



CANADA
4-H Ontario

www.4-hontario.ca

4-H ONTARIO PROJECT



Beef

REFERENCE MANUAL

THE 4-H PLEDGE

I pledge my Head to clearer thinking,
my Heart to greater loyalty,
my Hands to larger service,
my Health to better living,
for my club, my community and my country.

THE 4-H MOTTO

Learn To Do By Doing

4-H ONTARIO PROVINCIAL OFFICE

111 Main Street, Box 212
Rockwood, ON N0B 2K0
TF: 1.877.410.6748
TEL: 519.856.0992
FAX: 519.856.0515

EMAIL: inquiries@4-hontario.ca
WEB: www.4-HOntario.ca



PROJECT RESOURCE INFORMATION:

Updated by: Elizabeth Johnston, Megan Burnside-Poitras and Cam Crogie, 4-H Ontario
Cover Photo by: Elizabeth Johnston
Layout by: Mary Dunn
Date: March, 2018

Thank you to the 4-H Beef Project Advisory Committee members who assisted with the update of this resource:

Elaine Bowman – Beef Producer & Temiskaming 4-H Association
Dan Ferguson, Manager of Producer Relations, Beef Farmers of Ontario
Nancy Noecker, Beef Calf and Heifer Specialist, OMAFRA
Grace Oesch, Beef Producer & Perth 4-H Association
Megan Van Schaik, Beef Cattle Specialist, OMAFRA
Blair Williamson, Beef Producer & Lambton 4-H Association

4-H Ontario grants permission to 4-H Volunteers to photocopy this 4-H project resource for use in their local 4-H program.

All information presented in this Project Resource was accurate at the time of printing.

The development of this project resource was made possible through the support of Wayne and Barbara Nichols.

TABLE OF CONTENTS

Welcome to 4-H Ontario's Beef Project!	1
Introduction	
– Choosing A Club Project	12
Section 1 – Beef Basics	16
– Anatomy	17
– Beef Cattle Behaviour – Working Safely with Beef Cattle	27
– Animal Identification	38
– Code of Practice for the Care and Handling of Beef Cattle	46
– Transportation of Cattle	61
Section 2 – The Beef Farm	67
– Cattle Facilities	68
– Handling Facilities – Safe & Effective Handling	76
– Pasture Management	91
– Environment & Sustainability	125
Section 3 – Feeding the Herd	139
– Digestive System	140
– Nutrient Requirements for Beef Cattle	151
– Importance of Water	164
– Feeds for Beef	170
Section 4 – Herd Health	187
– Herd Health Planning	188
– Parasites	205
– Diseases of the Beef Animal	218
– Managing Your Market Animal	230
Section 5 – Beef Breeding & Reproduction	241
– Reproductive Systems	242
– Selecting & Raising Heifers	257
– Genetic Evaluation	267
– Frame Score & Estimating Finish Weight	279
– Breeding Season	289
– Pregnancy Checking	300
– Calving Season	309
Section 6 - Dollars and Sense (Marketing & Economics)	319
– Record Keeping	320
– History of the Beef Industry in Canada	327
– Cuts of Meat	332

– Beef Grading System	338
– Beef Value Chain	348
– Market Analysis – Cattle Cycle	355
– Tools for the Industry – Beef Marketing	360
Section 7 – Into the Showring	367
– Selecting A Project	368
– Clipping & Fitting	406
– Showing & Sportsmanship	434
– Engaging with the Public	458
– Beef Judging	482

WELCOME TO 4-H ONTARIO'S BEEF PROJECT!

The purpose of the 4-H Beef Project is to help members learn about the beef industry and how to properly care for beef cattle. By participating in the 4-H Beef Project, members can increase their knowledge of beef husbandry as well as improve their beef showmanship skills by learning basic safety handling principles. Members will learn about their own beef cattle if they have any, other beef breeds, safety, health, anatomy, behaviour, breeding and reproduction, nutrition, housing, handling facilities, transport, judging, conformation and showmanship.

Members will develop respect for beef cattle, responsibility in caring for beef cattle and discipline in the way beef cattle are handled. Members will also develop patience in training and neatness in both their own and their animal's appearance, a general respect for the beef industry and members will learn and grow personally as they participate in the many activities this project has to offer. There are several ways to participate in the beef project, even if a member doesn't own their own beef animal.

OBJECTIVES

1. To understand the history of the beef industry
2. To increase knowledge levels about the husbandry of beef cattle
3. To learn how to safely work with and around cattle
4. To learn about proper animal welfare and to be able to identify cattle related issues
5. To learn about the various breeds of beef cattle
6. To learn how to properly transport beef cattle
7. To increase knowledge about marketing and the financial viability of the beef industry
8. To engage youth to be advocates of a healthy beef industry
9. To learn about the elements of judging and public speaking
10. To learn the proper use of parliamentary procedure

HOW TO USE THIS MANUAL

THE REFERENCE BOOK:

The reference book is laid out into 8 sections:

Section 1 – Introduction

Section 2 – Beef Basics

Section 3 – The Beef Farm

Section 4 – Feeding the Herd

Section 5 – Herd Health

Section 6 – Beef Breeding & Reproduction

Section 7 -- Dollars and Sense (Marketing & Economics)

Section 8 – Into the Showring

Within each section are several units. Each unit could be used as a meeting. Use your own discretion as to which units are appropriate for the age and knowledge of the members in your club. There are more units than can be covered in 12 hours of a typical 4-H project. A member could take this project for multiple years and learn different content each year.

Each unit contains Setting Objectives, Suggested Learning Outcomes, Roll Call questions, a suggested agenda, Topic Information, Activities and a Digging Deeper section. Activities should be used in combination with the discussion of topic information to teach members in a hands-on, interactive learning environment.

INCLUDING STEM IN THE 4-H BEEF PROJECT

WHAT IS STEM AND WHY IS IT IMPORTANT?

Since 1915, 4-H in Ontario has engaged youth in science, technology, engineering, and math (STEM). This has traditionally meant a solid focus on agricultural science, mechanics, entrepreneurship, natural sciences and household science. Today, 4-H has grown to include rocketry, robotics, computer science, environmental sciences, and more. 4-H provides hands-on learning experiences to encourage learning about the world around us. Our lives are completely immersed in science and technology.

Understanding how science, engineering, and technology impact our lives, solve problems and create new ones makes it easier to navigate our modern world.

In school, science classes need to cover a broad range of topics in a limited amount of time while STEM in 4-H allows members and leaders time to dig deeper into ideas and concepts and to spend as much time as desired to work on projects based on personal interests, questions, and skills.

STEM in 4-H allows a person to work on their own questions, design their own tests, create their own models, build their understanding, and share their work with others – learn to do by doing. That's what science and engineering are, trying to understand the natural universe and develop solutions to the problems faced in our world today. Science is inquiry that uses a specific approaches and skills. But all learning is an inquiry process so working with science helps develop your learning muscles.

Within 4-H, the STEM process can go even further to include the Arts, thus changing the acronym to STEAM – Science, Technology, Engineering, Art & Math.

STEAM IN 4-H ONTARIO PROJECTS

As you work through the Beef Project, you will see STEAM integrated throughout the project within almost all of the activities provided. Examples of activities include 'A Stomach at Work, Pasta Skeleton of a Beef Animal, and The Cost of Feeding Beef Cattle,' amongst many others.

STEAM can be challenging but it can also be fun! Be sure to try out the activities. Observe what works and what doesn't and how activities can be changed slightly to get different results. It's all a part of the STEAM learning process.

PLANNING A MEETING

Plan your meetings well. Review all the information well in advance so you are prepared and ready!

BEFORE EACH MEETING:

- Read the topic information and activities and photocopy any relevant resources for the members' Record Books.
- Be familiar with the topic information for each meeting. Think of imaginative ways to present the information to the members. Do not rely on just reading the information out loud. Review available resources, plan the meetings and choose activities and themes that complement the ages and interests of your members. Gather any equipment and/or resources that will be needed to complete the meeting.
- At least 12 hours of club meeting time is required for every project; including club business, specific project information and social recreation. The delivery format for that material is left to the discretion of the leaders. Before each meeting, create a timeline to ensure that you are providing an adequate amount of instructional time for club completion. **Note:** the best practice recommendation is that a club have multiple meeting times for each project. Included on the following page is a Leader's Planning Chart to help with the planning of meetings. In addition to the chart, keep track of what went well and what could be changed next time. That way, each time this project is run, the content of the meetings can be different!

When planning each meeting, a typical 4-H meeting agenda should include the following:

- Welcome & Call to Order
- 4-H Pledge
- Roll Call
- Parliamentary Procedure:
 - » Secretary's Report
 - » Treasurer's Report (if any)
 - » Press Report
 - » New Business: local and provincial 4-H activities/opportunities, upcoming club activities
- Meeting content and activities
- Clean-up
- Social Recreation and/or refreshments
- Adjournment

JUDGING AND COMMUNICATIONS:

Each meeting must include either a judging or public speaking activity.

- Judging gives the members an opportunity to use judging techniques as part of the learning process. Through judging, members learn to evaluate, make decisions and communicate with others. They also develop critical thinking skills, confidence and self-esteem. Many examples are used in this reference book but use your imagination! As long as members are setting criteria and critically thinking about where items fit within that set of criteria, they are learning the basic skills of judging!
- A communications activity has been provided for each meeting but can be included in the Roll Call or social recreation time. These activities do not need to involve the topic of horses as the outcome is more about understanding the concepts of effective communication.

ELECTING YOUR EXECUTIVE

Elections can be chaired by a youth leader, senior member or club leader. The person chairing the elections is not eligible for any positions.

Procedure:

1. All positions are declared vacant by the chairperson, who indicates this by saying “I’d like to declare all positions vacant.”
2. The group decides on the method of voting (i.e. show of hands, ballot or standing).
3. The chairperson accepts nomination from members for each position being filled. Nominations do not require a seconder. Nominations are closed by motion or declaration by the chairperson.
4. Each member nominated is asked if he/she will stand for the position. Names of members who decline are crossed off.
5. Voting takes place by selected method and majority rules (i.e. member with most votes).
6. Announce the name of the successful member. Offer congratulations and thank all others that ran for the position.
7. If ballots are used, a motion to destroy the ballots is required and voted on.

STEPS IN MAKING A MOTION

The motion is a very important key to having good meetings. Motions are a way of introducing topics for discussion and allowing each member to speak and vote. Any member can make a motion.

Steps in Making a Motion:

1. Address the chairperson (i.e. raise your hand).
2. Wait for the chairperson to acknowledge you.
3. Make the motion: "I move that..."
4. Another person seconds the motion: "I second the motion."
5. Chairperson states the motion.
6. Chairperson calls for discussion of the motion.
7. Chairperson restates the motion.
8. Chairperson calls the vote: "All in favour? Opposed?"
9. Chairperson announces the result of the vote: "Motion carried" or "Motion defeated."

LEADER'S PLANNING CHART

Meeting #	Date/Place/ Time	Topics Covered	Activities	Materials Needed

As a club volunteer your responsibilities are to:

- Complete the volunteer screening process and to attend a volunteer training session.
- Notify the local association of the club, arrange a meeting schedule and participate in club meetings, activities and the Achievement program.
- Review the project material in the Reference and Record books to familiarize yourself with the information and adapt it to fit your group. Be well organized and teach the material based on your group's age, interest and experience level.
- Organize the club so members gain parliamentary procedure, judging and communication skills.
- Have membership lists completed and submitted along with fee collected (if applicable) by the end of the second meeting.
- Have members fill out a Participant Agreement Form and identify any health concerns. Ensure that all members, leaders and parent helpers know the appropriate actions during any emergency. Check with members for any food allergies or dietary restrictions and plan snacks accordingly.

As a club member your responsibilities are to:

- Participate in at least 2/3 of his/her own club meeting time. Clubs must have a minimum of 12 hours of meeting time.
- Complete the project requirement to the satisfaction of the club leaders.
- Take part in the project Achievement Program.
- Fill in and complete the Record Book.
- Complete any other project as required by the club leaders.

ACHIEVEMENT PROGRAM IDEAS/SUGGESTIONS

- If members have a project animal for this club, show the animal at a local fair/show.
- Host a beef information day and educate the public about the beef industry in the area. If possible, have cattle there for people to see and touch.
- Be a part of a local Farm Safety Day. Have a display about safety while working with beef cattle.
- Have members make a presentation at school about the 4-H Beef Project and/or their project animal.
- Create a skit about beef cattle and perform it at school, at a senior's home, at another organization's meeting, etc.

SPECIAL PROJECTS

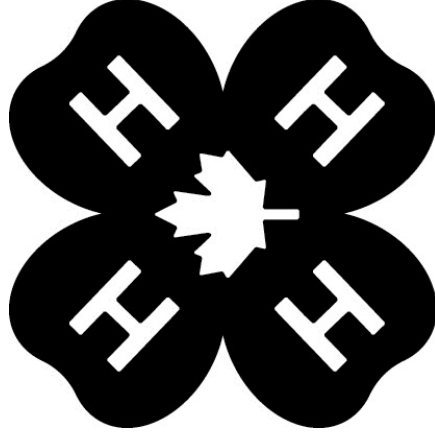
These projects are done outside of meeting time and are for members interested in doing more – often senior members. It's up to you as the leader to decide if you will require members to complete a Special Project for club completion. Some ideas include:

- Write a press release about the beef industry to your area.
- Visit a beef farm. Interview the owner or someone who works there and write a press release for the newspaper.
- Create a display about a topic related to beef cattle.
- Create a video about a topic related to the beef industry. Post on YouTube.

TOUR & GUEST SPEAKER IDEAS

- Visit a local beef farm. Have the owner or someone who works there give a tour and speak about the operation. Visit different types of farms (cow-calf, backgrounder, feedlot)
- Visit a cattle auction.
- Have guest speakers attend meetings to supplement the material in the Reference Manual. Speakers could include a beef farmer, veterinarian, beef nutritionist, feed salesperson, someone who works within the beef industry.
- Visit a local feed store and/or feed mill.
- Tour the University of Guelph Beef Research Centre near Elora.
- Attend the Royal Agricultural Winter Fair in Toronto.
- Attend a beef show at a local fair.

**I pledge my Head to clearer thinking,
my Heart to greater loyalty,
my Hands to larger service,
my Health to better living,
for my club, my community and my
country.**



CANADA
4-H Ontario

4-H BEEF PROJECT REFERENCES

4-H Alberta www.4h.ab.ca

4-H British Columbia <https://www.bc4h.bc.ca>

4-H Manitoba <https://4h.mb.ca>

4-H Saskatchewan www.4-h.sk.ca

Alberta Agriculture & Forestry <https://www1.agric.gov.ab.ca>

Beef Cattle Research Council www.beefresearch.ca

Beef Farmers of Ontario www.ontariobeef.com

Canada Beef <https://canadabeef.ca>

Canadian Beef Breeds Council www.canadianbeefbreeds.com

Canadian Beef Grading Agency www.beefgradingagency.ca

Canadian Cattle Identification Agency <http://www.canadaid.com>

Canadian Cattlemen’s Association www.cattle.ca

Canadian Centre for Food Integrity www.foodintegrity.ca

Canadian Encyclopedia www.thecanadianencyclopedia.ca

Canadian Food Inspection Agency <http://inspection.gc.ca>

Careers in the Beef Sector <https://beefcareers.ca>

Farm and Food Care Ontario www.farmfoodcareon.org

Government of Manitoba <https://www.gov.mb.ca/agriculture>

Government of Saskatchewan www.saskatchewan.ca

Judging Beef Cattle and Oral Reasons 101 <http://www.cals.uidaho.edu/edcomm/pdf/pnw/pnw669.pdf>

Manitoba Judging Beef Factsheet <https://www.gov.mb.ca/agriculture/rural-communities/4h/pubs/judge-beef-factsheet.pdf>

Merck Veterinary Manual <https://www.merckvetmanual.com>

Michigan State University Extension <http://msue.anr.msu.edu>

National Farm Animal Care Council <http://www.nfacc.ca>

Northampton County Centre – North Carolina State University – Preparing Your Show Calf https://northampton.ces.ncsu.edu/wp-content/uploads/2014/12/Show_Calf_Grooming.pdf?fwd=no

Ohio State University Extension http://www.geauga4h.org/beef/beef_body.htm

Ontario Ministry of Agriculture, Food & Rural Affairs (OMAFRA) Fact Sheets - Beef - www.omafra.gov.on.ca/english/livestock/beef

Ontario Corn Fed Beef Program www.ontariocornfedbeef.com

Sure Champ <http://surechamp.com>

University of Arkansas – Agriculture & Research Division - <https://www.uaex.edu/4h-youth/activities-programs/docs/Selecting%20Your%20Beef%20Cattle%20Project.pdf>

University of Guelph www.uoguelph.ca

INTRODUCTION

BEEF: CHOOSING A CLUB PROJECT

SELECTING A PROJECT:

There are a lot of beef project options for members, leaders and clubs to consider. Members should choose the project or projects they are most interested in, and that also are a good

fit for their knowledge/skill level, as well as the type of support available. Leaders and clubs should keep an open mind to new project ideas and help each member and their family to make a plan for successfully managing their beef project or projects.

Suggested Lesson Outcomes

- To have members choose a project/club that is of particular interest to him or her.
- To have members to learn about at least one aspect of the beef industry.
- To put more of a focus on learning about the beef industry with showing beef cattle being a secondary learning focus of the project(s).
- To offer a project whereby members do not have to have a project animal but can still learn about the beef industry.

Potential Projects Listing:

- Market Beef
- Heifer Project
- Two Year Old Cow with Calf Project & Three Year Old Cow with Calf Project
- Carcass Market Beef Project
- Beef Pen Project
- Learn About the Beef Industry (does not involve working with a project animal)

POTENTIAL BEEF CLUB PROJECTS

MARKET BEEF

This project involves raising a steer or heifer for show and slaughter.

- Members will select, manage, care for and market a steer or heifer.
- Members learn about at least one aspect of the beef industry. Aspects include, but are not limited to safety, beef basics (including breeds, behaviour, transportation and codes of practice), housing, nutrition, herd health, breeding & reproduction and marketing.
- Members show their Market Beef Project at the club's Achievement Day. It is up to the club's discretion as to how the project animal is marketed.

HEIFER PROJECT

The Heifer Project involves raising a heifer for show and cattle production,

- Members will select, breed, manage, care for and potentially market a beef heifer calf.
- Members learn about at least one aspect of the beef industry. Aspects include, but are not limited to safety, beef basics (including breeds, behaviour, transportation and codes of practice), housing, nutrition, herd health, breeding & reproduction and marketing.
- Members show their Heifer Project at the club's Achievement Day and may market their project animal after this or continue showing throughout the rest of the season.

Note: Members may retain the heifer; have the heifer bred and carry it forward for the Two Year Old Cow with Calf Project.

TWO YEAR OLD COW WITH CALF PROJECT & THREE YEAR OLD COW WITH CALF PROJECT

These projects are a continuation of the Heifer Project to a mature animal for cattle production.

- Members will manage, care for and potentially market a beef cow and/or calf.
- Members learn about at least one aspect of the beef industry. Aspects include, but are not limited to safety, beef basics (including breeds, behaviour, transportation and codes of practice), housing, nutrition, herd health, breeding & reproductions and marketing.
- Members are to show the cow and calf pair at the club's Achievement Day.

Talk about it!

Which type of beef project will work the best for your club?

Communicate it!

What experience do you have working with beef cattle? What type of beef cattle have you worked with? (i.e. beef calves, stockers, feedlot, show heifers, cow-calf)

Look it up!

What traits do you like to see in a beef animal? Which breed do you think will give you most, if not all, of these traits?

Share it!

Have members share what they found with the group.

Note:

- For the Two Year Old Cow with Calf Project, the cow must have been a registered Heifer Project the previous 4-H year to be carried forward for this project.
- For the Three Year Old Cow with Calf Project, the cow must have been a registered Two Year Old Cow with Calf Project to be carried forward for this project.

CARCASS MARKET BEEF PROJECT

The Carcass Market Beef Project involves raising a steer or heifer for slaughter and carcass evaluation.

- Members will select, manage and care for the carcass project steer or heifer until it goes to slaughter. Additionally, they will market the carcass.
- Members will learn about at least one aspect of the beef industry. Aspects include, but are not limited to safety, beef basics (including breeds, behaviour, transportation and codes of practice), housing, nutrition, herd health, breeding & reproduction and marketing.
- A display on the Carcass Market Beef Project is to be featured at the club's Achievement Day.

It is up to the club's discretion as to how the project animal is marketed.

BEEF PEN PROJECT

The Beef Pen Project is intended for experienced beef project members interested in advanced cattle and beef production.

- Members will select, manage and care for three or more beef animals for breeding or private sale, in addition to developing a business plan for their project.
- Members learn about at least one aspect of the beef industry. Aspects include, but are not limited to safety, beef basics (including breeds, behaviour, transportation and codes of practice), housing, nutrition, herd health, breeding & reproduction and marketing.
- Members may conduct a tour of their operation and create a display as part of their Achievement Day or another activity at the discretion of the club leaders.

LEARN ABOUT THE BEEF INDUSTRY PROJECT

The Learn About the Beef Industry Project is intended for members to learn about the beef industry without owning/having a project animal.

- Members will learn about all aspects of the beef industry including housing, nutrition, herd health, breeding & reproduction and marketing both of animals and of beef after it has been processed.
- Members can choose one of the following options or an option of their choice at the discretion

Check it out at home!

Research and find out how many dollars the beef industry contributes to the Canadian economy.

Record your findings and be prepared to share them at the next meeting.

of the club leaders for their Achievement Day:

- » Create a mock beef farm (cow-calf, background or feedlot) and present how the farm will be set up, who/how it will be managed and a business plan for the farm
- » Create an auction catalogue for a beef sale
- » Create a presentation on the beef industry outlining the journey from the time a calf is born until the beef reaches the consumer

BEEF BASICS



SECTION 1A: ANATOMY

SETTING OBJECTIVES:

An understanding of basic anatomy is important in making daily decisions about feed, housing, health and breeding.

Suggested Lesson Outcomes

- To be able to identify the external anatomy of a beef animal
- To be able to identify the bones in the bovine skeletal system
- To have an understanding of why it is important to know the anatomy of a beef animal

ROLL CALLS

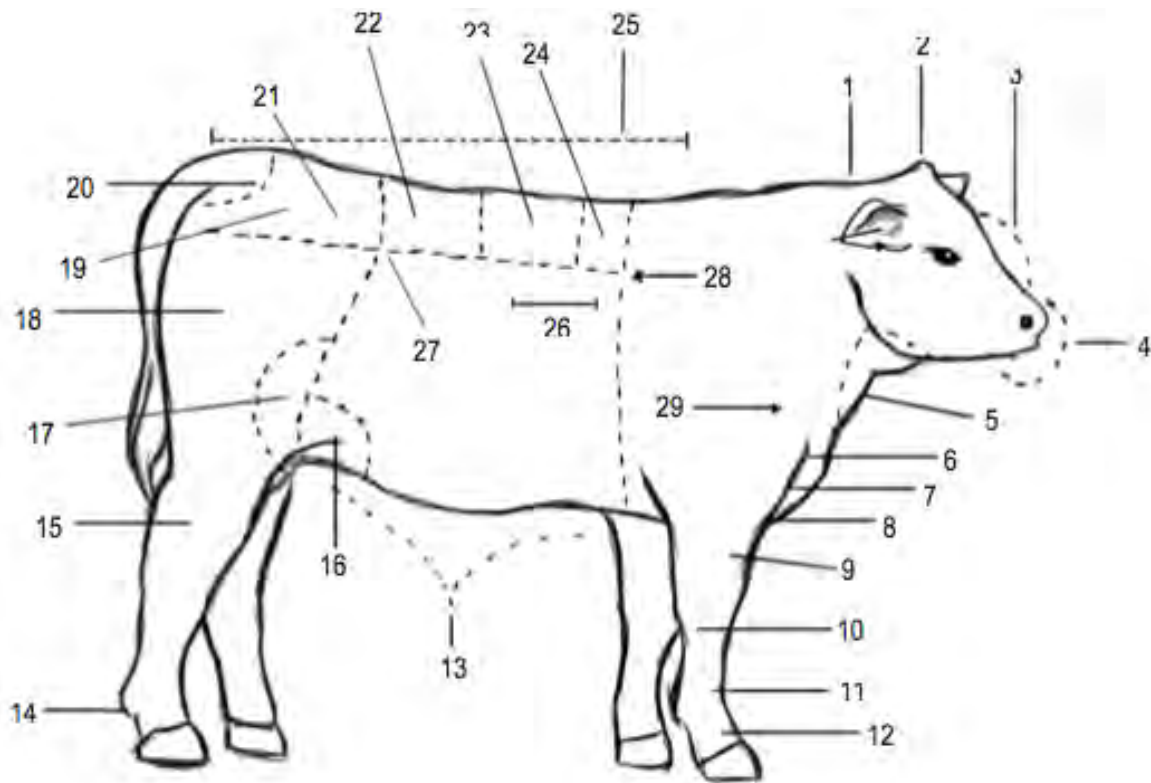
- Name one external part of a beef animal.
- Name a bone in the bovine body.
- Why is it important to understand the bovine skeletal system?

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information External Anatomy of Beef Cattle Skeletal System of Beef Cattle Activity #1 External Anatomy of Beef Cattle Activity #2 Pasta Skeleton of a Beef Animal Activity #3 Skeletal System of Beef Cattle	30 min + Activities
At Home Activity	Bovine vs. Human Skeletal System	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

EXTERNAL ANATOMY OF BEEF CATTLE



- | | | | | |
|--------------------------|----------------|-------------------|---------------|-----------------|
| 1. Crest | 7. Brisket | 13. Underline | 19. Pin Bone | 25. Topline |
| 2. Poll | 8. Chest Floor | 14. Dew Claw | 20. Tail Head | 26. Ribs |
| 3. Face | 9. Forearm | 15. Hock | 21. Rump | 27. Hooks |
| 4. Muzzle | 10. Knee | 16. Flank | 22. Loin | 28. Heart Girth |
| 5. Dewlap | 11. Shank | 17. Stifle Region | 23. Back | 29. Shoulder |
| 6. Point of the Shoulder | 12. Pastern | 18. Quarter | 24. Crop | 30. Ear |

Credit: 4-H Alberta

Check It Out!

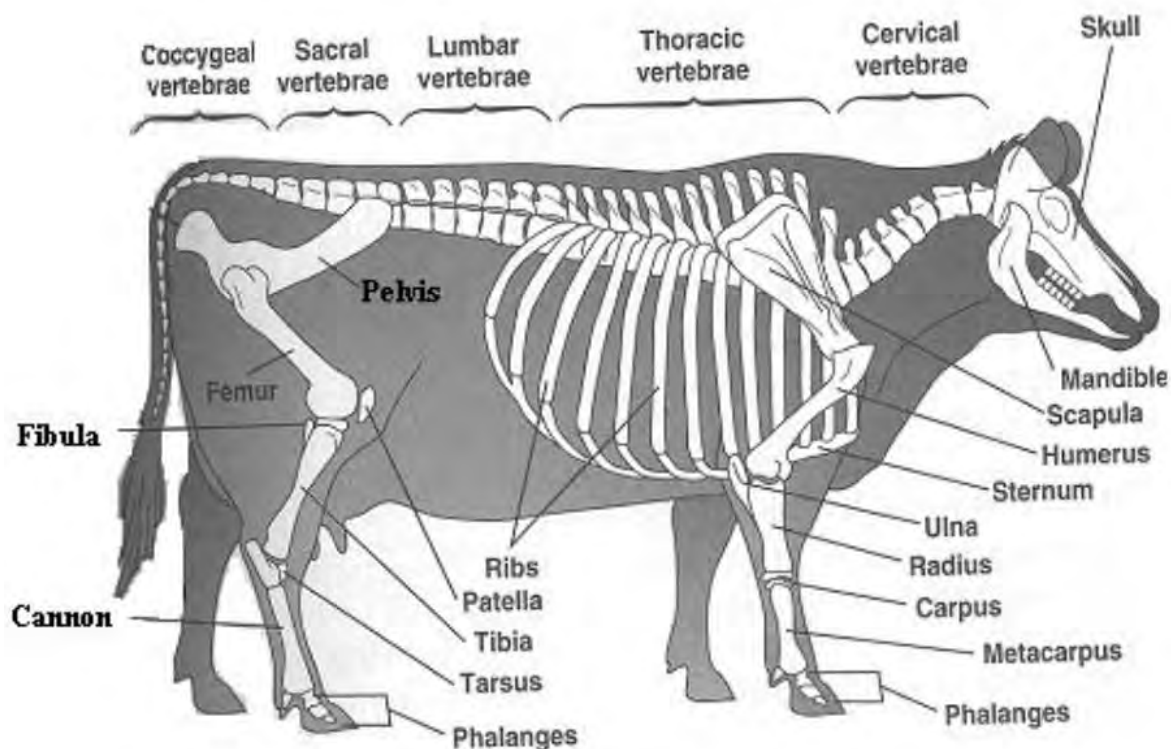
Visit http://www.geauga4h.org/beef/beef_body.htm for an interactive activity to learn the various parts of the external anatomy of a beef animal courtesy of Ohio 4-H.

Do It!

Using a quiet beef animal and sticky notes, (each sticky note with the name of an external part of the body), label the animal with where you think each part would be found on the animal. Work as a group with the entire group having to agree on where the sticky note should be placed.

If a live animal is not available for this activity, use an outline of a beef animal on a piece of Bristol board and have 4-H members label the outline.

SKELETAL SYSTEM OF BEEF CATTLE



Cow Skeleton

Credit: <https://www.bing.com/images>

The skeletal system is one of the systems that make up any animal body. It is the framework on which the body is built and supports the weight of all the other systems. The skeletal system includes bones, muscles, the joints that connect bones, ligaments which allow movement in the joints and cartilage. The skeletal system is also fundamental to the movement of the body.

An understanding of the basics of the skeletal system ensures that owners and handlers provide cattle with appropriate nutrition, exercise and living conditions for optimum skeletal health.

The cow's skeletal system from the front legs to the head includes the cannon, knee joint, radius, sternum, elbow joint, ulna, humerus, shoulder joint, shoulder blade and eye socket. From the top of the head and along the top side of the cow, the skeletal system includes the horn cones, cervical vertebrae, dorsal vertebrae, lumbar vertebrae, sacrum and hip bone.

Along the back side of the cow, the cow's skeletal system includes the femur, knee joint, tibia, hock joint, ribs, pasterns and coronary. These are the major components of the cow's skeletal system.

Structural soundness refers to the skeletal system and how well its bones support the animal's body. Structural soundness affects an animal's well-being, movement and reproductive efficiency.

Do It!

Using a quiet beef animal and sticky notes, (each sticky note with the name of a bone in the bovine skeleton), label the animal with where you think each bone would be found on the animal. Work as a group with the entire group having to agree on where the sticky note should be placed.

If a live animal is not available for this activity, use an outline of a beef animal on a piece of Bristol board and have 4-H members label the outline.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about beef anatomy through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

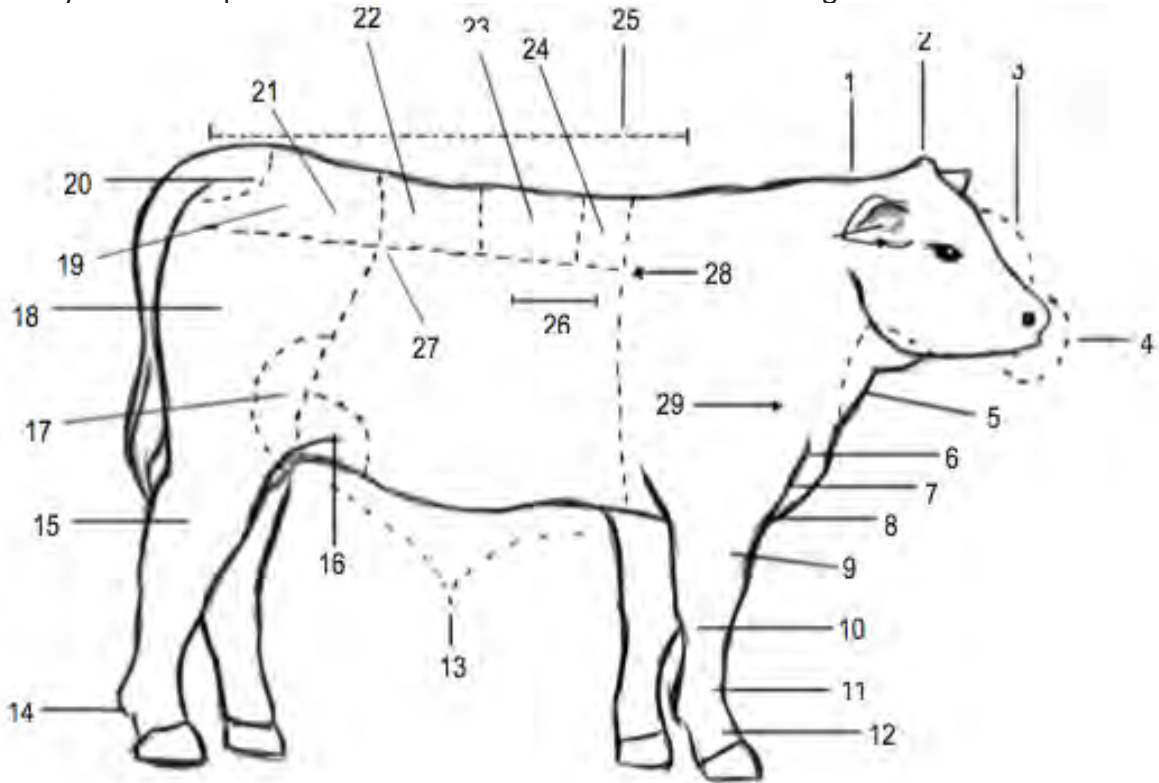
ACTIVITY #1
EXTERNAL ANATOMY OF BEEF CATTLE

<p>DO</p>	<p>Time: 20 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> - Anatomy of Beef Cattle worksheet - Writing utensil <p>Instructions:</p> <ul style="list-style-type: none"> - Give each member an Anatomy of Beef Cattle worksheet - Explain the worksheet and have members fill in the blanks to identify the parts of the animal - Review the worksheet to ensure that all members have the animal labelled correctly
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To allow members to identify and understand the various parts of a beef animal as they progress in their knowledge of cattle so members are better equipped to learn about topics such as diseases, frame score and conformation.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Why is it important to know and understand the anatomy of beef cattle? - Was it easy or hard to fill out the worksheet? - Are there any other parts of the anatomy that are not labelled on the diagram?

ACTIVITY #1 WORKSHEET

EXTERNAL ANATOMY OF BEEF CATTLE

Correctly match the parts of the animal to their location on the diagram.



- | | | |
|-----------------|---------------------------|-------------------|
| ___ Poll | ___ Chest Floor | ___ Dew Claw |
| ___ Tail Head | ___ Ribs | ___ Topline |
| ___ Pin Bone | ___ Underline | ___ Brisket |
| ___ Crest | ___ Point of the Shoulder | ___ Pastern |
| ___ Quarter | ___ Crop | ___ Ear |
| ___ Shoulder | ___ Back | ___ Stifle Region |
| ___ Shank | ___ Dewlap | ___ Muzzle |
| ___ Knee | ___ Flank | ___ Loin |
| ___ Heart Girth | ___ Hooks | ___ Rump |
| ___ Hock | ___ Forearm | ___ Face |

Credit: 4-H Alberta

ACTIVITY #2
PASTA SKELETON OF A BEEF ANIMAL

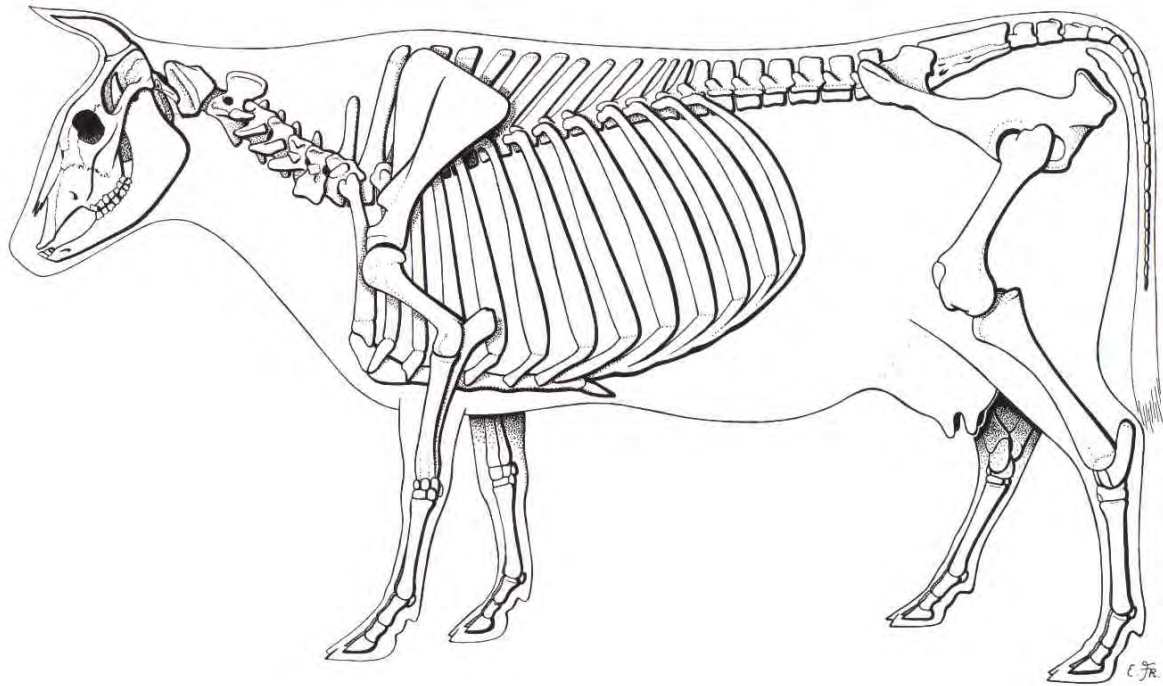
DO	<p>Time: 40 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> - Pasta – various shapes and sizes - Hot glue - Pipecleaners and/or straws - “googly” eyes - Paper plates - Adhesive labels - Other creative resources of your choice <p>Instructions:</p> <ul style="list-style-type: none"> - Examine skeletal drawings from the meeting, a textbook, the Internet, etc. looking at multiple views . - Evaluate the pasta shapes that are provided. - Construct the frame of the animal making it as lifelike and comprehensive as possible. - Label the skeletal structure. Try to label at least 20 different bones.
REFLECT	<p>Learning Outcomes:</p> <p>To allow members to witness and experience first-hand the anatomical structure of the beef animal and how skeletal features correspond to movement & agility.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Is the form of the skeleton correct compared to the pictures of the beef animal? - Has the skeleton been built to the right proportions of a beef animal? - Does the form show all of the flexible points on the beef animal? - Is the form stable? Can the structure support itself? - Does the structure show creativity and eye appeal?

ACTIVITY #3
SKELETAL SYSTEM OF BEEF CATTLE

DO	<p>Time: 20 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">– Skeletal System of Beef Cattle worksheet– Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">– Give each member Skeletal System of Beef Cattle worksheet– Explain the worksheet and have members label the bones of the beef animal– Review the worksheet to ensure that all members have the animal labelled correctly
REFLECT	<p>Learning Outcomes:</p> <p>To allow members to identify and understand the various bones of the beef animal as they progress in their knowledge of cattle so members are better equipped to learn about topics such as diseases, frame score and conformation.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">– Why is it important to know and understand the skeletal structure of beef cattle?– Was it easy or hard to fill out the worksheet?– Are there any bones that are not labelled on the diagram?

ACTIVITY #3 WORKSHEET SKELETAL SYSTEM OF BEEF CATTLE

Correctly label the bones on the beef animal.



Cannon

Carpus

Cervical Vertebrae

Coccygeal Vertebrae

Femur

Fibula

Humerus

Lumbar Vertebrae

Mandible

Metacarpus

Patella

Pelvis

Phalanges

Radius

Ribs

Sacral Vertebrae

Scapula

Skull

Sternum

Tarsus

Thoracic Vertebrae

Tibia

Ulna

AT HOME ACTIVITY

Look at the list of bones found in the bovine skeletal system. Then, going online or looking it up in a book, find a list of the bones found in the human skeletal system. Make a list of the bones that both cattle and humans have in common.

DIGGING DEEPER

For Senior Members

Broken legs in full-grown mature cattle almost never end well. But what if a beef calf gets a broken leg? Investigate what procedures a veterinarian might do to fix the leg and if possible, find out the cost of these procedures.

SECTION 1B: BEEF CATTLE BEHAVIOUR - WORKING SAFELY WITH BEEF CATTLE

SETTING OBJECTIVES:

Cattle are large animals and can be very dangerous, especially when those handling cattle do not understand why cattle react the way they do in certain situations. Members need to understand cattle behaviour as well as safe and effective methods of cattle handling so they, and others around them, are able to stay safe as well as provide as safe as possible environment for the cattle they are working with.

Suggested Lesson Outcomes

- To understand why cattle behave the way they do
- To discover the reasons why cattle see, move and react the way they do.
- To learn what personal protective equipment is needed when handling beef animals.

ROLL CALLS

- Why is it important to understand cattle behaviour?
- Name one thing a good cattle handler does when working with cattle.
- Name one piece of personal protective equipment that a beef farmer should wear.

SAMPLE MEETING AGENDA

Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Cattle Behaviour How Cattle See Flight Zone Personal Protective Equipment Activity #1 Cattle Eyesight Activity #2 Personal Protective Equipment (PPE) Relay Race	40 min + Activities
At Home Activity	Injuries When Working with Beef Cattle	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

CATTLE BEHAVIOUR

By understanding cattle behaviour, producers can adapt their handling methods accordingly. Like humans, cattle are more likely to remain calm if those who are dealing with them remain calm.

Here are some things every good cattle handler should know:

- Cattle like to travel in pairs or in three's. They don't like to be alone. Cattle are social animals.
- Cattle have a strong herd instinct to follow the leader and are more likely to move if they can see others ahead of them. If you can get the first animal to move through a gate or chute, others will follow.
- Cattle move naturally in a circular manner and will stop if they seem to be approaching a dead end or a sharp turn.
- Cattle respond negatively to non-uniform light or shadows and to sudden movement or noises from people or objects.
- Cattle move at their own speed. Pushing or prodding or yelling only agitates them and makes them more difficult to handle.

Cattle have long memories. If the last time through a handling system was rough, or they received a vaccination or injection, they may be more stressed or difficult to handle the next time through.

Check It Out!

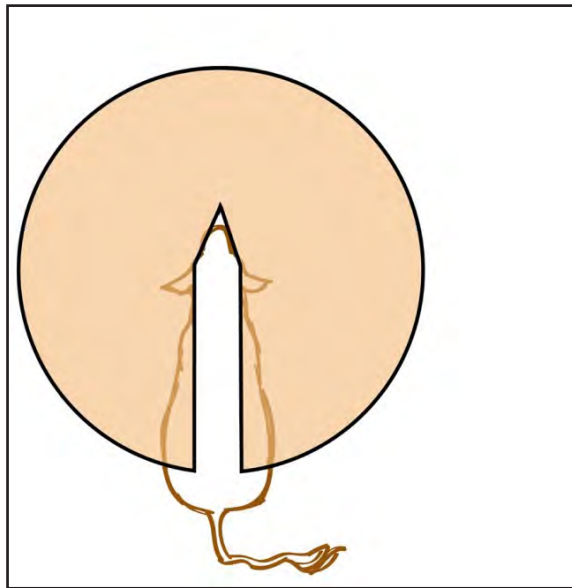
Dr. Grandin is a world renowned designer of livestock handling facilities and a Professor of Animal Science at Colorado State University.

Facilities she has designed are located in the United States, Canada, Europe, Mexico, Australia, New Zealand, and other countries. In North America, almost half of the cattle are handled in a center track restrainer system that she designed for meat plants. Curved chute and race systems she has designed for cattle are used worldwide and her writings on the flight zone and other principles of grazing animal behavior have helped many people to reduce stress on their animals during handling.

To learn more about Dr. Temple Grandin's work on livestock behaviour, design of facilities and human animal processing visit: <http://www.grandin.com/>

HOW CATTLE SEE

The physical limitations and the natural behaviours of cattle should be kept in mind at all times for safe, low-stress and effective handling. Doing so will result in a reduced risk of stress and injury for both the animal and the producer. One thing that's important to understand is that cattle see very differently than humans, and have certain vision limitations. Cattle's eyes are located on the sides of their head, giving them excellent wide-angle vision.



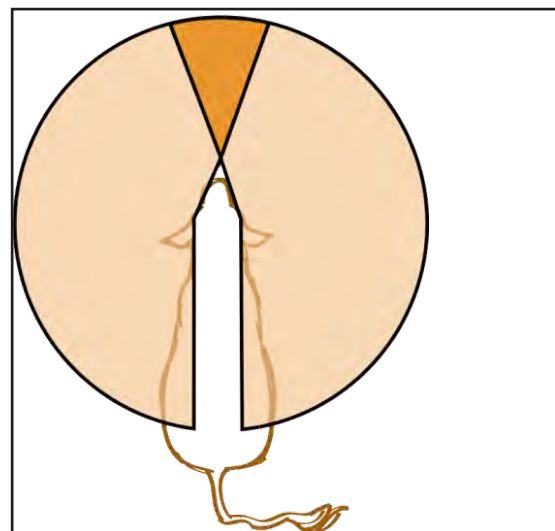
Cattle Sight – Wide-Angle Vision

Credit: 4-H Alberta Beef Project

The downside of cattle having wide-angle vision is that their lack of depth perception at ground level when walking with their heads up. So in addition to having a hard time seeing what's behind them, there's only a very small area directly in front of them that cattle can clearly see. This may explain why cattle balk at distractions such as a sudden change in floor level or texture, loud noises, flapping objects, unfamiliar smells as well as contrasting shadows, patterns and light.

POINT OF BALANCE

When handling cattle, producers keep the vision limitations of cattle in mind and take care to position themselves so that the animal is able to see them. Producers use the point of balance, which is usually in line with the animal's shoulder, to move cattle with ease. Cattle move forward or backwards depending on the position of the handler in relation to the animal's point of balance.

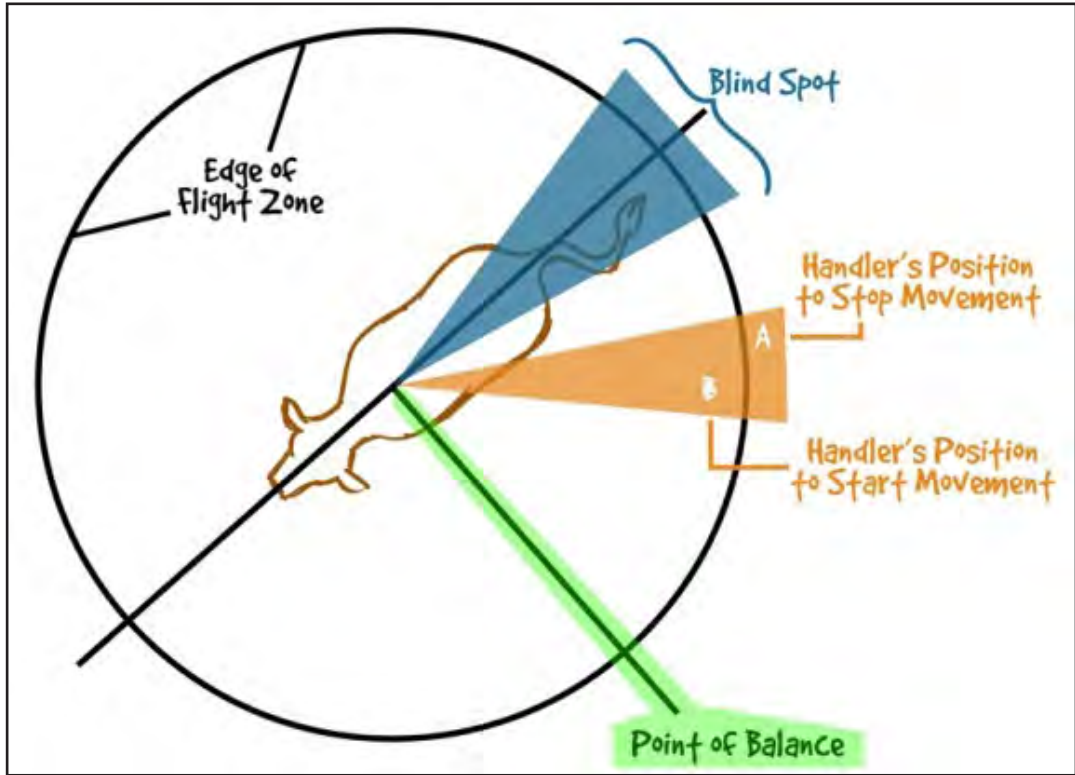


Cattle Vision – Depth Perception

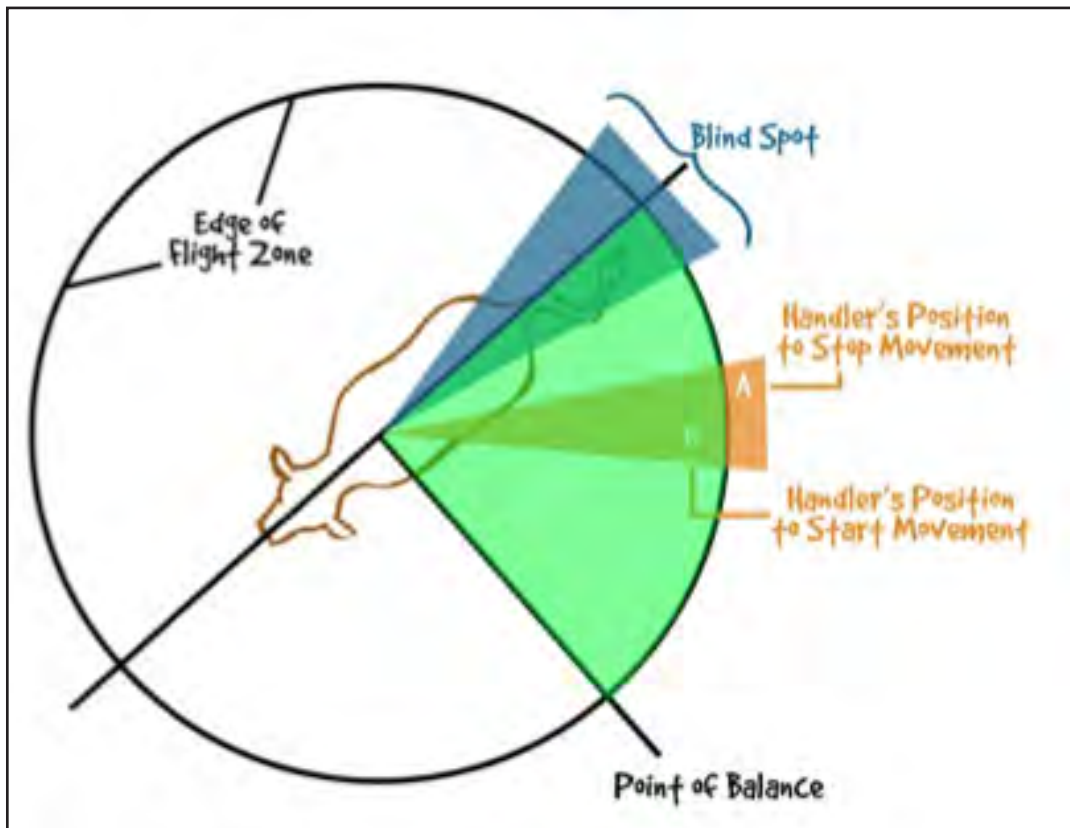
Credit: 4-H Alberta Beef Project

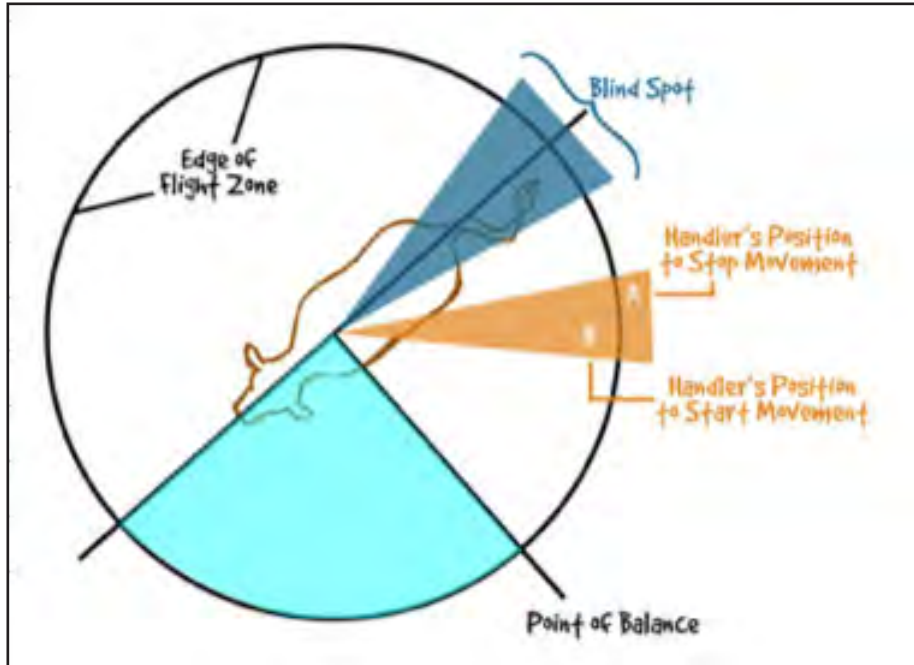
Experience It!

If time permits, watch the HBO film entitled Temple Grandin, made in 2010. This movie received 15 Emmy Award nominations and won five, including the Emmy for outstanding made for television movie and best actress in a drama (Claire Danes). The movie is a biopic of Dr. Grandin, who is autistic and who has become one of the top scientists in the humane livestock handling industry.



Cattle will move forward when the handler stands behind the point of balance.





Cattle will move backwards when the handler stands in front of the point of balance.

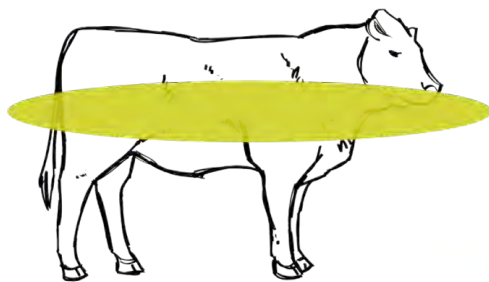
Groups of cattle in a chute will often move forward when the handler walks past the point of balance in the opposite direction of each animal in the chute – no prodding necessary.

Credit – Point of Balance diagrams: 4-H Alberta Beef Project

FLIGHT ZONE

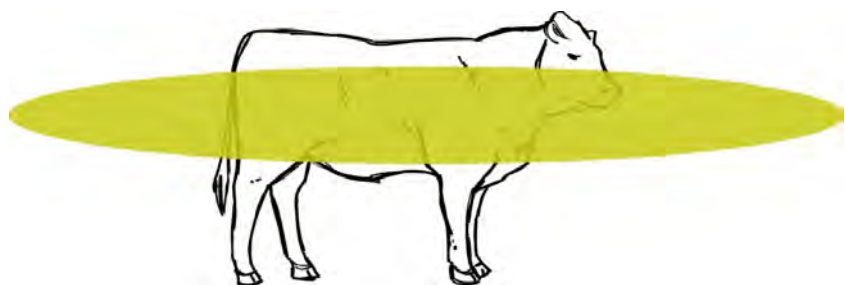
Think of the animal's flight zone as a human would of their own personal space. If a stranger stood too close to a human, they would most likely feel uncomfortable and move away. The same principle can be applied to cattle - if someone or something unfamiliar enters their flight zone they will move away.

Every animal has a flight zone, but the size of it will vary between animals and situations. If the animal is familiar with its surroundings and the person approaching, the flight zone decreases or disappears and the handler will be able to get closer to the animal.



Credit – Flight Zone: 4-H Alberta Beef Project

If the animal feels threatened or scared or if it is approached head-on, its flight zone increases in size and the animal will move sooner.



Experience It!

Invite an experience cattle handler to a meeting to discuss working with cattle. Alternately, have this person give a tour of a cattle facility and demonstrate cattle movement and point of balance.

The flight zone typically decreases when an animal is in a single-file chute, but if the animal rears in the chute, back off. Handlers who understand the concepts of point of balance and flight zone will be able to move animals with greater ease.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- When handling animals, farmers can protect themselves by using the appropriate personal protective equipment. Here are some considerations when it comes to PPE.

Footwear

- Safety footwear is especially important around large animals where there is a possibility of having a foot stepped on.
- Western boots or closed toe shoes with non-slip soles are ideal.

Clothing

- Choose fitted clothing. Clothing that is too loose may become tangled or get caught on something.
- Remove watches or loose jewelry before working with cattle.

Lung Protection

- Protect lungs with a dust mask or respirator when there are dusty conditions.

Skin Protection

- Long sleeved shirts and pants can protect individuals treating livestock that may be infected with disease.
- It is also important to be protected from sun damage by wearing sunscreen, sunglasses and a brimmed hat.

Work Gloves

- Work gloves can prevent cuts and scrapes. Work gloves are also important to protect hands while halter training.
- When administering medications or during activities such as tattooing it is beneficial to wear latex or silicone gloves.

Goggles or Face Shield

- Eyes are very vulnerable to injury. Eye protection with goggles or a face shield is important for preventing damage due to an object or chemical getting into one's eye.

Research It!

Workplace Safety & Prevention Services (WSPS) is now the health and safety provider for the agriculture industry sector in Ontario. <http://www.wsps.ca/Farm-Safety-Training/Farm-Safety.aspx>

Each year a number of injuries and fatalities are due to working with livestock. Check out this organization's website for up- to-date resources on safety prevention.

Sharps Container

- Be sure to always handle sharp materials with care. Separate sharp materials from other waste as soon as you're done with them, then dispose of them safely.

Always have the emergency address (also called the 911 address) of the premise posted so help can be called for quickly if needed.

–

Judge It!

Choose any type of PPE and find 4 of that type of PPE so that members can compare and rank the 4 items based on criteria that is set out by the group. This could be criteria such as quality of the item, cleanliness, appropriateness for the task at hand and safety level that the item provides.

Discuss It!

What personal protective equipment is used on your farm when working with beef cattle?

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about cattle behaviour through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

**ACTIVITY #1
CATTLE EYESIGHT**

<p>DO</p>	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">- Goggles with solid sides- Vaseline- Paper & Marker <p>Instructions:</p> <ul style="list-style-type: none">- Smear Vaseline on the outside of the viewing area of the goggles- Have a 4-H member put the goggles on.- Stand about 5 metres away from the 4-H member and ask them to read what is on the paper. Have several papers with a different word on each paper.- Have each member take a turn at wearing the goggles and trying to read the words.- If members are finding it too easy/too difficult to read the words, adjust the distance between the member and the person holding the papers with words on them.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To allow members to experience what it is like to look through the eyes of cattle.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Was it easier or more difficult to see through the goggles?- How does this affect how you might act when working around cattle?- Would this make it easier to scare cattle when working with them? How would their eyesight affect cattle when they're on pasture? In a barn with no natural lighting?

ACTIVITY #2

PERSONAL PROTECTIVE EQUIPMENT (PPE) RELAY RACE

<p style="text-align: center; font-size: 2em; color: white;">DO</p>	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> - Various personal protective equipment (PPE) items (an even number of each item) **see list above in meeting information - Ropes for starting line - Various items for an obstacle course <p>Instructions:</p> <ul style="list-style-type: none"> - Divide members into two teams. - Set up two identical obstacle courses. - Have members line up behind the starting line. Have the PPE in a pile (or in a box) at the starting line for each team. - After someone says 'Go', the first person on each team has to put on all of the PPE and then go through the obstacle course. When they return back to the starting line, the next person on the team puts on all of the PPE and goes through the obstacle course. This keeps on repeating until everyone on the team has taken a turn. - The first team to have everyone complete the obstacle course wins.
<p style="text-align: center; font-size: 2em; color: white;">REFLECT</p>	<p>Learning Outcomes:</p> <p>To allow members to become familiar with the personal protective equipment needed for working with cattle in a fun activity.</p>
<p style="text-align: center; font-size: 2em; color: white;">APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Was it easy or hard to get the equipment on quickly and then manoeuver through the course while wearing it? - Are there any other pieces of PPE that should be worn when working with cattle that weren't a part of the activity? - Has anyone in the group ever been hurt while working with cattle that the PPE would have helped to prevent?

AT HOME ACTIVITY

Do you know someone who has been injured when working with beef cattle? If they are willing to talk about it, ask them how it happened, how badly they were injured and if there is something that they have/would do differently the next time when working with cattle. Be ready to share your findings at the next meeting.

DIGGING DEEPER FOR SENIOR MEMBERS

Each year there are people hurt when working with cattle and unfortunately, some of those injuries are fatal. Research to find the latest statistics in Ontario (or in Canada if Ontario statistics are unavailable) for injuries and deaths related to livestock and more specifically, injuries and deaths related to cattle.

SECTION 1C: ANIMAL IDENTIFICATION

SETTING OBJECTIVES:

Agriculture is a global industry and with that comes the chance for animal diseases to spread quicker and to locations where the disease has not been seen before. Traceability systems need to be in place to be able to quickly contain disease outbreaks to ensure the health of our Canadian food system.

Suggested Lesson Outcomes

- To understand what RFID tags are and their importance
- To be able to know how to properly apply tags in the ears of cattle
- To understand what Premise ID and how this affects those in the beef industry

ROLL CALLS

- Why do we need a traceability system in Canada?
- Name an acceptable method of identifying cattle in Canada.
- Do you know what the identification number is of your project animal?

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Identification Tags & Traceability Premise ID	30 min + Activities
At Home Activities	Traceability Cost of RFID Tags	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

IDENTIFICATION TAGS AND TRACEABILITY

RADIO FREQUENCY IDENTIFICATION TAGS



Credit: Canadian Food Inspection Agency (CFIA) <http://inspection.gc.ca>

Radio Frequency Identification tags (RFID tags) are applied to the ears of beef cattle to assist with the identification and traceability of the animal. As shown in the picture, all CCIA-approved RFID ear tags intended for use on beef cattle are yellow in colour and carry the registered CCIA trademark – a $\frac{3}{4}$ maple leaf and “CA” letters. Each RFID tag has a written and electronically pre-programmed number that is associated with the animal wearing it, much like a license plate on a truck. Each animal’s number acts as a unique and accurate identifier. The tag can be read visually, or it can be scanned through the use of radio frequency technology using hand-held or panel readers.

When a beef producer purchases RFID tags, the numbers associated with each package of ear tags are assigned to that individual’s CCIA account. Those tags are only to be used for cattle within the care and control of that CCIA account holder. This ensures all cattle can be traced back to their farm of origin, should the need arise.

Approved tags are sold across Canada at the same locations where producers currently purchase farm supplies. In addition to farm supply stores across Canadian Cattle Identification Agency (CCIA) offers a direct-to-producer non-breed specific beef tag order web store.

Reach Out!

Invite a Canadian Food Inspection Agency (CFIA) inspector to your meeting to discuss the importance and use of RFID tags in cattle.

RFID Tags and Traceability

The beef industry is committed to protecting animal health, public health and food safety and traceability is the key to that. The Canadian Food Inspection Agency (CFIA) regulates and enforces animal identification, while the (CCIA) administers the identification program and manages the national Canadian Livestock Tracking System (CLTS) database.

The CLTS database allows producers to record tag information that relates to the three pillars of traceability: animal identification, premise identification and animal movement. This way, instances of serious animal health, public health or food safety concerns can quickly and easily be traced and contained. Producers can also enter value-added information, like age verification details, into the CLTS.

It is a federal requirement that all beef cattle raised in Canada be tagged with an approved CCIA RFID ear tag prior to leaving the farm they were born on, also called their “herd of origin.” These tags prove valuable in the event of an animal disease outbreak or natural disaster, and play an important role when it comes to customer assurance and effective herd management.

Management Tags

In addition to RFID tags, many producers also use management tags with a number and colour of their own choosing for easy identification within their own herd. They are particularly useful when identifying the animal in a pasture or pen as they can be read visually from a distance, eliminating the need to run the animal through the chute to get close enough with a RFID tag reader.



Credit: 4-H Alberta Beef Project

Applying RFID Tags

Placing the tag within the first $\frac{1}{4}$ of a beef animal's ear between the two ribs is best. Doing so minimizes the risk of bleeding, infection as well as the tag catching on something and being pulled out of the animal's ear. Be sure to follow the manufacturer's directions to ensure the tags stay on. Correct placement is also important for easy scanning.

Check It Out!

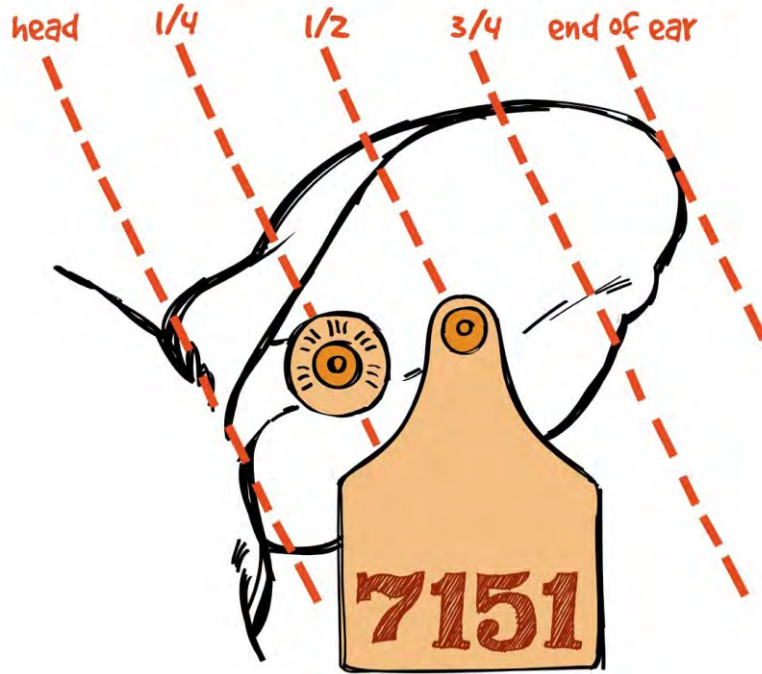
As the Canadian Government continually works to improve traceability processes in order to protect the health of Canada's livestock industry as well as the health of humans, there will be changes and updates to the Canadian livestock traceability system. Visit the CFIA, CCIA, Health Canada and Beef Farmers of Ontario websites to find out what the latest regulations and requirements are so you are informed and up to date.

Judge It!

Have four different types of management tags on display. Discuss what characteristics a good management tag should have and then have members judge the tags and give reasons for their placements.

Applying Management Tags

Insert in a similar manner, within the first $\frac{1}{2}$ the same ear or the other ear.



Credit: 4-H Alberta Beef Project

Experience It!

Visit a beef farm or cattle processing facility to see the tags being applied. Ask to see the tags and the tag applicator up close.

Share It!

What system do you use on your farm for animal identification?

Why is tag retention and readability important?

Best practices that optimize tag retention and position ear tags so they can easily be read electronically are important for the following reasons:

- Reducing the number of animals that require re-tagging keeps costs down and information current.
- Correct tag placement supports efficient electronic tag reading or scanning as animals move by panel readers set up along alleyways or chutes in operations like auction markets and feedlots. This can also be achieved by using handheld readers in chutes and squeezes.

Correct placement of RFID tags in animals' ears generally allows both panel and handheld readers to scan RFID tags efficiently. For example, an RFID tag attached to the very top edge of an animal's ear often causes the animal's ear to droop and the tag to lie sideways. When this happens, panel readers may not read the tag, resulting in the additional work of splitting the animal off so its tag can be read manually. This takes extra time and effort, and may impose additional stress and shrink on the animal.

The information linked to an animal's unique CCIA-approved RFID ear tag number is only valuable if the tag stays on the animal throughout its lifespan. This information has great value in the event of an emergency, as well as for customer assurance. Properly tagged animals are the key for Canada's traceability system.

Tips for Making Sure Tags Stay Put

- Properly restrain the animal so it cannot move its head while you are applying the tag.
- Use the recommended tag applicator and pin for the specific tag type and brand, and follow the manufacturer’s directions.
- Make sure the tags and applicators are clean.
- Wipe clean and disinfect both sides of the animal’s ear before applying the tag.
- Apply antiseptic to tags and tag applicator between tagging different animals. This will help to control infection.
- Do not apply a new tag in a hole from a previous tag.
- If possible, tag animals in moderate temperatures.
- When applying a tag, ensure the male portion of the tag is on the back of the animal’s ear.

Use the right tag applicator

Each tag manufacturer may use slightly different technology for the fastening mechanism on their tags. In addition, tag applicators may differ from manufacturer to manufacturer in terms of pin configuration and insertion force. Even newer versions of tags offered by the same manufacturer may fit into the same tag applicator differently, resulting in an improper button seal.

To improve tag retention, use the appropriate tag applicator that corresponds with each specific brand of tags and follow the manufacturer’s instructions that accompany each package of RFID ear tags. This may include making minor adjustments to the tag applicator when using newer versions of a particular brand of tags.

Related best management practices

- Cut twines off bales when feeding cattle, as loose twines hanging out from bale feeders can literally cut tags off when animals pull their heads back from the feeder.
- Utilize appropriate parasite/lice herd health treatments to prevent cattle from excessively scratching against fence lines and feeders.
- Before you tag each animal, record its RFID tag number in your on-farm records, along with the animal’s management ear tag number. That way, if the animal loses its RFID tag and needs to be re-tagged, you can use its management tag to cross-reference its original RFID tag with its replacement. This ensures that the birth date linked to the animal’s original RFID tag is brought forward to its new tag.

PREMISE IDENTIFICATION (ID)

What is premises identification?

Premises identification is the assignment of a randomly generated, unique identification number to a physical land location referred to as a premises location allocator identification number or premises identification number (PLA ID or PID). The Canadian Cattle Identification Agency (CCIA) strongly encourages every producer to obtain a PLA ID or PID number by reporting the legal land description (LLD) of their primary premises (home quarter or operation) and record it in the Canadian Livestock Tracking System (CLTS).

How does premises identification fit with traceability?

A fully functional livestock traceability system is based upon three pillars:

- **Animal Identification** – To associate a unique animal identification number to a location and time.
- **Premises Identification** – To provide a unique identification of a physical location.
- **Movement** – To associate the identification number with a premises and time.

Premises identification is one of the three key pillars of a full traceability system. In order to track the third pillar, movement (move-in or move-out) or sighted events of animals to and from a premises, a PLA ID or PID is required.

Why do we need premises identification?

Registering and reporting your land location will provide CCIA and the Canadian Food Inspection Agency (CFIA) with specific location information for a faster response to assist producers if an animal health or food safety issue should ever arise.

Who should register their premises?

Premises identification affects a wide range of industry groups. Producers who have livestock residing on their land should register their land locations.

The land being identified can include:

- Home quarters
- Pastures
- Veterinary clinics
- Auction barns
- Livestock feedlots
- Abattoirs
- Fairgrounds

Benefits of premises identification:

- Assists in tracing animals to effectively manage an animal disease outbreak.
- Assists in responding to natural disaster emergencies (tornadoes, floods, fires, etc).
- Aids in disease control measures for animal health issues when more than one livestock species is affected.
- Aids to rapidly inform producers in affected areas of disease threats or control measures.
- Helps to rapidly coordinate sites for carcass disposal in the event of an animal disease outbreak.
- Assists with dispatching emergency resources to appropriate targeted locations to contain and assist with disease outbreaks.
- Helps to resume commerce and limit losses after animal disease outbreak.

Source: Canadian Cattle Identification Agency http://www.canadaid.com/Premise_ID/premise.html

Communicate It & Check It Out!

Does your farm have a Premise ID number? If not, work with your parents/farm owner to obtain a Premise ID. If you have a Premise ID number already, make sure you know where it is stored so it can be easily accessed.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

Research It!

Every fairgrounds in Ontario now has a Premise ID number. If your livestock Achievement Day is going to be held at a fair, find out what the Premise ID number is for the fairgrounds.

If your Achievement Day is being held at a farm or other location where you will be taking your project animal, you will still need to find out what the Premise ID is of the venue that you are going to.

AT HOME ACTIVITY #1

Take a look at how traceability affects your farm. Do you have a system for recording tag numbers when calves are born, or when they arrive on your farm? Be prepared to share your farm's system of recording at an upcoming meeting so that everyone can see that there are different ways of recording information.

AT HOME ACTIVITY #2

Find out what it costs to purchase one RFID tag and if there is a discount for purchasing larger quantities of tags. Additionally, find out what it costs to purchase the applicator needed for inserting the tags in the ears of cattle.

DIGGING DEEPER FOR SENIOR MEMBERS

In the case of a disease outbreak in Canada, what would be the course of action that would be taken? Which government agencies would be involved and what would the process be to track and try to contain the spread of the disease? Why is it important that this process happen quickly?

Are there any steps in this process that could be changed to make traceability more efficient and effective?

SECTION 1D: CODE OF PRACTICE FOR THE CARE AND HANDLING OF BEEF CATTLE

SETTING OBJECTIVES:

The Codes of Practice are nationally developed guidelines for the care and handling of farm animals. They serve as Canada's national understanding of animal care requirements and recommended practices. Codes promote sound management and welfare practices for housing, care, transportation and other animal husbandry practices. In this section, members will learn about the Code of Practice that is specific to the care and handling of beef cattle.

Suggested Lesson Outcomes

- To realize that there is a Canadian Code of Practice for the Care and Handling of Beef Cattle
- To know what information is contained in the Code of Practice
- To gain an appreciation that this document contains requirements and recommendations for the care and handling of beef cattle

ROLL CALLS

- When caring for beef cattle, what is one thing you need to make sure you do for them?
- Name one thing you can do to make sure the space where a beef animal lives is safe.
- Why do you think the National Farm Animal Care Council created the Codes of Practice for Livestock?

SAMPLE MEETING AGENDA

Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Code of Practice for the Care and Handling of Beef Cattle What's in the Code of Practice for Beef Cattle? <ul style="list-style-type: none">- Animal Environment- Feed and Water- Animal Health- Animal Husbandry- Transportation- On-Farm Euthanasia	40 min + Activities
At Home Activity	Reporting Animal Welfare Issues in Ontario	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

CODE OF PRACTICE FOR THE CARE AND HANDLING OF BEEF CATTLE

The Code of Practice for the Care and Handling of Beef Cattle was released in 2013. It can be found online at: <http://www.nfacc.ca/codes-of-practice> and then by choosing 'Beef Cattle.' To obtain a hard copy, contact the Canadian Cattlemen's Association at www.cattle.ca

The Code Development Committee and the Scientific Committee have worked together to develop a science- and consensus-based Code. The result is a Code that is scientifically informed, practical and reflects societal expectations for responsible farm animal care. The stakeholders that made up the Code Development Committee included farmers/producers, transporters, veterinarians, animal welfare and enforcement agencies, retail and food service organizations, processors, governments and researchers.

Codes of Practice are intended to promote sound management and welfare practices through recommendations and requirements for housing, care, transportation, processing and other animal husbandry practices. Codes serve as educational tools, reference materials for regulations, and the foundation for animal care assessment programs.

There are two aspects to the Code of Practice that have been created for many different types of livestock:

Requirements

- These refer to either a regulatory requirement, or an industry imposed expectation outlining acceptable and unacceptable practices and are fundamental obligations relating to the care of animals. Requirements represent a consensus position that these measures, at minimum, are to be implemented by all persons responsible for farm animal care. When included as part of an assessment program, those who fail to implement the requirements may be compelled by industry associations to undertake corrective measures, or risk a loss of market options. Requirements also may be enforceable under federal and provincial regulation.

Recommended Practices

- Code Recommended Practices may complement a Code's Requirements, promote producer education and can encourage adoption of practices for continuous improvement in animal welfare outcomes. Recommended Practices are those which are generally expected to enhance animal welfare outcomes, but failure to implement them does not imply that acceptable standards of animal care are not met.

The Code of Practice for the Care and Handling of Beef Cattle pertains to cattle of all ages in beef production. Where special provisions for cattle under six months apply, the word calf has been used. This Code applies to male and female cattle being raised for their meat. It does not apply to associated industries (e.g. veal, dairy). However, cattle from other sectors, when brought into a beef production operation, are subject to this Code.

WHAT'S IN THE CODE OF PRACTICE FOR BEEF CATTLE?

In addition to an introduction, the Code of Practice for Beef Cattle contains the following sections:

- Section 1 Animal Environment
- Section 2 Feed and Water
- Section 3 Animal Health
- Section 4 Animal Husbandry
- Section 5 Transportation
- Section 6 On-Farm Euthanasia

Section 1: Animal Environment

Desired Outcomes:

- All cattle are kept under conditions conducive to their safety, health, comfort, nourishment, and humane handling.
- Cattle can express natural behaviour.
- Cattle are not adversely affected by extremes in weather, such as cold, floods, freezing rain, storms, and heat waves.

This section contains information, requirements and recommended practices for:

- Protection from extreme weather
 - » High Temperature and Humidity
 - » Extreme Cold
- Facilities for cattle
- Additional facilities for calving cows

Section 2: Feed and Water

Desired Outcome: Cattle are in optimum health and body condition.

This section contains information, requirements and recommended practices for:

- Nutrition and Feed Management
- Water

Discuss It!

Do you think the Codes of Practice for livestock are necessary?

Reach Out!

Invite a guest from National Farm Animal Care Council, Canadian Centre for Food Integrity, Farm & Food Care Ontario or OMAFRA to speak about the Code of Practice for the Care and Handling of Beef Cattle.

Communicate It!

Living in Canada presents some unique housing and facility challenges for livestock compared to countries with warmer climates. What unique challenges do Canadian beef farmers face each winter?

Section 3: Animal Health

Desired Outcome: Optimum health and welfare are maintained through a combination of appropriate disease prevention and control measures and prompt treatment of illness, injury and disease.

This section contains information, requirements and recommended practices for:

- Herd Health Management
- Sick, Injured and Cull Cattle
- Health Conditions Related to Feedlot Cattle
 - » Managing Risk of Bovine Respiratory Disease
 - » Lameness
 - » Nutritional Disorders Associated with High Energy Feeding
 - » Buller-Steer Syndrome
 - » Managing Pregnant Heifers in the Feedlot
- Safety and Emergencies

Section 4: Animal Husbandry

Desired Outcome: Cattle experience minimal stress and discomfort, while necessary husbandry tasks are carried out properly, safely and in a timely fashion.

This section contains information, requirements and recommended practices for:

- Handling and Moving Cattle
- Reproduction and Calving Management
 - » Colostrum Management
- Identification
- Disbudding and Dehorning
- Castration
- Weaning
- Predator Control
- Tail Docking

Judge It!

Judge four different samples of feed for their quality and appropriateness for the pre-determined group of cattle that they might be fed to. Be prepared to give reasons for your choices.

Share it!

What emergencies and unsafe situations have members encountered when working with livestock and in particular, with beef cattle? What was done to stop/fix the situation?

Research It!

Look up in the Code of Practice for Beef Cattle to find out what the requirements and recommendations are for predator control for beef cattle. Be prepared to present your findings to the group.

Section 5: Transportation

Desired outcome: Cattle arrive at their destination in good condition.

Each person involved in various stages of cattle transportation in Canada has a role in ensuring that the transportation process (including loading, transport and unloading) does not cause injury, undue suffering, or death of the animals.

This section contains information, requirements and recommended practices for:

- Pre-Transport Decision Making and Preparation for Transport
- Arranging Transport
- Loading and Receiving

Section 6: On-Farm Euthanasia

Desired Outcome: Cattle are euthanized when necessary in a timely and effective manner.

Euthanasia is the humane termination of an animal's life. This may be necessary when a sick or injured animal is not responding favourably to treatment or has a poor prognosis. Euthanasia of an animal may also be necessary to ensure human safety, or for regulatory requirements associated with disease control. Be aware that cattle may hide signs of pain or suffering, and that this may affect your assessment of their condition in making a decision about euthanasia.

Having a euthanasia decision-making process and providing training in the techniques of euthanasia can help ensure that euthanasia is carried out in a timely manner. Cattle must be rendered unconscious with minimal pain or distress prior to the cessation of vital life functions. Depending on the method used, this may result from a single action (e.g. gunshot). In all cases, however, operators should be prepared to apply a second gunshot, or a secondary kill step (bleeding out or pithing) if the first application does not result in immediate unconsciousness and prompt death. This requires that all personnel involved in euthanasia be knowledgeable and competent in the techniques and equipment being used.

This section contains information, requirements and recommended practices for:

- Euthanasia and Culling Decisions
- Methods of On-Farm Euthanasia
- Confirmation of Insensibility and Death

Research It!

Look up in the Code of Practice for Beef Cattle to find out what the requirements and recommendations are for tail docking for beef cattle. Be prepared to present your findings to the group.

Discuss It!

Are there any sections that should be added to the Code of Practice for the Care and Handling of Beef Cattle that have been missed? Or, are there sections that you don't think should be there?

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

GLOSSARY OF TERMS USED IN THE CODE OF PRACTICE FOR THE CARE AND HANDLING OF BEEF CATTLE

The following definitions are used in the context of the Code of Practice for Beef Cattle:

Abomasum: the fourth stomach of cattle (and other ruminants). Corresponds to the true stomach of single-stomached animals.

Abortion: premature birth of a dead fetus.

Abscess: collection of pus in a cavity or capsule resulting from the disintegration of the infected tissue.

Acidosis: an abnormally acidic condition of the rumen (pH 5.3-5.7). Typically due to rapid or over-consumption of highly digestible feeds. It can cause digestive upset or even death.

Acute: short term or short duration.

Ad libitum: free choice; feed is freely available, allowing cattle to eat as much as they want, whenever they want.

Afterbirth: fetal membranes that are expelled after the birth of a calf.

Analgesic: a drug that relieves pain.

Anesthetic: a drug that causes a loss of feeling or sensation. There are two kinds of anesthetic: general and local.

- **Anesthetic – general:** a drug that causes a state of unconsciousness.
- **Anesthetic – local:** a drug that causes loss of feeling only in a limited area of the body.

Antibody: specific protein that is produced in response to the presence of a foreign protein (antigen) that has been introduced into the body.

Antigen: foreign substance (infectious agent) that, when introduced into the blood or tissue, triggers the formation of antibodies.

As fed: feeds that contain their normal amount of moisture

Average daily gain (ADG): amount of weight gained per day.

Back-fat: the amount of fat cover on an animal's back. It is usually measured at the twelfth to thirteenth rib.

Backgrounding: a growing program for feeder cattle from weaning until they are put on a finishing ration in a feedlot. Cattle may be grown on grass or fed harvested feed.

Barbiturate: a class of drugs that depress the central nervous system (brain and spinal cord).

Belly bulls: male cattle that have been improperly elastic or band castrated having one or both testicles trapped above the band/elastic against the belly. (See also: Belly nuts)

Belly nuts: testicles that are trapped against the animal's belly as a result of improper band or elastic castration. (See also: Belly bulls)

Biosecurity: measures taken to protect a population from potentially harmful illness or disease.

Bleeding out: a secondary kill step intended to ensure that an animal dies promptly following humane stunning. It allows the majority of an animal's blood to leave the body through a deliberate wound, usually the severing of the jugular vein in the neck.

Bloat: abnormal distension of the rumen as a result of accumulated gases that cannot escape.

Body condition score: A subjective score of the amount of fat an animal has. In Canada, a 5-point scale is commonly used (there is also a 9-point scale). It is an important tool for monitoring feeding program.

Bovine: refers to the general family of cattle species.

Bovine respiratory disease: disease complex of the respiratory tract of young cattle, often caused by a combination of viruses and bacteria. It is most often seen around weaning time and is sometimes referred to as shipping fever.

Branding: creating a permanent mark on the skin of an animal for the purposes of identification. (See also: Freeze branding, Hot iron branding)

- **Freeze branding:** the permanent identification of animals using super-cooled instruments to destroy the pigment-producing cells of the skin (melanocytes), resulting in white hair regrowth.
- **Hot iron branding:** the permanent identification of animals using super-heated instruments to create a specific mark indicating ownership.

Brisket: chest area of cattle.

Buller-steer syndrome: behavioural problem where a steer is repeatedly mounted by other steers in the group. Can result in poor performance or injury to the ridden (buller) steers.

Bunk: feed trough or container (also called feed bunk)

Caesarean section: delivery of a calf through an incision in the abdominal and uterine walls. It is usually a result of calving problems.

Calf: male or female bovine animal under six months of age.

Calving difficulty: abnormal or difficult labour, resulting in problems delivering a calf. (also called Dystocia)

Captive bolt: hand-held device used when euthanizing livestock. Captive bolt devices may stun or kill, depending on their design and power. Penetrating captive bolt devices pierce the animal's skull, whereas non-penetrating captive bolt devices deliver a powerful blow, rendering the animal unconscious without penetrating the skull.

Castrate: to remove the testicles from a male animal.

Chronic: long-term or long duration.

Colostrum: the first milk given by a cow after calving. It is high in antibodies that protect the calf from infection.

Compromised animal: an animal with reduced capacity to withstand transportation but where transportation with special provisions will not lead to undue suffering. Compromised animals may be locally transported with special provisions to receive care, be euthanized or slaughtered. (also see: Unfit for transport)

Corneal reflex: the reflex of blinking the eye when the surface of the eyeball (cornea) is touched.

Cow: sexually mature female bovine animal that has given birth to a calf.

Creep feeding: supplemental feeding of suckling calves in an enclosure (creep) that prevents larger cattle from entering.

Dam: female parent.

Dehorning: to remove the horns of an animal, after the horn buds have attached to the skull (at about 2-3 months of age). (also see: Disbudding)

Digestibility: the extent to which a feed is able to be digested.

Disbudding: to remove the horns of an animal before the horn buds have attached to the skull. (also see: Dehorning)

Dry matter: feed stuffs after the water (moisture) has been removed.

Dry matter intake: the amount of feed consumed on a dry matter basis (excluding moisture).

Dystocia: abnormal or difficult birth, resulting in problems delivering a calf.

Emaciation: being severely thin, as associated with starvation or illness.

Esophageal feeder: a device that allows the producer to safely deliver milk directly into a newborn animal's stomach (via the esophagus). Also called: stomach tube or tube feeder.

Euthanasia: the humane killing of an animal usually to prevent suffering or in the case of an untreatable illness or injury.

Feed bunk: trough or container used to feed cattle. (also called bunk)

Feed efficiency: ratio of feed required to produce a unit of weight gain.

Feedlot: cattle operation where cattle are typically housed in pens and fed stored feeds. Feedlots range in size from a few to thousands of cattle.

Feral: a domesticated animal that has become wild.

Finished cattle: cattle that are ready for slaughter.

Flight zone: the distance between an animal and a perceived threat (such as a human) at which the animal will move away.

Foot Rot: bacterial infection of interdigital skin of the foot, characterized by swelling of the foot.

Gestation: the period from conception to birth of a calf; typically 285 days in cattle.

Heifer: a young female bovine that has not yet given birth to a calf.

High energy feeding: a feeding regimen that relies on a nutritionally-balanced ration with a higher proportion of processed grains, premixes, and supplements and a lower proportion of forages such as hay or silage. Such diets are typically used to finish cattle prior to slaughter.

Homozygous polled genetics: cattle carrying uniform genetics for the absence of horns.

Humidex: a measure of effective environmental conditions that combines both temperature and relative humidity.

Hypothermia: low core body temperature.

Immunoglobulin: blood proteins produced by an animal's immune system in response to foreign proteins (antigens). Adult animals develop immunoglobulins normally as they are continually exposed to new antigens (active immunity). Calves are born without such immunoglobulins, which are too large to pass from the cow to the calf in utero. They must be passed to the calf through the cow's immunoglobulin-rich colostrum in the first 24 hours of life, after which time the calf's gastrointestinal tract is no longer able to absorb them.

In utero: in the uterus, i.e. during gestation.

Infectious arthritis: joint inflammation resulting from infection.

Insensible: unconscious and unable to perceive pain.

Laminitis: foot disease in which the sensitive tissues of the hoof or claw become inflamed and painful. It may be a result of ruminal acidosis.

Maternal antibodies: antibodies passed from the dam to her offspring, either during gestation or after birth via the colostrum.

Metaphylaxis: administration of antibiotics to a group of cattle in order to prevent or treat latent infections. Often used as a strategy to prevent morbidity of cattle newly-arrived at a feedlot.

Micronutrient: a component of the diet that is required only in a very small amount.

Mis-mothering: failure of a cow to bond with its newborn calf.

Morbidity rate: a measure of the level of illness, typically expressed as the percentage of animals that become sick in a given period of time.

Mortality rate: the percentage of animals that die within a period of time.

Non-ambulatory: Defined by the Canadian Food Inspection Agency (CFIA) as an animal that is unable to stand or walk without assistance.

Outcome-based measures of animal welfare: direct indicators of an animal's well-being, such as body condition score, morbidity and mortality rates, growth rate, reproductive performance.

Particle length: the length of forage particles in a feed ration.

Passive immunity: the acquisition of immunity from a donor animal; in this context, via the dam's colostrum.

Pithing: the destruction of the brain and brain stem by thrusting a blunt instrument into the skull. A secondary kill step in euthanasia.

Point of balance: a term used when handling cattle referring to a point on the animal's body (usually the shoulder) where the animal perceives a person to be standing in front of them (causing it to back up) or behind them (causing the animal to move forward).

Polled: naturally (genetically) hornless.

Post-partum: occurring after birth.

Pre-conditioning: steps taken by a cow-calf producer to prepare calves for marketing and shipping. It may include management procedures such as: starting calves on feed; vaccination; and weaning prior to shipping.

Rumen: the largest of the ruminant stomachs and the site of fermentation of fibrous feeds.

Ruminal epithelium: the lining of the rumen.

Scours: diarrhea.

Sire: male parent.

Spaying: to remove the ovaries to prevent pregnancy. It is occasionally performed in the beef industry to prevent pregnancy in heifers that must be housed with bulls.

Special provisions for transport: defined by the Canadian Food Inspection Agency (CFIA) as measures taken to ensure the safety and comfort of a compromised animal during transport to slaughter or for veterinary diagnosis or treatment. These may include: local and direct transport only; providing extra bedding; loading the animal last and unloading it first; separating it from other animals in the shipment; or transporting it with a familiar animal to help it remain calm.

Spinous vertebral processes: projections of bone that emerge from the vertebral column (backbone). Used as landmarks when body condition scoring.

Steer: a castrated male bovine.

Stray voltage: the accumulation of low levels of electricity in the metalwork of a barn or other farm infrastructure, such as watering devices. It is usually a result of poor wiring or improper grounding of the electrical system. It can result in cattle receiving shocks when they drink or

enter handling equipment. (also called tingle voltage)

Stunning: rendering an animal unconscious prior to euthanasia or slaughter, usually with a captive bolt device.

Supplement: an addition to a livestock ration intended to make up for any nutritional deficiencies in the base ingredients.

Tail docking: the removal of part or all of an animal's tail.

Tethered: confining an animal by the neck, using a halter, collar, or stanchion.

Tingle voltage: the accumulation of low levels of electricity in the metalwork of a barn or other farm infrastructure, such as watering devices. It is usually a result of poor wiring or improper grounding of the electrical system. It can result in cattle receiving shocks when they drink or enter handling equipment. (also called stray voltage)

Toe-tip necrosis: damage to and infection of the smallest toe bones in the foot, typically of the hind limb.

Transverse vertebral processes: projections of bone that emerge from the side of the vertebral column. Used as a landmark when body condition scoring.

Tube feeder: a device that allows the delivery of colostrum or milk directly into the stomach of a calf. (also called esophageal feeder)

Unfit for transport: an animal with reduced capacity to withstand transportation and where there is a high risk that transportation will lead to undue suffering. Unfit animals may only be transported for veterinary treatment or diagnosis.

Weaning: the separation of calves from their dams and the removal of milk as a food source.

- **Weaning abrupt:** complete and sudden separation of the cow and calf with no tactile, visual, or auditory contact.
- **Weaning – fence line:** separation of the cow and calf to opposite sides of a fence, thereby having visual and auditory contact.
- **Weaning – two stage:** Calves initially remain with their dams, but wear a nose-flap to prevent nursing for 5-7 days. Then the nose flaps are removed and the cow-calf pairs are separated.

AT HOME ACTIVITY

The Code of Practice is a guideline for the care and handling of beef cattle. All provincial and federal acts and regulations must always take precedence. Causing unnecessary pain or suffering or willful neglect is illegal under the Criminal Code of Canada and under most provincial statutes. It is of benefit to the whole Canadian cattle industry that anyone witnessing animal neglect or cruelty takes some action to remedy the situation by helping to educate the producer, or by contacting the appropriate cattle producers' organization or animal welfare authorities.

In Ontario, find out what the appropriate cattle producers' organization is that you should contact if you ever saw a cattle welfare situation and be ready to tell the group at the next meeting which organization this is.

Hint: This organization has Animal Care Advisors that work alongside animal welfare authorities when someone has reported a possible animal welfare situation for beef cattle.

DIGGING DEEPER FOR SENIOR MEMBERS

Euthanasia

Euthanasia is almost always a difficult subject but it is also, from time to time, a part of animal husbandry. As a senior 4-H member, it is important to familiarize yourself with the requirements and recommendations for euthanasia should such an occasion ever occur. Because of the sensitive nature of this topic, there is no accompanying activity. It is advised that after reading the following information, if you have any questions be sure to ask your 4-H club leaders, a veterinarian or a beef producer that is comfortable talking about this subject.

As outlined in the Code of Practice for the Care and Handling of Beef Cattle, being prepared for on-farm euthanasia includes:

- competent personnel (through training, experience, or mentorship)
- access to proper equipment
- clear decision points for euthanasia

The requirements for this are to euthanize without delay cattle that:

- are unlikely to recover, or
- fail to respond to treatment and convalescent protocols, or
- have chronic, severe, or debilitating pain and distress, or
- are unable to get to or consume feed and water, or
- show continuous weight loss or emaciation.

When choosing a method of euthanasia, consider the following:

- animal welfare
- skill level of the person performing euthanasia

- human safety
- carcass disposal
- potential need for brain tissue for diagnostic purposes

The requirements for choosing an acceptable method for euthanizing cattle must be used:

- Euthanasia must be performed by competent personnel (through training, experience, or mentorship).
- Equipment used for euthanasia, such as guns or captive bolt devices, must be maintained according to manufacturers' instructions to ensure proper function.
- Non-ambulatory cattle may not be dragged or forced to move prior to euthanasia.

Important - The following are some examples of methods that are unacceptable because they cause suffering:

- manually-applied blunt trauma to the head – does not consistently cause immediate loss of consciousness
- injection of chemical agents not approved for euthanasia into conscious cattle – does not cause immediate loss of consciousness
- air embolism – causes pain associated with cardiac arrest
- electrocution – causes pain associated with cardiac arrest after ineffective stunning
- exsanguination (bleeding out) without proper stunning first – causes pain and distress prior to loss of consciousness.

Recommended practices for euthanasia include:

- avoid moving or handling cattle more than necessary prior to euthanasia
- restrain cattle as necessary for euthanasia, choosing the safest and least stressful method of restraint possible
- consider, in consultation with your veterinarian, using sedation to facilitate the euthanasia of unmanageable or aggressive cattle
- consider pithing as an alternative secondary kill step where aesthetic or sanitary concerns make bleeding out unfeasible

Death does not occur immediately but is the result of respiratory and cardiac failure, which can take several minutes. It is therefore essential that animals be swiftly rendered insensible, and remain insensible until death has occurred. For this reason, euthanasia methods that affect the brain first (shooting or captive bolt) are usually preferred.

An animal has not been successfully rendered insensible if it shows any of the following signs:

- vocalizes
- attempts to rise or right itself
- lifts its head
- shows eye movements or blinks

Requirements for ensuring an animal has been rendered insensible

Evaluate the animal's consciousness immediately after the application of the appropriate euthanasia method by checking for a corneal reflex. Be prepared to immediately deliver a second application should the first attempt not render the animal immediately insensible. Confirm death before moving or leaving the animal.

Confirm insensibility:

- Touch the eyeball and note if the animal blinks (corneal reflex). An insensible animal will not blink.

Confirm death: A lack of heartbeat and respiration should be used to confirm death:

- Evaluate heartbeat by physical palpation or by placing a stethoscope over the left lower chest area of the animal, just behind the elbow.
- Evaluate respiration by observing the chest for any breathing movement. Note that breathing may be slow and erratic in an unconscious animal.

SECTION 1E: TRANSPORTATION OF CATTLE

SETTING OBJECTIVES:

The humane treatment of animals during transport is a shared responsibility between individuals who may be involved at any stage of the process.

Suggested Lesson Outcomes

- To understand the federal requirements for transporting cattle
- To be able to identify what a compromised animal is
- To understand what can and cannot be done in regards to transportation of compromised cattle
- To understand what practices are acceptable for transporting cattle

ROLL CALLS

- Name one reason you cannot transport an animal.
- Name one practice that helps to minimize stress when loading, unloading and/or transporting cattle?
- If transporting a compromised animal that is deemed okay for transport for a short distance, what can be done to help make the animal more comfortable?

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Transportation of Cattle Compromised Animals Transportation Practices	30 min + Activities
At Home Activity	Driver Licence Requirements for Cattle Truckers in Ontario	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

TRANSPORTATION OF CATTLE

Transportation is one of the most stressful events that an animal will experience during its life due to the unfamiliar surroundings, noises, vibrations and movements, the proximity to humans, handling and unfamiliar animals, exposure to adverse conditions, and the lack of access to feed and water. An animal's condition can deteriorate quickly in these circumstances.



Source: <http://www.beefmagazine.com>

Every person responsible for transporting animals in Canada must ensure that the entire transportation process including loading, transit and unloading - does not cause injury or undue suffering to the animals.

The federal requirements for animal transport are covered under the *Health of Animals Regulations, Part XII* (<http://www.inspection.gc.ca/about-the-cfia/accountability/consultations-and-engagement/har/interpretive-guidance/eng/1480700699158/1480700769747>). These requirements are enforced by the Canadian Food Inspection Agency (CFIA) with the assistance of other federal, provincial and territorial authorities.

These federal requirements regulate the transport of pets, livestock, and exotic animals by all modes of transport - land, air and sea. Some provinces also have additional regulations related to animal transport.

Federal requirements for transporting livestock define:

- the conditions under which an animal is considered unfit for travel
- the transportation practices to be used during loading, transit and unloading

It is the responsibility of both the transporter and any person having livestock transported to ensure all animals being shipped are fit for the trip. This should be done by someone familiar with the animals or a veterinarian.

COMPROMISED ANIMALS

Compromised animals are fragile. They cannot handle the stress of transportation very well, due to such causes as injury, fatigue, poor health, distress, or very young or old age. Depending on their condition, compromised animals fall into two categories - those that can't be transported and those that can only be transported with special provisions.

The transporter and/or the person having livestock transported must determine which category a compromised animal falls into.

Never transport an animal unless you are sure it is healthy enough to handle the stress of transportation. If you are not sure, seek the advice of a veterinarian or contact the CFIA before preparing the animal for loading.

Compromised Animals: Do Not Transport

Some animals are completely unfit for transport. In this case, you must delay transport until the animal is fit for the trip if it is humane to do so (for example, when an animal has recently given birth). If delaying transport could result in undue suffering and if the animal is unlikely to get better on its own, the animal must either be treated or euthanized on site.

Some examples of conditions where animals must not be transported include (but are not limited to):

- an inability to stand without assistance or to move without being dragged or carried
- a fracture that considerably hampers mobility or is likely to cause severe pain when the animal is being loaded or transported
- dehydration
- exhaustion
- shock or impending death
- a suspected or confirmed nervous system disorder
- fever
- uterine prolapse
- a hernia that impedes movement, is painful on palpation, touches the ground when the animal is standing in its natural position, or has an open skin wound, ulceration, or obvious infection

Compromised Animals: Transport Only with Special Provisions

If you can take steps to prevent additional injury or undue suffering, you can move some compromised animals. Transport these animals for immediate slaughter directly to the nearest appropriate slaughter establishment, keeping transport time to a minimum. **On the advice of a veterinarian**, you can transport a compromised animal to a veterinary clinic for treatment or diagnosis.

Check It Out!

Visit the CFIA website to make sure you have the most up-to-date information about transporting cattle.

Some examples of conditions where animals may only be transported with special provisions include (but are not limited to):

- frostbite
- bloat (if not weak or already down)
- laboured breathing
- penis injury
- blindness in both eyes
- an amputated or missing limb
- rectal or vaginal prolapse
- a recent operation such as dehorning or castration that has not fully healed
- a recent birth (the animal has delivered in the past 48 hours)
- an open wound with bleeding and/or exposed bone

If you are not sure what special provisions to take when moving a compromised animal, **always ask a veterinarian**. He or she may suggest, for example:

- emergency veterinary care prior to transport
- providing extra bedding
- loading the animal last and unloading it first
- separating it from other animals in the shipment
- transporting it with a familiar animal to help it remain calm

TRANSPORTATION PRACTICES

It is illegal to cause undue suffering to an animal at any point in the transportation process. Practices that can help protect animals during transportation include:

- using loading and unloading facilities as well as containers and transport vehicles suitable to the animals being loaded
- using movement devices (e.g. pig boards) that do not frighten the animals or cause injury or undue suffering
- providing adequate space and headroom for animals to stand in a natural position
- providing feed, water and rest at required intervals
- providing adequate ventilation for all animals

Judge It!

Have four livestock trailers placed in close proximity to each other. Discuss what members should look for in a livestock trailer such as cleanliness, doors that latch, bedding, items that might injure livestock (such as sharp edges, wires) among other things. Once this criteria has been discussed, have members judge the trailers and give reasons for their placings.

- providing non-slip, textured footing surfaces suitable to the animals being transported
- providing protection from the weather
- providing immediate attention, including veterinary treatment at the scene if necessary. If an animal becomes unfit for transport during the trip, it must be cared for, treated or euthanized.

Is That Animal Fit for the Trip?

If you are responsible for transporting animals, you **must** be familiar with and follow Canada's animal transport requirements. If you do not comply with the regulations, you could be fined or prosecuted. If your actions or neglect are considered animal abuse, you could also be charged and convicted under the *Criminal Code of Canada* and/or provincial regulations.

If you are not sure an animal is fit for the trip, contact a veterinarian or the CFIA

Source: Canadian Food Inspection Agency <http://www.inspection.gc.ca/animals/terrestrial-animals/humane-transport/transport-requirements/eng/1363748532198/1363748620219>

Reach Out!

Invite a guest speaker from the OPP to discuss what happens when there is an emergency involving cattle while being transported.

Reach Out!

Invite the owner of a livestock transportation company or a cattle trucker to a meeting to discuss their experiences and how regulations have changed and are continuing to change in regards to livestock transportation in Ontario.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

In order to drive a cattle truck or tractor trailer, the driver must have a special licence. Research and find out what kind of licencing the driver needs to be able to operate in Ontario and be prepared to share your findings at the next meeting.

DIGGING DEEPER FOR SENIOR MEMBERS

What happens when an accident occurs involving a truck/trailer/tractor trailer containing cattle? First responders won't necessarily have a livestock background to understand how animals will react in a stressful and possibly painful situation.

Find out what training is offered in Ontario for first responders as well as those working in the trucking industry so that everyone is prepared should an accident happen and livestock are in peril.

DIGGER DEEPER II FOR SENIOR MEMBERS

There are laws for the number of consecutive hours that a truck driver can be on the road before taking a break. There are also laws for consecutive hours of travel for cattle as well. Research and find out what the rules are for consecutive hours and how the industry works to conform to these rules.

THE BEEF FARM



SECTION 2A: CATTLE FACILITIES

SETTING OBJECTIVES:

Although not much has changed over the years with the types and design of facilities used for beef cattle - there are new fabric barns and new types of flooring - the basic principles remain the same. Sorting out the type of farm you want, and the production system you will use, will determine what you need for facilities.

Suggested Lesson Outcomes

- To learn what are essential parts of a beef facility in order to ensure both animal and handler safety
- To understand the different types of housing that can be used for beef cattle
- To be able to identify various considerations when designing a beef cattle facility

ROLL CALLS

- Name one consideration a beef producer must think of when choosing what type of housing they are going to have for their beef cattle.
- Why would a beef producer choose to house animals outside?
- Name one thing to consider when designing an outdoor confinement area for cattle.

SAMPLE MEETING AGENDA Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Cattle Facilities <ul style="list-style-type: none"> - Cow/Calf - Backgrounding - Feedlot Cattle Facility Considerations Cattle Facility Components	40 min + Activities
At Home Activity	Beef Facilities Picture Collage	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

CATTLE FACILITIES

A MUST FOR ALL BEEF CATTLE FACILITIES

1. **Strong Fences and Gates** are necessary on all beef farms. Posts should be treated so they remain strong and do not decay. They should be no more than 2.5 metres apart.
2. **Non-Slip Concrete Floors** help to reduce animal injury and increase traction. They are most important around waterers, feeders and other areas which often become wet. Concrete floors can be grooved to give animals traction. Grooves are most effective when they are diagonal to the direction of animal traffic. If the grooves are perpendicular, the floor will be harder to scrape. Diamond shaped grooves work well in wet areas.

Beef cattle handling facilities should be located:

- In a well-drained area
- Close to the feedlot, pasture or barnyard containing the cattle
- Close to good roads with turning room for vehicles
- In keeping with plans for future expansion

Handling facilities will be covered more in-depth in Section 3b.

The facilities you need depend on:

- Design of current and future facilities
- Size, weight and number of cattle
- The type of work
- The labour you have available

CATTLE FACILITY – COW/CALF

In Ontario, our weather determines how elaborate the calving facility needs to look like. Traditional calving during the winter months requires some type of barn to protect the newborn calves from the elements and typically include a heat source of some kind. During the summer months cows can calve out on grass. This eliminates the need for a heat source and a specific calving barn.

Where do the cows spend the winter if there is no barn for them? Windbreaks and bedded pack dry lots will work for housing the cows. Cows need shelter from wind, more than from rain or snow. By using tree lines and groves for cover, cows can get out of the wind. If they are out of the wind, cold can be managed by the animal's internal metabolism.

Experience It!

Tour various beef facilities in the area to see the differences in design.

Find out how old the building is, how cattle are fed in the facility, where the cattle have access to water and how cattle are moved around in the facility.

Ask the beef producer/owner of the facility 'If they were to re-build, is there anything that they would do differently?'

Using existing trees or planting trees for windbreaks is the cheapest option for keeping cows sheltered from the elements. By bale grazing and feeding out on pasture, manure can be spread as the cows eat, supplying soil with nutrients and organic matter. In the absence of trees, portable wind breaks could be used.

Things to consider in locating a dry lot include:

- raised area for bedded pack
- sufficient slope to direct runoff to proper location
- windbreak for shelter
- feeding area (preferably with paved surface)
- adjacent alley ways (for sorting livestock into different areas, feed and manure handling equipment, etc.)
- sufficient distance from surface water, wells, neighbours, etc.
- proper site preparation so water from the roofs of adjacent buildings and overland flow of field runoff does not enter livestock yard area.

Beef Animal Space Requirements for Dry Lots

Type of housing	Area per animal (square ft/hd)		
	Cows and Bred Heifers	Feeders (750 lbs)	Calves (500 lbs)
Earth lot without mound	600	500	400
Earth lot with bedded mound (bedded mound area)	300 (35)	250 (30)	150 (25)
Paved lot	80	50	40

Source: OMAFRA <http://www.omafra.gov.on.ca/english/livestock/beef/news/vbn0515a3.htm>

Dry bedded mounds inside the windbreaks allow the cows a place to stay dry as well as out of the wind. Keep the bedded mounds away from feeding and watering areas. Rectangular shaped mounds are easier to manage. Have good drainage around the mounds. A well-compacted soil base material is essential. The top should be rounded with a minimum height of 5 ft. (1.5 m) at the centre. Side slopes must be flat enough that cattle can easily walk to the top of the mound. Maximum side slopes of 1:4 are recommended.

Wood chips and straw can be used for bedding

- Wood chips or shavings: 12.5 lb. /1000 lb. animal weight (1.25 kg/100 kg), applied once a week. Do not use wood products for bedding if the wood has been treated with preservatives.
- Straw: 25 lb. /1000 lb. of animal weight (2.5 kg/100 kg), applied at least three times a week (preferably daily)

Cattle Facility – Backgrounding

Most cattle are backgrounded on pasture. See Section 3c for more information on pasture management.

Cattle Facility – Feedlot

There are two main types of housing methods for feedlot cattle in Ontario – conventional barns and outdoor confinement areas. Some feedlots use a combination of the two.

Conventional barns for feedlot cattle include a roofed facility with concrete or stone walls and some type of ventilation system which could be windows, chimneys, doors, ridge vents, fans and/or curtains amongst many choices.

Livestock yards that include permanent outdoor confinement areas provide a low cost alternative compared to conventional barn facilities for raising animals. Both earthen and paved permanent outdoor confinement areas reduce the need for expensive housing, feeding, ventilation and manure storage systems, while retaining the ability to land apply the captured manure nutrients effectively. By creating a solid base for the pen floor (i.e. paved or concrete) and managing runoff leaving the confinement area or livestock yard, one can significantly reduce the risk to ground and surface water and still realize the economic and production advantages of open air production systems.

Recommendations for Design of Outdoor Confinement Areas and Livestock Yards

A properly designed, sited and constructed livestock yard can be a positive addition to the farm. Benefits of a well-designed permanent outdoor confinement area and livestock yard include animal health, environmental protection and labour efficiency.

Elements to consider in designing a livestock yard and outdoor confinement area include:

- raised area for bedded pack (if bedded pack is not provided in a barn)
- sufficient slope to direct runoff to proper location
- windbreak for shelter
- feeding area (preferably with paved surface)
- adjacent alley ways (for sorting livestock into different areas, feed and manure handling equipment, etc)
- sufficient distance from surface water, wells, neighbours, etc
- proper site preparation so water from the roofs of adjacent buildings and overland flow of field runoff does not enter livestock yard area.

Judge It!

Have four different samples of bedding for beef cattle (choices could include straw, old hay, wood chips, shavings, corn stalks or bean straw). Discuss what is needed for good, effective bedding material (low dust, absorbent, cost of bedding) for a beef farm. Judge the four samples and give reasons for the placings.

Minimum space requirements per animal for livestock in a livestock yard (paved or concrete surface)

Type of Livestock	Area (m ²) per animal*	Area (ft ²) per animal*
Beef cows	7	80
Beef backgrounders	4	45
Beef shortkeeps	7	80
Ewes and rams	1.4	15
Feeder lambs	0.6	6

Source: OMAFRA <http://www.omafra.gov.on.ca/english/engineer/facts/11-007.htm#2>

Note: Space allocation assumes a fence-line feeder is being used. If feeders are placed inside livestock yard, add 40%–50% of additional space per animal.

Pastures are Not Permanent Outdoor Confinement Areas

Pastures are areas where animals directly graze or forage from available vegetation for most of their nutritional requirements. These are not outdoor confinement areas while being grazed. With pastures, nutrients tend to be recycled back onto the land so the nutrient management system does not have to fully account for the manure and runoff generated. Good management will prevent grazing animals from having adverse effects on nearby water resources (i.e. wells located in the pasture area or from livestock accessing water courses).

CATTLE FACILITY CONSIDERATIONS

Each producer needs cattle facilities that work for their cattle as well as their own unique situation. In addition to animal welfare and behaviour, producers consider a number of different things when creating their facility plans:

- The purpose of the facility
- Current facility components
- Cost
- Local weather
- Land topography and environmental stewardship
- The type, size, weight and number of cattle
- How temporary or permanent they may want their components to be
- Applicable regulations and guidelines for their selected location
- Labour available
- Time available for management and upkeep
- Possible future additions they may be considering.

A well thought out facility will promote the well-being of cattle, which in turn benefits producers.

CATTLE FACILITY COMPONENTS

There are a lot of different facility components and layout options, so it's important that farmers choose what works the best for their operation's needs.

Watering System

Watering systems allow for an animal's basic water requirements to be met. Before choosing which watering system components you'll use as part of your facility, you need to consider the available water sources and the amount of water needed. Animals with easy access to enough good quality water are healthier and more productive.



Cattle drinking from a frost-free nose pump.
Credit: Canadian Cattlemen <https://www.canadiancattlemen.ca>



Credit: Elizabeth Johnston

Reach Out!

Invite a Building Engineer or the owner or someone who works at a construction company that specializes in building agricultural facilities for cattle as a guest speaker at your meeting.

Feeding System

Feedings systems allow for the basic feed requirements of animals to be met. It allows feed to be distributed appropriately to specific animals. Before choosing which feeding system components you'll use as part of your facility, you need to consider the type and amount of feed being fed, feeding frequency and whether you're feeding an individual or a group of animals. Animals that are fed properly have the greatest chance to be efficient and productive. The right feeding system will also reduce the amount of feed that goes to waste.

Discuss It!

There are different types of feeding systems that can be used for beef cattle. In addition to the fence-line-type feeder pictured here, name other types that are used on Ontario beef farms.

Fencing

Whether temporary or permanent, fencing is used for containment and to keep groups of animals separate. Fences can also help guide animals that are being moved.

Shelter

Shelter allows animals to better cope with the extreme weather conditions that can occur throughout the year - which in Canada is pretty much a guarantee! Access should be given to areas, either natural or man-made,

that provide relief from weather that is a serious risk to an animal's welfare. Animals with appropriate shelter have more energy to put into production.



Credit: <http://lfpres.com/>



Credit: <https://integritypoststructures.com/post-frame-livestock-shelter/>

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about beef cattle facilities through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

Gather pictures of various beef facilities from farm publications and from online. Create a poster with these facilities and label the pictures as to whether the facilities are for cow-calf, backgrounders or feedlot cattle, or a combination of different types of cattle. Be prepared to show your poster at a club meeting and possibly put your poster on display at your Achievement Day, Awards Night, at a local agricultural fair or community event.

DIGGING DEEPER FOR SENIOR MEMBERS

Design a new facility for feedlot cattle that will house up to 500 head of finished cattle. Keeping cost in mind, design the facility with a handling system, feeding system, watering system and a way to load and unload cattle.

When designing the new feedlot, remember how cattle behave. Design the facility to accommodate this behaviour to make the environment as low-stress as possible for both the cattle and those working in the feedlot.

SECTION 2B: HANDLING FACILITIES – SAFE & EFFECTIVE HANDLING

SETTING OBJECTIVES:

Excessive stress in cattle leads to reduced productivity, such as low weight gains, low conception rates, low milk yields, high pre-weaning mortalities, high susceptibility to disease and potential injury. All beef farms need to have proper handling equipment for handling and processing cattle both for the sake of the animals and the handlers.

Suggested Lesson Outcomes

- To realize why a proper cattle handling system is essential for a beef farm
- To learn what equipment is needed for a proper cattle handling system
- To understand why low stress cattle handling is ideal for every beef farm

ROLL CALLS

- Name one piece of equipment used for handling beef cattle.
- Name something you can do when handling cattle to make it less stressful for the cattle.
- Why is it important to have as little stress as possible on cattle when handling them?

SAMPLE MEETING AGENDA Time: 1 hour 40 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Facilities for Handling Beef Cattle Size of Facilities Low Stress Cattle Handling Pain Mitigation Activity #1 Handling System Design	60 min + Activities
At Home Activity	Cattle Handling Systems Pictures	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

FACILITIES FOR HANDLING BEEF CATTLE

Any farmer who is dealing with cattle needs some type of handling facilities whether he or she has ten steers or a thousand steers. Handling facilities are, and will continue to be an important part of a successful cattle operation, allowing the farmer many advantages and options.

Handling facilities allow producers to make use of current and future technology available in the industry. From simple tagging to more complex health management practices a good handling facility gives the farmer the choice of what to use and what not to.

With many beef operations being a part time enterprise, time and labour are often at a premium. Good facilities reduce the time and labour needed, and therefore reduce the costs. The labour force may also be happier and more willing to work in an efficient facility.

The safety and health of both the animals and the people working them need to be considered any time cattle are handled. Cattle often outweigh the operator by a considerable amount, and with four legs are much more stable and better balanced. Good facilities, with slip resistant flooring, will reduce stress levels, and help to prevent expensive bruising.

Many management procedures give better results if applied with a certain level of skill. This is much more likely to happen if the animal can be properly restrained. Farmer satisfaction with a job done right is also a side benefit of a good handling facility.

Good facilities for handling and housing beef cattle are simple, strong and durable.

Experience It!

Visit a farm supply store or a farm show (such as Canada's Outdoor Farm Show or the International Plowing Match and Rural Expo) that has cattle handling equipment on display to see the various types that are on the market. Take note as to how safe the systems are for both the cattle and the handlers.

There are three main parts of beef cattle handling facilities:



1. Crowding Pen

The circular or angular crowding pen funnels cattle in single file into the working chute. The crowd gate is used to force the animals toward the chute. Cattle will be less distracted with solid sides and crowd gates.

Credit: <https://www.hi-hog.com/products/cattle-handling-equipment/crowding-tubs-sweeps/>

2. Working Chute

The working chute lines up and hold the cattle in single file ready to enter the headgate or squeeze. It should be long enough to line up and hold at least three animals, but narrow enough so they cannot turn around. Animals will move most easily through a curved chute.

Credit: <https://www.hi-hog.com/products/cattle-handling-equipment/working-alleys/>



3. Headgate

The headgate is used to safely and securely restrain animals during treatment. It must be quick and easy to operate and adjustable for different sizes of cattle. There are four types of headgates: self-catcher, scissor stanchion, positive and full-opening stanchion.



Headgate with Neck Extender

Credit: <https://www.hi-hog.com/products/cattle-handling-equipment/squeeze-chute-options/neck-extende/>

Judge It!

Visit a farm supply store that sells cattle handling equipment or gather four pictures of different styles of handling equipment. Look at the equipment and discuss what the best features (criteria) are in a handling system. Rank the handling systems and give reasons for the placings.

There many optional parts of beef cattle handling facilities.

Holding Pens are used to hold cattle before they enter the working area. They allow for faster sorting of cattle and prevent mixing of worked groups with non-worked groups.

The **Squeeze** holds the animal by its sides, giving you greater control. The animal struggles less and is under less stress. The squeeze is often fastened to the end of the chute and followed by the headgate.

Cutting Gates are useful to take an animal out of the group or to work with a downed animal.

Blocking Gates can be used along with the working chute to

prevent an animal from moving forward or back. They can slide across the chute on a track or drop down with a rope and pulley similar to a guillotine.

Back Stops work similarly to blocking gates except they only prevent animals from backing up.

Kick Bars prevent the animal from kicking the worker. The kick bar holds should be 30 to 40 cm above the floor of the squeeze and spaced 1.4, 1.5 and 1.7 metres back from the headgate.

Scales, for weighing your animals, can be located in the main chute or close by where cattle can be easily diverted into them.

Man Gates and Passes are safety and convenience features. A man gate behind the squeeze allows you to block off upcoming cattle, giving you room to work and allows you in behind the animal without having to crawl over the chute every time. Man passes should be 28 to 35 cm wide and placed in the crowd pen, along the chute or any place you could become trapped and need an escape route.

Loading Chutes and Ramps can be located coming off the working chute or out of the crowding or holding pens. Cattle don't like climbing, so a ramp should not be steeper than 30 degrees (20 degrees is ideal). It should have 5 cm cleats spaced 20 cm apart. Cattle move much more easily up a stair step ramp with a 30 cm run and 10 cm rise for the steps. Loading is also much easier if the cattle are in single file and there is a flat platform at the top of the ramp for them to step on or off the truck from. The chute should have solid sides, be wide enough to accommodate the largest animals in your herd and should not face the sun.

Cattle Guards or Texas Gates are useful in cattle yards into which you must drive. These gates have pipes or bars laid horizontally over a shallow pit. Vehicles and people can pass over them but the cattle cannot because their feet will slip between the bars.

SIZE OF FACILITIES

The chart below gives you some guidelines to use when designing your own cattle handling facilities.

<u>Animal Weight</u>	Under 270kg	270-540kg	Over 540kg
	<u>(Under 600 lbs)</u>	<u>(600-1200 lbs)</u>	<u>(Over 1200 lbs)</u>
Holding area (sq m/head)			
• worked immediately	1.3	1.6	1.9
• held overnight	4.2	4.6	5.6
Working Chute - Vertical Sides(m)			
• width	0.45	0.55	0.70
• length	7.2	7.2	7.2

Working Chute - Sloping Sides(m)

- width at bottom 0.55
- width at 1.5 m height 0.80
- length 7.2

Loading Chute(m)

- width 0.65 0.80 0.80
- length 3.6

Ramp Height (m)

- Gooseneck trailer 0.38
- Pickup truck 0.70
- Van type truck 1.00
- Tractor trailer 1.20
- Double deck 2.50

Chart Credit: B.C. 4-H Beef Member Manual

LOW STRESS CATTLE HANDLING

Using a low stress approach to handling cattle will be easier on them and on you. The benefits of this method include a reduced chance of injury to the animals as well as their handler, calmer animals that are easier to manage, and a more productive herd. An animal handled gently is more content and will feed better, resulting in increased performance. But, low stress handling can only be achieved by understanding the animals and training them to do what you want them to do – rather than you reacting to them.

Cattle can become excited in a few seconds, but require 20 to 30 minutes for their heart rate to return to normal. The degree of stress an animal experiences is related to its familiarity and comfort with people and the quality of handling – easy and quiet as opposed to forceful and loud, for example. In addition, each animal has its own personality resulting from genetics and previous life experiences.

Push, release and reward and a refined sense of timing are the tools a respectable livestock handler employs.

Experience It!

Visit a cattle processing facility to have a look at their cattle handling equipment. If possible, visit while cattle are being processed to see the equipment in action. Take note of how the handlers work with the cattle.

Research It!

Dr. Temple Grandin is world-renowned for her work with cattle behaviour and has many videos and publications about low stress cattle handling. Do a search to find these resources to learn about her techniques and suggestions for working with cattle.

Instinct	Situation that Challenges Instinct	Cattle Reaction	Safe Handling Technique
Herding: Herding offers shelter and safety from predators.	Singling out the animal	Can make the animal anxious, lonely or depressed	Limit the time that an animal is alone. If an animal must be separated, keep the herd nearby. Move the animal slowly with minimal noise.
Habitual: Comfort is derived from routine.	Dairy cows are not allowed to enter the barn for milking	Cattle may become frightened or agitated.	Maintain a routine for the animals.
Flight: The flight zone is considered a safe, personal space.	Movement towards an animal in a corral	Cattle move away to keep you out of their flight zone.	To prevent the animals from bolting, don't penetrate too deeply into the flight zone. Proper, patient use of this zone will help you move the cattle where you want them.
Territorial: Animals are attached to their own territory and derive comfort from this area. Male animals dominate an area.	Moving animals off of a well-worn path or removing a bull from its pen.	An animal may protect its territory. This is compounded by the insecurity of being removed from the herd.	Try not to separate or move animals at feeding time. Never turn your back on bulls or on anxious animals.
Maternal: Cows normally protect their young from danger. They sometimes do this prior to calving, too.	Removing a calf from a cow.	A normally docile animal may become aggressive and could kick or charge.	Do not go between a mother and its young. When entering a pen, if possible, separate the mother in a nearby holding area. Anticipate aggression.
Note: This table is based on a chart developed by the Institute of Agricultural Rural and Environmental Health in Saskatchewan.			

Five Natural Instincts

Cattle react based on five natural instincts as described in the table below. A handler must be aware of what actions trigger an instinctive response, and how to deal with each.

All animals are unpredictable and each reacts differently. Aggression in cattle can be triggered by yelling, whistling, erratic movements and waving arms. Moving cattle into an area unfamiliar to them will also trigger this response. Shades of light, shadows, new and unfamiliar objects, enclosed spaces, and restraint and ground conditions are critical factors in triggering natural fear and flight responses. Never turn your back on an aggressive or anxious animal! Signs of aggression are characterized by dropping the head, turning to the side, pawing, raised ears, snorting, quick and erratic movement and a raised tail.

Behavior Principles for Handling

The low stress approach to handling cattle is based on a knowledge of their natural instincts, and on an awareness of an animal's point of balance, its field of vision and its flight zone. Understanding these is crucial to creating, stopping and directing movement.

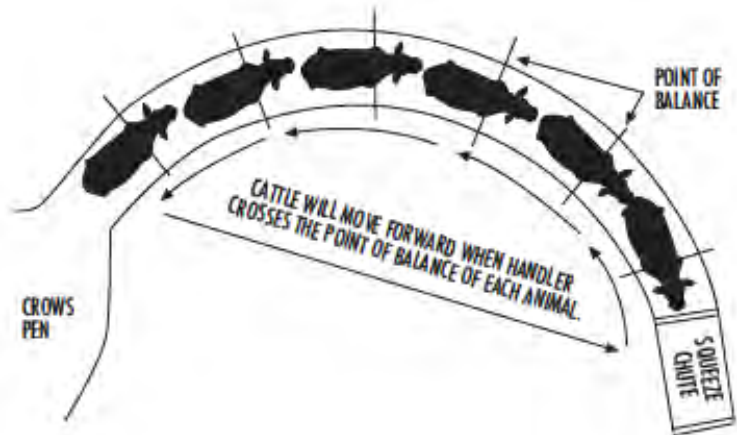
Point of Balance

A cow's point of balance is at the shoulder. The animal will move forward if the handler stands behind the point of balance; and backward if the handler is ahead of the point of balance.

Field of Vision

A cow can see nearly 90 per cent of the area around her. The only "dead spot" in her vision is

directly behind her, in the area between the hips. Imagine a straight line from the animal's eye to the pin bone. The animal can see everything outside this angle – disappear behind the hip past this line and they are unable to see you. The most common mistake made by handlers is inadvertent entry into the blind spot. Inevitably this causes cattle to stop and 'hook' – meaning they will turn to see you and stop. When a group of animals move, they maintain visual contact with each other. This enables the herd to stay together. The dominant strong animals will be at the core of the herd, while the weaker will remain more peripheral.



Flight Zone

An animal's flight zone is its personal space. Entering the flight zone will cause an animal to move away in an attempt to maintain the distance between the intruder and itself. The size of the flight zone will vary depending upon the animal. Animals that are used to close contact with humans such as those raised in a feedlot, or dairy cattle, will have a smaller flight zone than animals raised in an open pasture. Genetics may also make an animal more cautious about contact with humans. Recognizing the size of the flight zone helps to control how the animal will move. The handler must be close enough to the animal to make it move, but not so close as to cause it to panic and flee. If cattle move too fast, back out of their flight zone – if they slow too much – gently move back into the flight zone. Give the signal and reward the behaviour by releasing pressure.

Entry and exit of the point of balance and pressure to and from the flight zone is shown in the diagrams below.

A crowd pen should only be one-third or one-half full to allow cattle to find a point of exit more easily. If exit points are clearly lit and no handlers or 'strange objects' (a jacket flapping in the wind, for example) are visible within the flight zone at the exit points, cattle will flow freely in the desired direction.

Troubleshooting Handling Problems

To solve a handling problem, first determine the cause of the problem. Difficulties can arise from any one of the following factors:

1. Facility design problem – for example a dead-ended chute.

Share It!

If you have helped with processing or treating sick or injured cattle, share with the group what kind of cattle handling system was used and if there were any troubles when working with the cattle.

2. Dark spots in the chute cattle are expected to enter or moving into a dark building.
3. Too many animals in the crowding pen. Fill it no more than one-half full.
4. Handlers are frightening and scaring the animals.
5. Problems in animal temperament due to genetics.
6. Open or lighted spot directly beside exit point of crowding pen causing a distraction.
7. Animals stop movement because something appears unfamiliar to them, for example, a coat draped over a post.

Check It Out!

Watch the video produced by the Canadian Beef Research Council titled 'What Beef Producers Need to Know about Pain Control and Prevention' found at: <https://www.youtube.com/watch?v=nd9TTnKjCas>

Excerpts, Table and Diagram Credit: Manitoba Agriculture, Food and Rural Initiatives https://www.gov.mb.ca/agriculture/crops/production/forages/pubs/low_stress_livestock_handling.pdf

PAIN MITIGATION

The knowledge of pain in livestock has advanced steadily over the past 22 years. Behavioural and physiological indicators of pain have been identified, and researchers' ability to measure animal responses associated to painful procedures have improved. Research has developed new pain control drugs that are registered for use in cattle in Canada, and knowledge is building on the appropriate dosage, routes of administration and synergy between anesthetics and analgesics.

Despite a considerable amount of research, cattle's experience with pain is not fully understood. Research that has used electro-encephalographs to monitor brainwaves in cattle during painful practices detects clear differences, so it is clear that cattle experience pain, however as prey animals, cattle have evolved to not show behavioural signs of pain, which is a sign of weakness to predators

Most previous research into pain control for castration and dehorning has been done in dairy calves that were weaned at birth, or in feedlot calves. Little or no research has been done in young beef calves in a herd environment. Therefore, it's unknown whether the relief that beef calves get when they return to their mothers and nurse may also help to eliminate pain-associated behaviours.

More research is also needed to practically and effectively control pain in cattle. Many past studies have used drugs in ways that are difficult to implement in commercial practice. Some have used elaborate combinations of drugs, some of which are not licensed for use in cattle, or used experimental formulations that are not commercially available for cattle. Other experiments have repeatedly given the pain drugs over several days, requiring additional handling, stress and risk of injury for the cattle.

Did You Know?

Acute pain: short-lasting, intense pain
Chronic pain: less intense, longer lasting pain

Measuring Pain

To accurately mitigate pain, one must first know if the animal is experiencing pain and to what degree. Currently pain in animals can only be routinely measured using behavioural and physiological responses. Depending upon the management procedure being evaluated, researchers have used standing, lying, feeding, ruminating, kicking, tail-flicking, ear -flicking, pacing posture, and weight shifting behaviours to gauge animal responses to painful practices and pain control. These behaviours can be recorded, counted, and statistically compared. Acute, immediate pain is easier to measure than chronic, long-term pain (lasting more than 3 days).

Researchers have found that dehorned calves do more head rubbing, head shaking and ear- flicking than calves that have not been dehorned. Castrated calves stand, move and lie differently than calves that have not been castrated. Pain drugs alter these behavioural differences; feedlot bulls that are castrated using pain drugs show fewer of these abnormal, pain-related behaviours.

Painful Procedures

In Canada the most common routine management procedures that cause pain are castration, dehorning, and branding. Ongoing research is working to develop ways to reduce animals' experience of pain during these procedures or find effective alternative practices. These procedures are covered in detail in Section 2d: Code of Practice for the Care and Handling of Beef Cattle. Additionally, visit the National Farm Animal Care Council website at <http://www.nfacc.ca/codes-of-practice> for the most up-to-date information for pain mitigation.

Pain Mitigation Techniques

Ensuring that procedures are performed as early in the calf's life as possible, by a competent operator using clean, properly maintained tools, is the simplest way to reduce pain during painful routine management procedures. Use of anesthetics or analgesics can also help to control pain, especially in older animals. Work closely with your local veterinarian to develop a pain mitigation strategy that works on your farm.

Using Drugs for Pain Control

Few pain control options are commercially available for cattle, and all require a veterinary prescription. Anesthetic and analgesic drugs can help control pain. Anesthetic drugs (like freezing at a dentist) eliminate all feeling. Anesthetics (e.g. Lidocaine) help to reduce the pain of surgery, but wear off relatively quickly and are challenging to use. They need to

Check It Out!

Watch the video produced by the Canadian Beef Research Council titled 'Pain Mitigation in Beef Cattle' found at: <https://www.youtube.com/watch?v=HjslHbxLo20>

Talk About It!

Ensuring that procedures are performed as early in the calf's life as possible, by a competent operator using clean, properly maintained tools, is the simplest way to reduce pain during painful routine management procedures. What procedures are performed on cattle at your farm and at what age does your farm perform these procedures?

Reach Out!

Invite a veterinarian as a guest to your meeting to discuss pain mitigation in beef cattle. Find out when and how pain medication is administered to cattle.

be injected very carefully and precisely around the horn base or in the scrotum, so they may require more restraint so that the person with the needle doesn't accidentally inject him- or herself. Analgesics may be a better option for cattle producers. These don't eliminate all feeling, but do reduce the pain that occurs after the surgery. They can be injected intramuscularly or through intravenous methods and last longer than anesthetics.

Anesthetics need to be injected 5 to 20 minutes before an operation, and can provide several hours of pain relief. Injectable analgesics are longer-acting than anesthetics, and may provide some pain relief for up to a four days, depending on the drug administered.

A number of analgesic drugs have been approved for use in beef cattle. None of these products have a specific claim for pain control following castration, and few are approved for pain control during dehorning, but they do control swelling and pain for a variety of different conditions.

Age of Animal

Procedures are much less invasive in young animals. The wound is smaller, there is considerably less blood loss and young calves recover more quickly with a smaller setback in animal performance.

Although research is still being conducted in this area, it is suggested that to reduce pain, procedures should be conducted when animals are as young as possible, especially when dehorning because the horn bud attaches at 2-3 months of age.

Painful procedures should not be performed during times when the animal will be experiencing other stressors (e.g. don't castrate at the same time as weaning). Stress reduces the animal's immune system and makes them less able to fight off infection.

Further Research

Despite some advances in understanding pain in cattle, there is still much we do not understand when it comes to the effect and management of pain-associated procedures like castration and dehorning. It is important to note that beef cattle may respond differently to dehorning than dairy cattle due to their fear response to handling and restraint.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about beef animal handling through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

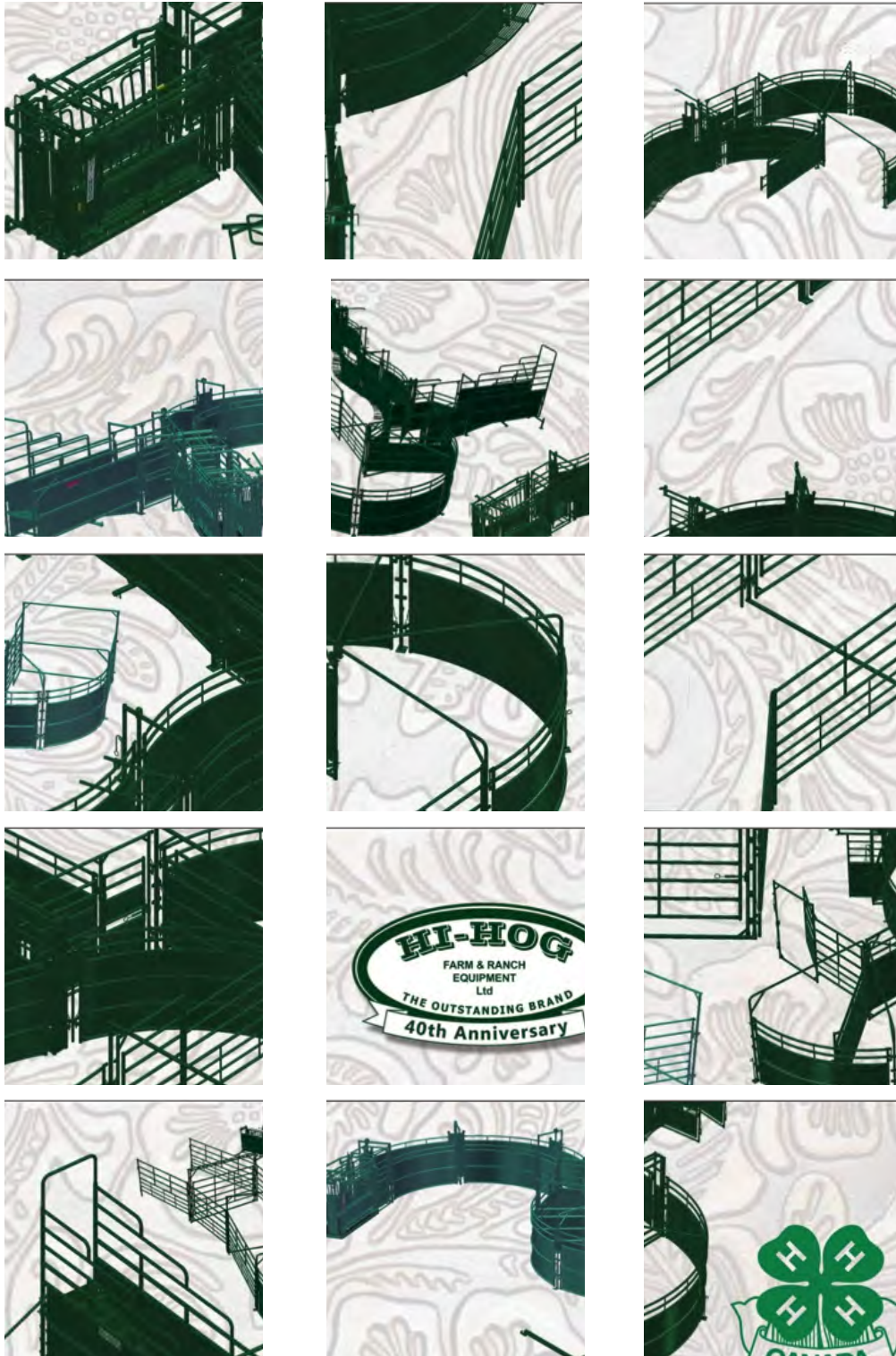
**ACTIVITY #1
HANDLING SYSTEM DESIGN**

<p>DO</p>	<p>Time: 20 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> - Handling System Design worksheets - Scissors <p>Instructions:</p> <ul style="list-style-type: none"> - Give each member a copy of each of the Handling System design worksheets - Explain the worksheets and have members cut out the squares and place them accordingly for a complete image of various cattle handling systems - Review the completed pages and discuss why the handling system is designed the way it is.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To allow members to think critically, in an experiential way, about how a cattle handling system is designed. This will allow members to better understand why cattle handling systems are designed the way they are.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Was it easy or hard to complete the puzzle? - Why is it important to be able to design a safe, low stress handling system for cattle? - Would you design the handling system different than what you created with the puzzle?

ACTIVITY #1 WORKSHEET – PAGE #1
HANDLING SYSTEM DESIGN

Instructions: Cut out the puzzle pieces and place them accordingly for a complete image of various cattle handling systems.

ACTIVITY #1 WORKSHEET – PAGE #2
HANDLING SYSTEM DESIGN



Credit: 4-H Alberta

AT HOME ACTIVITY

Looking through farm publications and on the Internet, find pictures of various cattle handling systems and create a poster showing these systems. Be prepared to show and explain the systems at the next meeting.

DIGGING DEEPER FOR SENIOR MEMBERS

Investigate the cost of various cattle handling systems. Compare the costs versus the equipment that comes with each system and decide which system is the best and safest system that will cause the lowest amount of stress for beef cattle at the most economical price. Keep in mind that the cheapest system is not necessarily the best!

SECTION 2C: PASTURE MANAGEMENT

SETTING OBJECTIVES:

Part of the life cycle for beef cattle is most often done on range and pasture lands. Management of this land is important for the health of the cattle, the health of the environment as well as economically for the beef farmer.

Suggested Lesson Outcomes

- To understand the difference between range and pasture land
- To be able to identify plants found on range and pasture lands
- To understand what factors can affect the productivity of range and pasture lands
- To gain an appreciation that there are plants that are poisonous to cattle
- To realize that crop residue has value as cattle feed
- To learn what different types of fencing are available

ROLL CALLS

- Name a plant you might find in a pasture field in your area.
- Name a plant that is poisonous to cattle.
- Name a crop that cattle can graze as crop residue.

SAMPLE MEETING AGENDA

Time: 2 hours 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Range or Pasture? Range and Pasture Management Range and Pasture Plants Stocking Rate Factors Affecting How the Land is Grazed Forage Values Grazing Systems Poisonous Plants Utilizing Cover Crops and Crop Residue Fencing	90 min + Activities
At Home Activity	Poisonous Plants	5 min
Wrap up, Adjournment & Social Time		10 min

NOTE: There is a lot of information in this section – it could be a four hour meeting or divided into two meetings at the discretion of the club leaders.

TOPIC INFORMATION RANGE OR PASTURE?

Some beef farms have both range and pasture land. But, they are not the same.

Pasture is....

land which grows plants put there by man. Pasture land is usually more productive than range land.

Range is...

land that is not suited for growing crops because it is too dry, rocky or rolling. Range land grows native plants; those which naturally grow in that area.

RANGE AND PASTURE MANAGEMENT

What is “managing your range or pasture”?

It is your plan for the care and use of your range and pasture land. This plan allows you to get the most product (meat, live animal) per acre of land while keeping the land in reusable condition. You want to make sure you do not harm the plants, soil and water of the land.

Without such a plan, your range and pasture would not stay in good condition and you would be unable to get the same return from it in the future.

Range and pasture management is much more than turning your cattle out to graze. Management is important for many reasons.

1. By caring for the land, you make the best plants grow at the fastest rate. These plants are harvested by the animal, turning the plant into products which provide an income for the farm.
2. With good management, you will always have a reserve of feed. If the cattle are not controlled, they will graze and overgraze the land, eventually killing many of the popular plants. Those plants which are not liked by the animals and are usually the least valuable, will grow and take over the pasture, reducing its quality.
3. With good management, you can keep a good plant cover. The grasses and plants will have strong root systems. This plant cover will help to protect the soil from erosion.

GOOD RANGE AND PASTURE MANAGEMENT

To give your range and pasture land good management, follow these rules:

1. Use the right season for grazing.

Some plants are cool season grasses. They begin to grow early in the spring. Warm season plants do not begin to grow until the weather becomes warmer.

Discuss It!

Is there more pasture land or range land in your area?

In the spring, allow the plants to grow to a height of 15 cm before you put your cattle out to graze. If there are lots of legumes, such as alfalfa and clover, allow them to grow to a height of 25 cm.

2. Use the right number of animals.

Do not let too many animals graze any area. Change the number of animals grazing your land so that half of the annual grass is left at the end of the grazing season.

Remember that the green leaves make the food for the roots to grow. It takes grass to make grass.

3. Use the right amount of time for grazing.

Good grazing must include a rest period for the plants. Once the plants and grasses are down to 8 cm in height, move the cattle to another area.

4. Know the range and pasture plants.

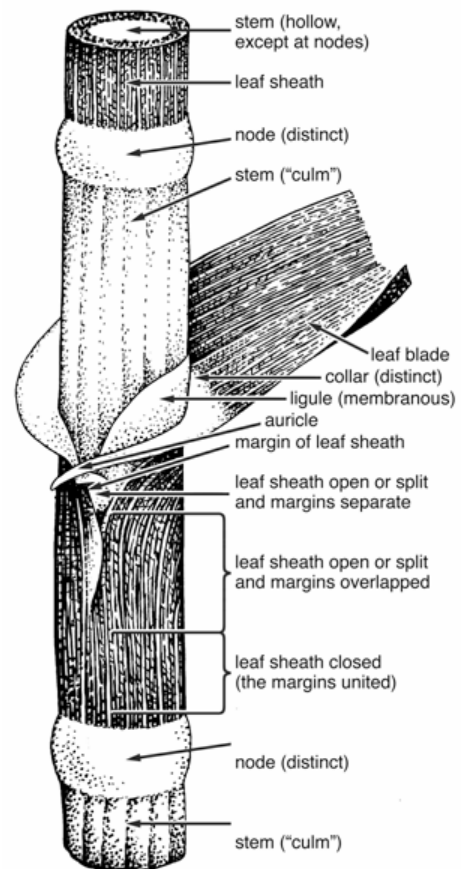
It is important to be able to recognize plants which are poisonous and can harm your livestock. You will need to get rid of them or fence them out.

RANGE AND PASTURE PLANTS

Many different types of plants grow on our land. These plants differ in their appearance growth habits. Plant groups include:

1. **Grasses** are the most important range and pasture plant group. They supply most of the feed for our cattle. They have hollow, jointed stems and the leaves are in two rows on the stem. Veins on the leaves are parallel. Examples are meadow fescue, timothy, smooth brome grass, orchard grass and ryegrass.

Grasses are an important component of pastures in Ontario. In mixed legume and grass pastures, the grasses reduce the danger from bloat, help to keep weeds out and improve the chances of stands surviving the winter. Grass pastures can supply good yields of quality feed, and the wide selection of grass species means that there is a grass to suit almost any growing condition or management need.



Credit: OMAFRA Factsheet: Pasture Grasses Identified <http://www.omafra.gov.on.ca/english/livestock/beef/facts/06-095f1.png>



Orchard Grass



Timothy



Smooth Brome Grass

Credit: OMAFRA Factsheet Pasture Grasses Identified <http://www.omafra.gov.on.ca/english/livestock/beef/facts/06-095f11a.png>

2. **Grasslike** plants look like grass but they do not have a hollow stem and the stem is not jointed. Veins in the leaves are usually net like. They include Sedges (triangular stems) and Rushes (round stems).
3. **Forbs** are non-grassy plants with annual stems or tops. They include range weeds and flowers. Examples are gumweed, skelton, tapertip hawksbeard, bull thistle and tumbling mustard.
4. **Shrubs** are woody plants with stems and buds which winter above the ground and stems which branch near the base of the plant. Examples are sagebrush, wolf willow, rabbitbrush and bitterbrush.
5. **Legumes** are plants with flowers like the sweet pea and produce their seeds in pods. Compared to grasses that have long slender leaves, legumes have compound leaves with three or more broad, rounded leaflets. Most legumes have tap roots that are able to obtain water from deeper in the soil than the roots of grasses. Legumes are highly valued because they are rich in protein and yield well without being fertilized with nitrogen. This is because legumes are able to form a mutually beneficial relationship with Rhizobia bacteria. In this association, the bacteria, which live in nodules or swellings on the legume roots, are able to fix atmospheric nitrogen and make it available to their host plant. Several legume species are used in Ontario. Examples are alfalfa, clover and trefoil.



Alfalfa



Red Clover



Birdsfoot Trefoil

*Image credits: OMAFRA Factsheet: Pasture Legumes
Identified <http://www.omafra.gov.on.ca/english/crops/facts/04-057f1.jpg>*

STOCKING RATE

One part of good range and pasture management is having the right stocking rate on the land. The stocking rate is the number of animals which should graze on the land to make it most productive. If the stocking rate is too high, the animals will overgraze the plants and the land quality will be reduced. If it is too low, you are not making the best possible use of your resources.

How is stocking rate determined for range or pasture land?

1. Measure the forage production on the land where you want to put your cattle.
 - a. Mark off a circle with a 56 cm radius using a 56 cm piece of string with a large nail on each end.
 - b. Inside this circle, clip all the forage at ground level.
 - c. Let the forage sample dry. Weight it in grams.
 - d. Determine the amount of forage in kilograms per hectare (2.47 acres) by multiplying the weight in grams by 10.

Example: If the forage you collected weighed 85 grams, there would be $85 \times 10 = 850$ kilograms of forage on one hectare of this land.

The number of acres needed to provide forage for one animal (also called an animal unit (AU)). An animal unit is considered to be a mature cow. A bull, because of his larger size, is considered to be 1.3 AU. A weaned calf is considered to be only 0.5AU.

2. Determine the Animal Unit Month – the amount of forage each animal unit will graze in one month.

A mature cow needs about 12 kg of forage each day. Multiply 12kg by the number of days in the month, say 30.

$$12 \times 30 = 360$$

Add in a factor of 25% to allow for trampling and waste.

$$360 \times 25\% = 90$$

$$90 + 360 = 450$$

Judge It!

Set out four pasture plants of the same kind from different pasture fields. Discuss what the plant should look like for the particular time of year. Place the plants first through fourth and give reasons for these placings.

Experience It and Test Yourself!

Take a walk through a range or pasture field. Identify range and pasture plants. If there is a plant that you cannot identify, take a picture and research as to what it is.

Do It!

Using the instructions listed in #1 (to the left) measure the forage production in a field on your farm. If you don't have a field to do this activity, ask a neighbouring farm for permission to do this on their farm. Take pictures as you do the activity and document your findings. Be prepared to share your findings at the next meeting.

Therefore, we need 450 kilograms of forage per AUM or per animal per month.

Example: In our example above, the pasture produced 850 kg of forage. Remember that it is good management to adjust the stocking rate so that half of the annual grass is left after grazing.

$$850 \times 0.5 = 425$$

Therefore, there are 425 kilograms per hectare of forage available to be used by the cattle.

3. Determine how many days it would take one AU needing 12 kg of forage per day to graze one hectare. Remember to include an extra 25 percent to allow for trampling and wastage.

Example: In our example, 425 kg of forage is available.

$$425 : (12 \times 1.25) = 28 \text{ days}$$

Therefore, it would take one AU about 28 days to graze one hectare of land.

4. Determine the stocking rate for your area of land.

Example: Suppose we have 20 hectares of land. We would be able to put 20 AU of beef cows out to graze this land for 28 days or 4 weeks. If we had 40 cows to pasture, we would have to move them to another area after 2 weeks.

The amount of forage produced and available to your cattle varies each year. It depends on the soil, topography, climate and condition of pasture. Because it can vary in land close by, it is important to determine the stocking rate for each pasture of your operation.

FACTORS AFFECTING HOW THE LAND IS GRAZED

Many factors affect how the animals will graze the land. Some of the most important factors are:

1. **Type of Vegetation** – cattle naturally graze first on the plants they like best. They change their grazing preferences as nutritional value and palatability of plants change.
2. **Location of Water** – the distance from the water supply to the grazing area will affect where the cattle will graze. They will overgraze the land closer to the water supply.
3. **Size and Shape of the Pasture** – a long, narrow pasture running north and south would be grazed in the most travelled area and less grazed farthest from the entrance to the pasture.
4. **Climatic Conditions** – the direction of the prevailing winds will affect where the cattle graze. Land with little protection from the weather will be less grazed.
5. **Number of Animals** – as we have already learned, the number of animals will affect how

the pasture is grazed.

FORAGE VALUES

Farmers need to know whether their cattle like the plants growing on their land. They also need to know the nutritional value these plants can supply.

We classify plants according to their value to the cattle (also called their grazing value). They can be good, fair or poor. The grazing value depends on:

- Palatability (how well the cattle like them)
- Nutrient content
- Volume of the forage
- Whether or not the plants are dangerous.

Keep in mind that the value of any plant differs for each type of grazing animal (i.e. cattle, horse, sheep, etc.)

The following table describes the degrees of land use:

Range and Pasture Use Guide

DEGREE OF USE	DESCRIPTION
1. Unused	No evidence of any use by livestock
2. Light	Only the most palatable plants are used and they are only slightly grazed
3. Moderate	About half of the season's growth of good and fair forages are grazed
4. Heavy	Land has a clipped or mowed appearance and more than half of the good and fair forages are eaten
5. Destructive	Pasture appears to be stripped of vegetation, tramping is obvious and even the poor forages have been grazed

GRAZING SYSTEMS

Grazing management involves creating a balance between the number of animals, their distribution over the range or pasture and the availability of forage.

The amount of forage produced and available to the livestock varies from year to year and among different land areas. Therefore, the timing, location and duration of grazing are an important part of your management program.

Livestock producers use a plan or schedule to determine where and when livestock graze. This plan is called a Grazing System. The purpose of a grazing system is to maintain or improve the condition of the range or pasture while at the same time achieving a high level of livestock production.

Communicate It!

Have you seen a range or pasture field that would be considered destructive on the above scale? What factors contributed to the destructive use of the field? (i.e. too many cattle, wet conditions, drought)

There are many advantages for planning a grazing system:

1. Each pasture has an opportunity to set seed, replenish its food reserves and improve its condition.
2. Grazing is more uniform because the cattle are better distributed when on concentrated pastures.
3. Reserve grass is always available in case of drought.
4. Breeding efficiency and calving percentage usually improve when cattle are closely confined.
5. Improved range condition and more grass lead to increased weaning weights.
6. Cattle are easier to manage.

There are many different grazing systems which can be used. The two most popular are the continuous and the rotational grazing systems.

Continuous Grazing System

In the continuous grazing system, livestock are allowed to graze the land throughout the growing season. They are turned out in early May and removed in late October. The cattle graze and re-graze favourite plants and areas of the range or pasture. This causes the best plants to be killed and an overall lower forage yield on the land. The area of pasture deterioration increases each year.

The continuous grazing system is designed for the livestock producer's convenience. It has these advantages.

- Minimum handling and moving of cattle required
- Cattle are allowed to select their forage early in the season when plants are most nutritious



Continuous Grazing

Credit: Statistics Ag Canada - Manitoba Co-operator https://static.agcanada.com/wp-content/uploads/sites/5/2017/12/nrcs_menoken_grazing1000.jpg

The continuous grazing system is not designed to meet the needs of the plants or the animals.

Rotational Grazing System

In the rotational grazing system, the range is separated into fields and the animals are moved or rotated among the fields. Cattle are rotated so that all areas of the range receive at least one rest period during the year.



Rotational Grazing

Credit: Gallagher Fencing <https://am.gallagher.com>

Rotational grazing systems allow the increased production of forages.

The land is rested to allow forages to store food

in their roots and/or make their seeds. Better forage utilization is achieved and the pasture supports more animals during a shorter grazing season.

Many livestock producers hesitate to use rotational grazing systems because:

- More labour is required to move cattle
- There may be no water supply in some areas
- It can be costly to fence

Deferred Grazing System

Deferred grazing is delayed grazing. The cattle are not allowed to graze until after the seeds have matured. The longer the beginning of grazing on a pasture can be delayed, the better the opportunity for new plants to become established. Producers often use a deferred system in combination with a rotational grazing system.

There is no formula to tell you which grazing system will best for you, your cattle and your land. Each area must be looked at individually. Consider all of these:

- Soil type
- Vegetation types
- Types and numbers of livestock
- Needs and capabilities of the land

Discuss It!

Which grazing system do you think is best? Discuss the pro's and con's of each system.



POISONOUS PLANTS

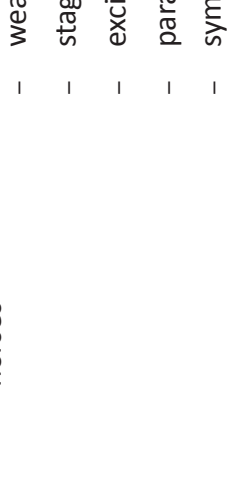
Many common weeds in Ontario can poison livestock. The chart below identifies these weeds and describes the symptoms of poisoning. Because some poisons act very fast (as with the hemlocks) by the time the symptoms are evident, the chances of saving the animal are very slight. It is, therefore, important to learn to recognize these weeds beforehand and prevent poisoning from occurring. Most of these weeds can be controlled chemically or mechanically. In some cases, it may be more practical to simply fence off infested areas so that the animals do not have access to particularly hazardous weeds.

It should be noted that most of these weeds are unpalatable and animals will usually not graze them if given the choice. One of the most important steps in preventing animal suffering or loss is good pasture management. Keeping the desirable forage species producing throughout the grazing season will reduce the possibility of animals grazing poisonous weeds.

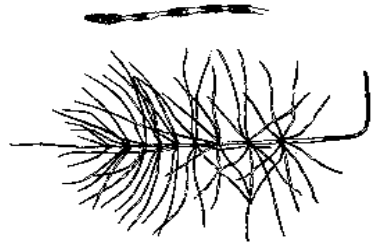
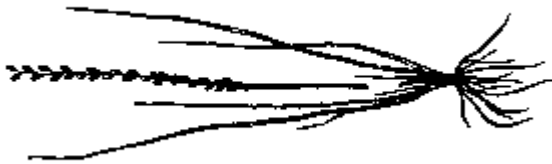
If symptoms of poisoning should occur, it is recommended that you call your veterinarian as soon as possible.

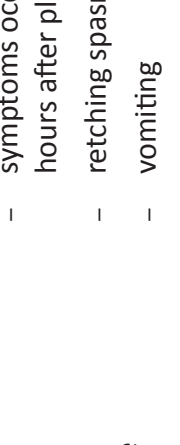
Common Weeds Poisonous to Grazing Livestock

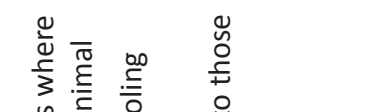

Weed	Where generally located	Livestock affected	Symptoms
Poison Hemlock* <i>Conium maculatum</i> 	<ul style="list-style-type: none"> - waste areas - road sides - dry ditches 	<ul style="list-style-type: none"> - cattle - horses - sheep - goats 	<ul style="list-style-type: none"> - death may occur within 15 minutes - frothing at the mouth - uneasiness - pain - dilated pupils - clamping of jaws - grating of teeth - vomiting - weak, rapid pulse - diarrhea - bloating - convulsions - respiratory failure - death
Water Hemlock* <i>Cicuta maculata</i> 	<ul style="list-style-type: none"> - wet pastures - stream banks - pond edges - lake edges - wet ditches - edges of wet woods 		

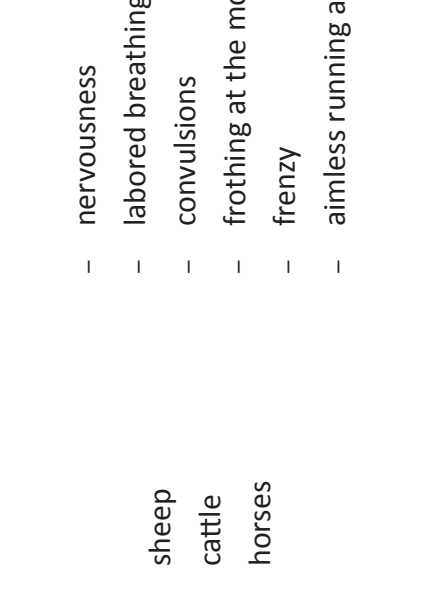

Weed	Where generally located	Livestock affected	Symptoms
<p>Bracken Fern* <i>Pteridium aquilinum</i></p> 	<ul style="list-style-type: none"> - open fields - woodlands - low ground - dry, rocky soil 	<ul style="list-style-type: none"> - horses 	<ul style="list-style-type: none"> - symptoms are slow to develop - loss of flesh - jaundice - loss of appetite - weakness - staggering gait - excitability - paralysis - symptoms are slow to develop - high fever - labored breathing - drooling - hemorrhaging from nostrils - blood in urine and feces - convulsions



Weed	Where generally located	Livestock affected	Symptoms
Marsh Arrow-Grass <i>Triglochin palustris</i>	<ul style="list-style-type: none"> - marshes - alkaline soils 	<ul style="list-style-type: none"> - cattle - sheep 	<ul style="list-style-type: none"> - symptoms appear rapidly - rapid, difficult breathing - almond odor to breath - animals go down with head turned to one side
Horsetail* <i>Equisetum arvense</i>	<ul style="list-style-type: none"> - poorly drained soils - low, sandy, acid soils - cultivated fields - roadsides - waste areas - woods 	<ul style="list-style-type: none"> - horses - cattle - sheep 	<ul style="list-style-type: none"> - symptoms are slow to develop - jaundice - loss of appetite - weakness - staggering gait - excitability - paralysis





Weed	Where generally located	Livestock affected	Symptoms
Pokeweed* <i>Phytolacca americana</i>	 <ul style="list-style-type: none"> - (southern Ontario only) - waste areas - meadows - edges of woods 	<ul style="list-style-type: none"> - cattle 	<ul style="list-style-type: none"> - symptoms occur two or more hours after plants are eaten - retching spasms - vomiting - purging - convulsions
Marsh Marigold* <i>Caltha palustris</i>	<ul style="list-style-type: none"> - wet areas 	<ul style="list-style-type: none"> - cattle 	<ul style="list-style-type: none"> - acute inflammation of the gastro-intestinal tract - vomiting - colic - bloody urine - diarrhea - twitching of the eyelids - weak pulse - loud breathing - reduce milk production - tainted milk red in colour and bitter tasting

Weed	Where generally located	Livestock affected	Symptoms
<p>Tall Buttercup* <i>Ranunculus acris</i></p> 	<ul style="list-style-type: none"> - pastures - meadows - roadsides 	<ul style="list-style-type: none"> - cattle - horses - sheep - goats 	<ul style="list-style-type: none"> - inflammation and blisters where plant juice touched the animal - mouth blisters cause drooling and loss of appetite - other symptoms similar to those for marsh marigold
<p>Wild Cherries Black <i>Prunus virginiana</i> #Choke ##Pin</p> 	<ul style="list-style-type: none"> - fence rows - open woods 	<ul style="list-style-type: none"> - cattle 	<ul style="list-style-type: none"> - same as with march arrow-grass poisoning

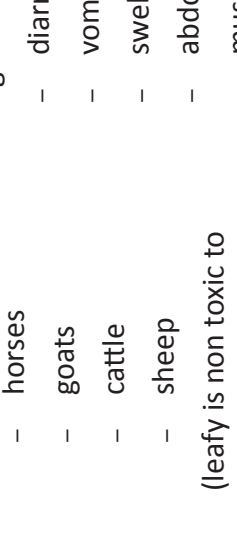
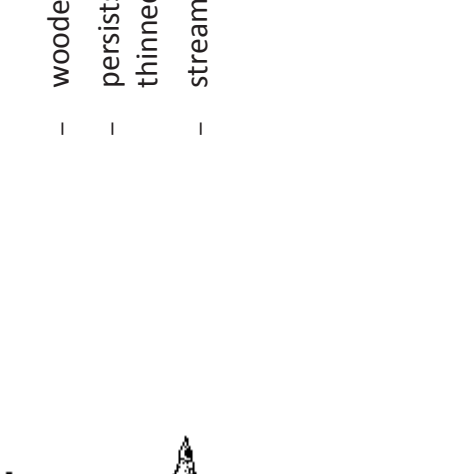
Weed	Where generally located	Livestock affected	Symptoms
<p>Lupine <i>Lupinus polyphyll</i></p> 	<ul style="list-style-type: none"> - pastures - meadows - roadsides - waste areas 	<ul style="list-style-type: none"> - sheep - cattle - horses 	<ul style="list-style-type: none"> - nervousness - labored breathing - convulsions - frothing at the mouth - frenzy - aimless running about
<p>Saint-John's Wort* <i>Hypericum perforatum</i></p> 	<ul style="list-style-type: none"> - roadsides - pastures 	<ul style="list-style-type: none"> - horses - cattle 	<ul style="list-style-type: none"> - photo-sensitivity - inflammation of the unpigmented portion of the skin - affected area becomes sore and reddened and may peel - tongue and mouth may be affected

Weed	Where generally located	Livestock affected	Symptoms
Nightshade* <i>Solanum sp.</i>			
#Eastern Black			
##Black Hairy Climbing			
	<ul style="list-style-type: none"> - open dry woods - cultivated fields - pastures - fence rows - waste areas - farm yards 	<ul style="list-style-type: none"> - cattle - horses - sheep - goats 	<ul style="list-style-type: none"> - abdominal pain - stupidity - dilation of pupils - loss of appetite - diarrhea - loss of muscular coordination - unconscious - death
Jimsonweed <i>Datura stramonium</i>			
	<ul style="list-style-type: none"> - cultivated fields - farm yards 	<ul style="list-style-type: none"> - cattle - horses - sheep - goats 	<ul style="list-style-type: none"> - dilation of the pupils - impaired vision - fast, weak pulse - nausea - loss of muscular coordination - violent, aggressive behaviours - trembling - milk is tainted

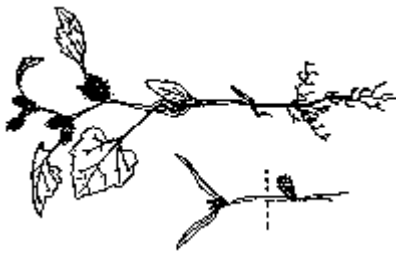
Weed	Where generally located	Livestock affected	Symptoms
Milkweed* <i>Asclepias sp.</i> #Whorled ##Common			
			
	- dry, open areas - pastures - around woods - roadsides - waste areas - cultivated fields	- cattle - sheep	- loss of appetite - constipation - drooling - excitable - difficult breathing - rapid, weak pulse - convulsions - death
Cockle* <i>Saponaria officinalis</i> #Purple Cockle ##Cow Cockle Bouncingbet			
			
	- pastures - cultivated fields - roadsides - waste areas	- horses - cattle	- restlessness - grinding of teeth - drooling - colic - diarrhea - rapid breathing - weak pulse - coma - death
		- horses	- persistent colic

Weed	Where generally located	Livestock affected	Symptoms
Laurel <i>Kalmia sp.</i> Sheep Pale or Bog	<ul style="list-style-type: none"> - bogs - wet evergreen woods 	<ul style="list-style-type: none"> - cattle - sheep - goats 	<ul style="list-style-type: none"> - drooling - watery eyes - runny nose - vomiting - complete or partial blindness - drowsiness - convulsions - paralysis
Tansy Ragwort* <i>Senecio sp.</i>	<ul style="list-style-type: none"> - pastures - hayfields - waste areas - roadsides 	<ul style="list-style-type: none"> - horses - cattle 	<ul style="list-style-type: none"> - nervousness - chills - pale mucous membranes - loss of coat lustre - strong, rapid pulse - high temperature - staggering gait - weakness - death



Weed	Where generally located	Livestock affected	Symptoms
<p>Spurge* <i>Euphorbia sp.</i> Cypress Leafy</p>			
	<ul style="list-style-type: none"> - cultivated fields - waste areas - roadsides 	<ul style="list-style-type: none"> - horses - goats - cattle - sheep <p>(leafy is non toxic to sheep)</p>	<p>Contact with sap:</p> <ul style="list-style-type: none"> - causes inflammation of skin <p>Eating causes:</p> <ul style="list-style-type: none"> - diarrhea - vomiting - swelling around mouth and eyes - abdominal pains - muscle tremors - sweating - tainted milk has reddish colour, bitter taste
<p>White Snakeroot <i>Eupatorium rugosum</i></p>			
	<ul style="list-style-type: none"> - wooded areas - persists after woods are thinned out - stream banks 	<ul style="list-style-type: none"> - horses - cattle - goats - sheep 	<ul style="list-style-type: none"> - depression - inactivity - arched body - hind feet place close together - excessive salivation - nasal discharge - nausea - rapid, labored breathing - above, except sheep stand with legs apart

Weed	Where generally located	Livestock affected	Symptoms
Cocklebur* <i>Xanthium chinensis</i>	<ul style="list-style-type: none"> - cultivated fields - stream banks - beaches - farm yards 	<ul style="list-style-type: none"> - horses - cattle - sheep 	<ul style="list-style-type: none"> - symptoms appear within a few hours - weakness - unsteady gait - twisting of neck muscles - depression - nausea - vomiting - labored breathing - rapid, weak pulse - death
Sneezeweed <i>Helenium autumnale</i>	<ul style="list-style-type: none"> - wet areas - roadside ditches - stream banks 	<ul style="list-style-type: none"> - cattle - horses - sheep 	<ul style="list-style-type: none"> - symptoms are slow to develop - loss of vigor - loss of flesh - rapid pulse - labored breathing - loss of muscular control - drooling - high temperature - dizziness - spasms - convulsions



Weed	Where generally located	Livestock affected	Symptoms
#Squirrel Corn ##Dutchman's Breeches <i>Dicentra sp.</i>	<ul style="list-style-type: none"> - wooded areas (maple woods) 	<ul style="list-style-type: none"> - cattle 	<ul style="list-style-type: none"> - symptoms develop 48 hours after plants are eaten - trembling - frothing at the mouth - vomiting - diarrhea - labored breathing - convulsions



Credit: OMAFRA Factsheet: Common Weeds Poisonous to Grazing Livestock <http://www.omafra.gov.on.ca/english/livestock/dairy/facts/poisonousweeds.htm>

You can avoid losses by poisonous plants by:

- Being able to recognize these plants
- Knowing the conditions or circumstances under which the plants can be most dangerous
- Not turning your cattle out too early on inadequate forage where poisonous plants are the only green feed
- Keeping your land in good condition
- Not allowing your cattle to become too hungry
- Providing adequate mineral and salt (cattle lacking salt may be attracted to the poisonous plants)
- Eliminating the poisonous plants
- Fencing out the poisonous plants
- Not moving cattle over land which contains poisonous plants

UTILIZING COVER CROPS AND CROP RESIDUE

With some planning and action in August there can be lots of opportunity to extend the grazing season through to early winter or in some cases late winter.

Graze Corn Stalks

Do you have the opportunity to use any crop residue for winter forage? If you have access to grain cornfields they can provide feed for several months during the winter. Cows can winter quite successfully on corn stalks. They will glean any grain that has been missed by the combine and the leaves and stalks provide reasonable feed value. An electric wire will allow you to control the area that is grazed and make for an easy feeding system for part of the winter. Cows can graze through fluffy snow that is 8-12 inches deep.

Stockpile Grazing

Stockpile grazing refers to grazing the late-summer and fall growth in a field after the growing season ends. Cattle and sheep can successfully graze through several inches of fluffy snow. Select fields with firm soil conditions and a good accumulation of



Fall and Winter Grazing

Credit: OMAFRA Fall Pasture Management Tips
[http://www.omafra.gov.on.ca/english/livestock/
beef/news/vbn0804a6f1.jpg](http://www.omafra.gov.on.ca/english/livestock/beef/news/vbn0804a6f1.jpg)

forage growth. Animals should be given access to only part of the pasture area at a time so that they consume most of the available forage, rather than picking out only the best. Fields that are stockpile grazed will be slightly slower to become productive in the spring. The savings gained by not having to harvest and store the forage will more than offset this loss of early spring growth.

Trefoil is one of the better legumes for stockpile grazing as it holds its quality well into the late fall and early winter. Trefoil is a short-lived perennial that can re-seed itself if allowed to flower and fully develop the seedpods. If you have trefoil in your pasture it should be allowed to flower and set seed at some point during the year. If the trefoil has not had the opportunity to do so up to this point in time, then give it a fall rest to allow seed set. The trefoil can then be grazed later in the season after all growth has ceased.

There are a number of options that may fit your livestock operation that will help keep costs down and can be used to improve the productivity of your pastures. Consider your needs and opportunities and choose the ones that will work for you.

FENCING

Fencing Types

Page Wire

Page wire fencing is a permanent fencing type, available in a wide range of fence heights and horizontal spacing, usually constructed on the farm/field perimeters to control livestock, protect crops and enclose pastures; the nine-strand, 1,200 mm (48 in.) high fence is very popular. The ideal fence height and spacing will depend upon the type of livestock to be excluded. Often a single strand of barbed wire is installed on the posts above the page wire fencing, especially where animals, i.e., horses, tend to reach over the fence. Anchor, corner and stretch posts must be wood, but line posts may be wood and/or steel. Use either a long-lasting wood post such as cedar or a pressure-treated post for maximum life. Post spacings are usually 5 m (16.5 ft). Post lengths will depend upon the choice of page wire fencing height; normally a 2.4 m (8 ft) long post with approximately 1.5 m (5 ft) of post above ground is required to exclude cattle and horses. Page wire fencing is very visible to the animals being excluded. This fencing system is normally more costly to construct than other types, due to higher costs for fencing materials and labour.

Talk About It!

Does anyone graze cattle on cover crops or on crop residue in your area? Have you done this on your own farm? Do you think this is a practical method of feeding beef cattle?

Reach Out!

Invite a beef producer that grazes cattle on corn stalks or other types of crop residue or cover crops in the fall as a guest speaker. Find out why they chose to do this, how well it works and if there is anything they will change in future years.

Experience It!

Go on a pasture tour (either organized by a local fencing company or organized as a 4-H beef club tour) to see various types of fencing. Be prepared to ask the owner of the pasture questions about how the fencing works, if they like it and if there is anything they would like to change about their fencing system.

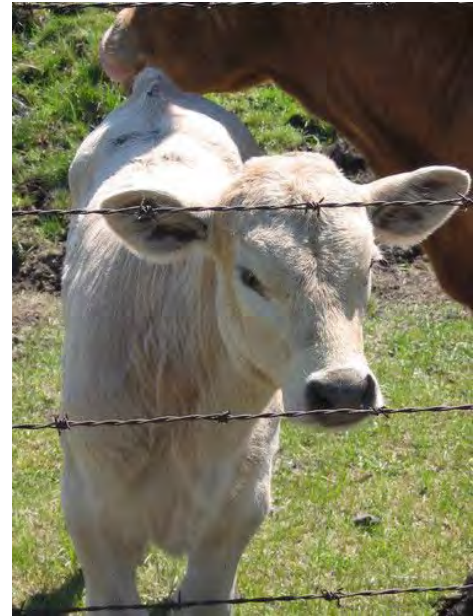


Credit: University of Guelph <https://www.uoguelph.ca/fare/files/Beef-Cattle-Agriculture.jpg>

Barbed Wire

The more traditional barbed wire fencing consists of four strands of barbed wire stretched on posts approximately 5 m (16.5 ft) apart. Either the double-strand type of wire or the single-strand type may be used. The barbed wire is stretched tight during installation and stapled securely to each post. This four-wire fencing system normally would have the bottom wire 30 cm (12 in.) above the ground and each subsequent wire spaced at 25-30 cm (10-12 in.) intervals, depending on the animals being excluded.

A barbed wire fence is used where a greater repelling action against livestock is required. It is more difficult to handle than other types, because of the barbs, and more susceptible to permanent damage, sagging and failure because it is tightly stapled at each post. It may also contribute to an increased risk of animal injury. A four-wire fence will not have close enough spacing on the wires for small animals.



Credit: <https://i.pinimg.com>

Suspension (High Tension)

In a suspension fence, the wires move freely between the posts. Impact by an animal creates a whipping action along the fence, discouraging animals from reaching through the fence. Very little of the wire's weight is carried by the line post, while the brace posts absorb the force. Posts are typically placed 9 m (30 ft) apart but can be placed further apart on level ground. Metal or wood droppers placed at 4.5 m (15 ft) intervals space the wires along the fence line. The suspension fence is most effective on level land and has limited application on rough land. It is faster and less expensive to construct than page wire. Single-strand barbed wire and 12.5-gauge smooth wire are used, with the bottom wire usually located 30 cm (12 in.) above the ground. Both fence types require little upkeep.

Smooth Wire Suspension (12.5-gauge high-tensile)

This fence type is versatile and usually has five or more wires. It has more elasticity than barbed wire and is easy to install with the use of a wire spinner. Often used where electric fence is not suitable, such as in urban areas, smooth wire suspension is stronger and easier to install than

barbed wire suspension, although it may not be as effective in controlling cattle because of the lack of barbs. Often one or two wires of a smooth wire suspension fence are electrified when built in non-urban areas.

Barbed Wire Suspension

A barbed wire suspension fence can be more effective than smooth wire in controlling some animals, but is more time consuming and tedious to construct. Barbs will catch on the staples, reducing the whipping action, and there is an increased risk of injury to both the fence builder and the animals. Never electrify barbed wire suspension fencing as there is a danger to animals trapped for a significant length of time.



Credit: <https://pasturemgmt.com>

Electric

Electric fencing can be built as permanent or non-permanent. Electric fencing can extend the life of a page wire fence. The high cost and labour of installing and maintaining traditional fences has made electric fencing more attractive.

Proper grounding and fence maintenance are important for the fence to carry an effective charge. Consider using a back-up power source. Solar energy is occasionally used to power the fence. Check with municipal bylaws for regulations on electric fencing.



Credit: OMAFRA <http://www.omafra.gov.on.ca/english/livestock/beef/news/vbn0516a2f1.jpg>

Training

Electric fencing works as a psychological rather than a physical barrier. It works best when the livestock have been trained to adapt to the fence. Place a charged wire inside the barnyard fence and leave the livestock there to learn about electric fences before putting them out to pasture.

How Does it Work?

A power source, either hydro- or battery-operated, provides a current. Wire carries the current along the fence, and a ground completes the circuit.

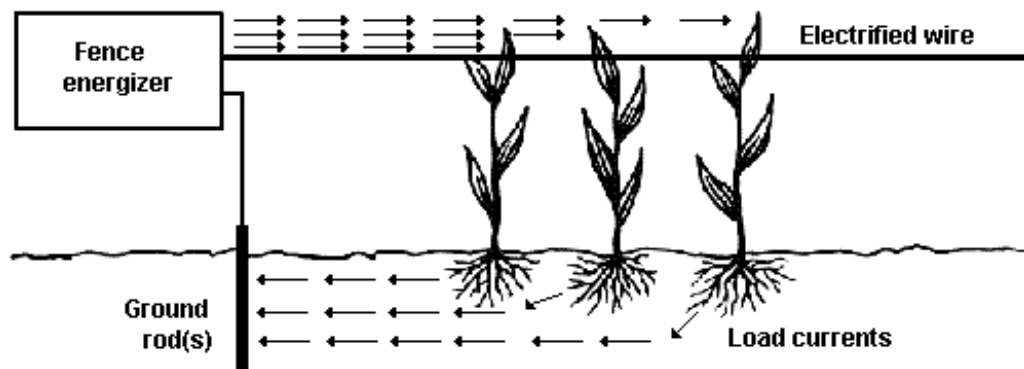
An electric fence line with no vegetation touching it requires very little power to maintain high voltage levels. Every plant in contact with a live wire will draw a small amount of current to the ground. With miles of wire, this drain can reduce the effectiveness of the fence. Normally, a fence will have contact with some plant growth; this is referred to as the fence load.

Permanent Electric Fence

Permanent electric fence has two or more 12.5-gauge, high-tensile wires. The number of wires will depend on the type of animals being confined. A predator control fence will require more wires. Posts may be placed at 9 m (30 ft) intervals or greater, depending on topography, with droppers, if required, at 4.5 m (15 ft).

Non-Permanent Electric Fence

A non-permanent electric fence is often used for subdividing a field for pasture rotation. Polywire, 14 or 16-gauge smooth wire or polytape are suitable for temporary fencing. This fence is easy to set up and take down. Plastic or fibreglass posts are quite suitable.



(Diagram courtesy of Winterburn Enterprises). <http://www.omafra.gov.on.ca/english/engineer/facts/08-035.htm>

Judge It!

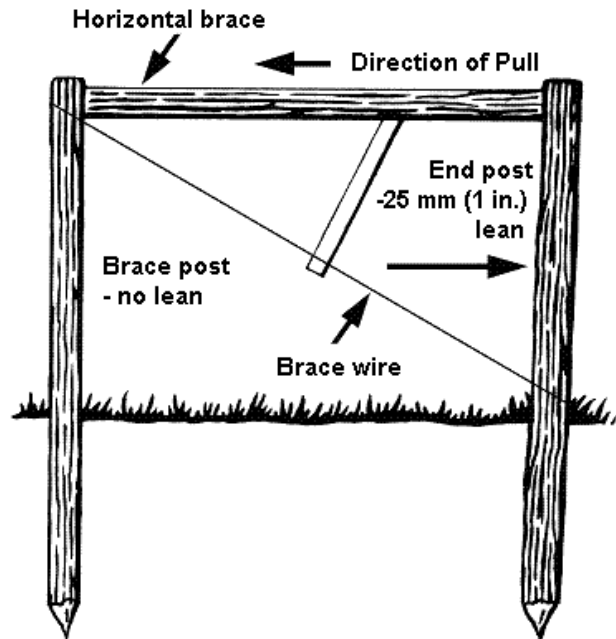
Have four of the same item available for judging that would be used for fencing (insulators, tighteners, steeples, fencing pliers, etc.). After discussing what the item does and what it should look like, place the items in order from first through fourth and give reasons for these placings.

An electric impulse travels from the fence energizer along the wire to plant/animal to ground-to-ground rods and back to the energizer

FENCING - BRACE ASSEMBLIES

Corner and end brace assemblies are the foundation of the fence. An entire fence may fail if the brace assembly is not adequate. Suspension fencing relies totally on the brace system to provide support.

The brace assembly shown below has been found to be the most popular type of end-brace assembly. This design has adequate strength, is easy to build and is aesthetically pleasing. For a strong brace assembly, use minimum 150 mm (6 in.) top diameter brace posts, driven 1.2 m (4 ft) into the ground in firm soil, deeper in soft soil. A top horizontal brace should be twice as long as the height of the post above ground but never less than 2.4 m (8 ft). Install a twitch or brace wire diagonally between the posts.

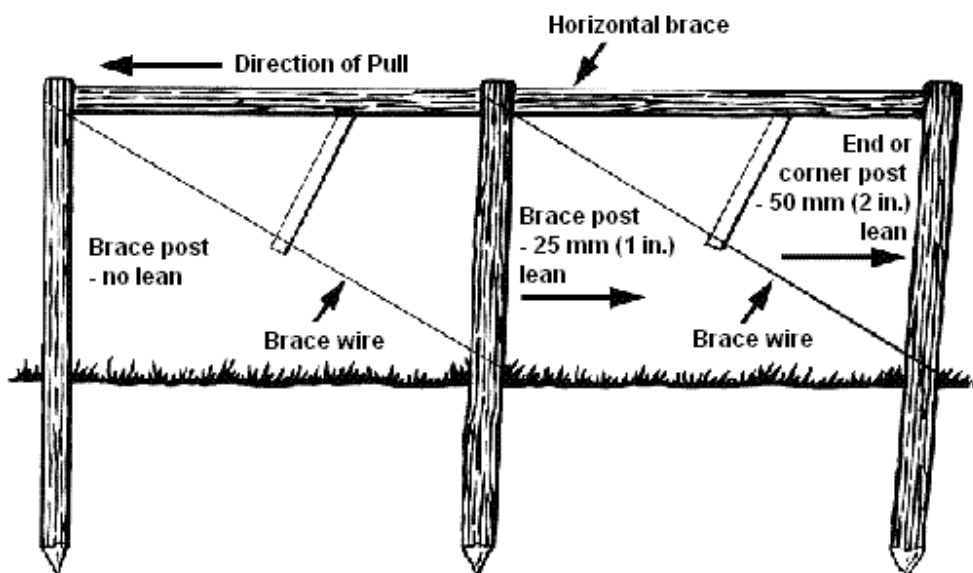


Single-span brace assembly

Credit: OMAFRA <http://www.omafra.gov.on.ca/english/engineer/facts/08-035.htm>

Install an in-line brace assembly along the fence midway between end-brace assemblies but at a maximum interval of 400 m (1,320 ft or 80 rods). An in-line brace assembly can be constructed as a double or single span brace assembly depending on the type of fence. Use only brace posts with no lean for an in-line brace assembly. A corner brace assembly consists of single-span (Figure 2) or double-span (Figure 3)

brace assemblies located at right angles to each other. When the double-span brace assembly is used as a corner or in-line brace (Figure 3), it is stronger than the single-span, if constructed



Double-span brace assembly

Credit: OMAFRA <http://www.omafra.gov.on.ca/english/engineer/facts/08-035.htm>

properly. It would be used as an end brace assembly only if the fence has several wires or if the soils have very poor cohesive properties, such as sandy soil. Designs for brace assemblies may vary depending on contractor preference and/or site conditions.

FENCING COSTS

Fencing Costs for 400 m (1,320 ft) (80 rod) of Various Fencing Types (Fencing costs are average costs for the province. Costs will vary depending upon the location in the province, roughness of the terrain, proximity to bedrock, presence of bush and the actual design of the fencing system, i.e., post spacing, etc.) (Costs as of August, 2015).

Reach Out!

Invite a fencing company owner/salesperson as a guest speaker at your meeting to discuss what types of fencing are used most often in your area for beef cattle and what the costs are.

Material	Page Wire ¹ 9 Strand 12.05 gauge		Barbed Wire ¹ Double Strand 4 wires 1.5 gauge 6 wires (2 electric) ²		Suspension Smooth Wire ³				Electric Permanent ² 12.5 gauge 2 wires	
	# Units	Cost (\$)	# Units	Cost (\$)	# Units	Cost (\$)	# Units	Cost (\$)	# Units	Cost (\$)
Cedar 6-in. posts @ \$13	24	312	24	312	44	572	44	572		
Cedar 5-in. posts @ \$9									44	396
Steel posts @ \$10	55	550	55	550						
Page wire @ \$2.50/m (\$0.75/ft) (\$12.50/rod)	80	1,000								
Barbed wire @ \$0.23/m (\$0.07/ft) (\$93/80 rod) (double strand, 12.5 gauge)			320	372						
Smooth wire @ \$0.13/m (\$0.04 ft) (\$52.77/rod) (12.5-gauge, high- tensile)					480	317	640	422	160	106
Single-span brace assembly	2	170	2	170	2	130	2	130	2	130
Double-span brace assembly	1	145	1	145						
Insulator @ \$0.56 ²					88	50			88	50
Staples @ \$4.40/kg (\$2/ lb)	7	14	7	14	7	14	14	28		
Strainer/Tensiometer					1	40	1	40		
Droppers @\$4 ³					88	352	88	352		
Energizer @\$350					1	350			1	350
Total Cost for Materials/400 m ⁴		2,191		1,563		1,825		1,544		1,032
Labour @ \$30/hr	42	1,260	38	1,140	40	1,200	43	1,290	25	750
Total Cost/400 m ⁴		3,451		2,703		3,025		2,834		1,782
Cost per 0.3 m (1ft)		2.61		2.05		2.29		2.15		1.35

Credit: OMAFRA Farm Fencing Systems Factsheet <http://www.omafra.gov.on.ca/english/engineer/facts/08-035.htm>

Notes for the chart:

¹ Post spacing: 15 m (50 ft or 3 rod) for 150 mm (6 in.) posts and 5 m (16.5 ft or 1 rod) for intermediate steel posts.

² Insulators (2) for electrified suspension smooth wire and electric permanent fences are placed on each post @ 9 m (30 ft) centres.

³ Droppers are spaced midway between posts at 4.5 m (15 ft) centres on suspension smooth wire fencing.

⁴ (1,320 ft) (80 rod).

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

Find out what plants grow in your area that are poisonous to cattle. Make a list of these plants and try to find a picture of these plants online or in a textbook that features range and pasture plants. Be prepared to share your findings at the next meeting.

DIGGING DEEPER FOR SENIOR MEMBERS

Set up a fencing system of your choice for a 50 acre farm. Figure out what and how many supplies you will need to build the fencing system and what the cost of the fencing will be, without and with installation cost.

If you have completed Section 3a, Cattle Facilities and Section 3b, Handling Facilities, figure out what kind of watering and handling systems you would want on your farm and investigate the cost for these systems.

SECTION 2D: ENVIRONMENT & SUSTAINABILITY

SETTING OBJECTIVES:

Cattle producers have been long-time partners with the environment and manage their land to ensure sustainable and viable operations for the long-term. Producers use management practices that protect the health of the animal and the environment by protecting water sources and working towards the maintenance of a sustainable agro-ecosystem. Modern production practices produce more beef from fewer animals which maximizes resources like land and water while providing essential nutrients for the human diet.

Suggested Lesson Outcomes

- To learn about the measures that Canada's cattle industry has taken to minimize the effects of cattle production on the environment
- To understand what sustainable agriculture is
- To realize what environmental footprint beef production has on the environment
- To learn about the impact of beef cattle on nutrient cycles and water use
- To understand the responsibility the cattle industry has as part of a global environmental movement and what the cattle industry has already done to be a part of this

ROLL CALLS

- Name one area that beef production has improved at helping the environment in the last 30 years.
- Name one environmental issue that agriculture has unfairly been accused of contributing to in a big way.
- Give an example of a sustainable agriculture technique which relates to working with beef cattle.

SAMPLE MEETING AGENDA

Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Sustainability and Canada’s Cattle Industry Sustainable Development Sustainable Agriculture Environmental Footprint of Beef Production Impact of Beef Cattle on Nutrient Cycles Impact of Beef Cattle on Water Use and Quality Beef Cattle Production in a Larger Context Environmental Stewardship	40 min + Activities
At Home Activity	Water Testing	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

SUSTAINABILITY AND CANADA'S CATTLE INDUSTRY

Ontario beef farmers are passionate people. They are passionate about caring for their animals, passionate about creating a sustainable environment for future generations and passionate about providing safe and high-quality beef for consumers.

For Canada's 83,000 beef producing families, caring for the land is what they do 365 days a year. Sustaining the land is essential for their business to survive and Canadian beef producers are proud to be stewards of the land around them. Many cattle producers' develop environmental farm plans that help them utilize good management practices reducing the environmental footprint of Canadian agriculture

USING LAND THAT WOULD OTHERWISE BE UNPRODUCTIVE

In Canada, nearly one third of our agricultural land is unsuitable for crops but is suitable for grasses which are used to raise grazing livestock and support wildlife. This more than doubles the land area that can be used to produce food in Canada. Cultivating this land for food crops would destroy natural habitat and impact wildlife. By practicing good grazing management producers maintain biodiversity and wildlife habitat on wild grasslands and prevent erosion on susceptible parts of cultivated land. Planting grasses on vulnerable cultivated land prevents wind and water erosion. Healthy grasslands also encourage biodiversity by providing a natural habitat in which native plants,



Credit: Beef North <http://www.beefnorth.com/>

Check It Out!

Watch the video produced by the Canadian Cattlemen's Association titled 'What is the Environmental Impact of the Canadian Beef Industry?' at: <https://www.youtube.com/watch?v=JDS0ZBmdudg>

insects, birds and wildlife can co-exist and thrive alongside cattle. Pastureland also has the ability to "store" carbon, so it isn't released into the air.

MANAGING THE ENVIRONMENT ALONG RIVERS AND STREAMS

Cattle producers make it a priority to maintain water quality, wildlife habitat and cattle productivity. Cattle are fenced out of the most sensitive areas. Producers take other measures such as fencing "buffer strips" to ensure healthy shoreline vegetation, which in turn filters sediment and provides wildlife habitat. Often solar powered pumps are used to move water into troughs giving cattle clean fresh water and discouraging them from walking into the streams.

Continuing to decrease the carbon footprint

As part of the digestion process, cattle produce the greenhouse gas methane. These emissions from cattle vary with feed quality and digestibility. As the quality of the feed increases, emissions per pound of meat produced decreases. In Canada the quality of feed and pastures exceeds that of most other countries. In fact, Canadian scientists have estimated that GHG emissions/kg live animal weight decreased from 16.4 to 10.4 kg of CO₂ equivalent from 1981 to 2006. Selective breeding has led to cattle that are very efficient in feed conversion and that minimize greenhouse gas emissions. In Canada in 2010, transportation was the source of 28 per cent of total Canadian greenhouse gas emissions, while the total of all Canadian agriculture was responsible for 8% of Canada's greenhouse gas emissions.

Check It Out!

Visit Canada Beef at www.beef.org to check for up-to-date statistics and information about sustainability and Canada's cattle industry.

SUSTAINABLE DEVELOPMENT

One of the problems facing society today is the difficulty of ensuring available natural resources for future generations in the face of our every-increasing population base. Development and industrialization and the huge changes, including population growth, that accompany them, continue to negatively affect our natural environment. In some cases, this has led to the complete depletion of natural resources on which we all depend. The concept of sustainable development – first noted in 1987 by the World Commission on the Environment and Development (the Brundtland Commission) emerged in response to this situation.

Sustainable development means developing our natural resources without over-using them or damaging them. Humans cannot survive without these natural resources and if we do not develop, use and manage them in a sustainable way, we compromise and threaten the survival of future generations.

One aspect of sustainable development is the importance of humans as stewards of the land. Humans who develop and use natural resources and understand the cycles and relationships of these resources are most able to effectively manage and conserve them. Many agriculture producers are already stewards. They have a unique relationship with nature – their livelihood depends on sustaining natural resources. Conserving and properly managing resources is already a way of life for them. They use resources wisely and waste as little as possible.

SUSTAINABLE AGRICULTURE

People in many industries, including agriculture, are thinking about how they will continue to shift towards sustainable development. Sustainable agriculture can be defined as a way to meet food needs now and in the future by taking into account economic, social and environmental factors which affect food production. This will require agriculture producers to continue being good stewards of the land and making appropriate production decisions.

Conserving and managing the environment is an important issue. Agriculture impacts greatly on soil, land and water resources. Individual producers play an important role by using farming methods which conserve and sustain agriculture resources.

The sale of farm land for urban and industrial use is another issue directly affecting society. We need to produce food but we also need space for the continued growth of our communities and industries. Better and more comprehensive land use planning is one solution to this concern.

ENVIRONMENTAL FOOTPRINT OF BEEF PRODUCTION

Grazing cattle are an integral part of the grassland ecosystem and play an important role in nutrient recycling. Pasture lands are important stores of carbon and provide habitat to many species at risk as well as preservation of wetlands that otherwise may be subject to cultivation. Production of cattle in feedlots lowers the carbon footprint of beef and increases the efficiency of beef production. As with any food production system, there is an environmental footprint associated with beef production.

The beef footprint has implications for greenhouse gas emissions, nutrient cycling, water and air quality, carbon stores, and preservation of grassland ecosystems. News related to the beef industry and its impact on the environment in the popular press is often about instances when production has not followed best management practices, however some components of the footprint such as the production of greenhouse gases are unavoidable.

Research shows that our industry has made significant improvements in efficiency over time. A 2015 Beef Science Cluster funded project found that Canada produced 32% more beef in 2011 than in 1981. Much of this was due to higher carcass weights. Producing the same amount of beef in 2011 required 29% less breeding stock, 27% fewer slaughter cattle and 24% less land, and produced 15% less greenhouse than in 1981.

Reductions in the beef industry's environmental footprint have largely come through technologies that improve production efficiencies. Optimizing nutrition has helped to improve growth and reproductive performance. When more females get pregnant and successfully wean a calf, fewer heifers need to be retained as replacements, so the breeding herd is smaller and there are less cows to produce greenhouse gas emissions. On the feedlot side, heifer carcass weight has increased due to growth promotants. Improvements in feed crop yields mean that a smaller land area is needed to produce the same amount of feed.

Many of the same things that improve productivity on the farm, ranch or feedlot also contribute to a smaller environmental footprint for the beef industry.

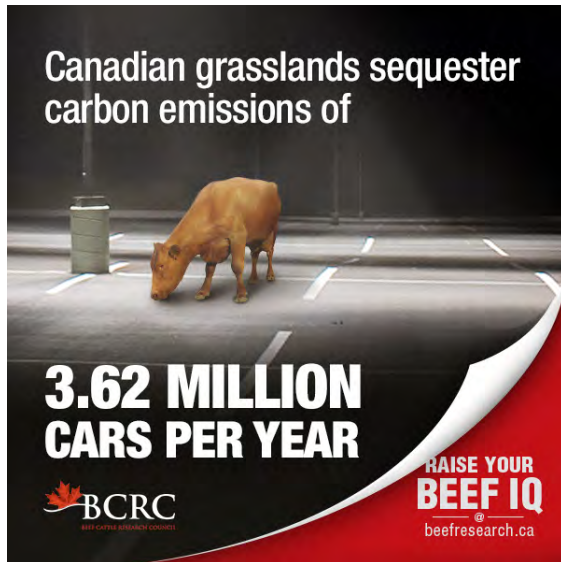
Carbon Sequestration in Seeded and Native Grasslands

Over the last century, the majority of prairie grasslands were plowed for crop production with

Check It Out!

Watch the video titled 'Environmental Footprint of Canadian Beef: A good news story' featuring Dr. Tim McAllister, Agriculture & Agri-Food Canada Researcher speaking to the British Columbia Cattlemen Association at: <https://www.youtube.com/watch?v=1kzueM4Czvk> and/or

Watch the webinar titled 'What is the environmental footprint of beef production?' produced by the Beef Cattle Research Council at: <https://www.youtube.com/watch?v=8XScBqeXTSs>



Credit: http://www.beefresearch.ca/images/BCRC_fact_2.jpg

less than 20% of this ecosystem remaining intact. Native grasslands represent an important storage of carbon and may contain up to 200 tonnes of carbon per hectare. Much of this carbon is stored in the roots of grasses and shrubs, explaining why so much more carbon is released by plowing as compared to that released by natural fire.

Carbon storage can be increased if cropland is planted back to perennial pasture, with sequestration initially occurring rapidly and gradually plateauing over a 20 to 25 year period. In fact, models have shown that if beef cattle are switched from a grain- to perennial forages-based production system, and the forage associated from this transition is derived from newly seeded cropland, the entire beef production cycle becomes a net sink of carbon.

As with most biological systems, grasslands eventually revert to a steady state where if left undisturbed, carbon sequestration is balanced with carbon emissions. Overgrazing or drought can increase carbon losses.

The ability to further sequester additional carbon in properly managed grasslands is questionable, but levels may increase further as atmospheric levels of carbon dioxide continue to



Credit: http://www.beefresearch.ca/images/BCRC_fact_3.jpg

Did You Know?

The amount of carbon stored in a hectare of native grassland is equivalent to the amount of emissions produced by approximately 150 cars over one year.

rise. However, it is clear that any increased sequestration as a result of increases in atmospheric carbon dioxide will not be sufficient to offset ongoing emissions related to the burning of fossil fuels.

Preservation of Grassland Ecosystems

Grazing ruminants are a natural component of grasslands and play a critical role in the recycling of nutrients within these ecosystems.

Grasslands are richly biodiverse and harbour many of Canada's most endangered or threatened species (e.g., burrowing owl, black footed ferret, swift fox, prairie chicken).

Plant communities depend on grazing for removal of aftermath, the distribution of seeds and the provision of open niches that can increase sward biodiversity.

Establishment of perennial forages reduces the disturbance of prairie bird habitats of and, if near surface water, provides nesting sites for ducks and geese. In many instances, land owners control access to these rangelands, preventing the damage that is readily evident in areas where off road recreational vehicles and other activities have degraded grassland habitat.

Cattle and Greenhouse Gas Emissions

In Canada, producing 1kg of beef now creates 15% less greenhouse gases than in 1981, due to improved production practices.

Nearly every living organism, including plants, produces greenhouse gases. Cattle generate more than other livestock because rumen bacteria produce methane as they digest feed. Additional greenhouse gases come from manure (methane and nitrous oxide) and fossil fuel use on farm (carbon dioxide).

In 2006, the United Nation's Food and Agriculture Organization (FAO) released a report called "Livestock's Long Shadow" which greatly misrepresented the amount of emissions produced in raising beef cattle. A more balanced FAO report named "Tackling Climate Change Through Livestock" came out in 2013. This less publicized report found that producing a kilogram of beef in Latin America, India or China generates twice the methane as in North America, Europe or Australia.

A 2015 Beef Science Cluster funded project looked at the change in the Canadian beef industry environmental footprint between 1981 and 2011. Researchers reviewed many different Canadian research projects that studied how slight changes in reproductive rate, feed and forage crop yields, growth rates, carcass weights, etc. impact how much feed and land is needed to produce a kilogram of beef, and how much manure and greenhouse gases are produced as a consequence.

The results showed that producing the same amount of beef in 2011 produced 15% less greenhouse gases than in 1981. Over 78% of the methane emissions occurred in the cow-calf sector, because the breeding herd spends nearly its whole life consuming forage-based diets that produce more methane than grain-based diets do.

Reductions in the beef industry's environmental footprint have largely come through technologies that improve production efficiencies.



Credit: http://www.beefresearch.ca/blog/wp-content/uploads/2016/01/BCRC_fact_6_reducedGHGemissions.jpg

Cattle production contributes to the emission of three greenhouse gases (GHG);

- carbon dioxide
- methane
- nitrous oxide

Carbon Dioxide

Carbon dioxide accounts for a small portion of emissions (5%) from Canadian beef production and arises primarily from the burning of fossil fuels. In the beef industry, the use of fossil fuels is primarily associated with crop production (fertilizer and fuel) and the transport of feed, cattle and beef to markets. Because beef is produced outdoors, emissions associated with the heating of production facilities are miniscule. Grasslands on which cattle graze contribute to carbon sequestration, or the capture of carbon dioxide

Methane

Methane is produced by methanogens under anaerobic conditions (without oxygen) in both the animal and manure. However, as beef manure is typically applied to the land fresh, the anaerobic conditions necessary for methane production are impaired. Therefore, beef manure only accounts for approximately 5% of emissions.

The largest source of GHG in beef production comes from the methane produced in the gastrointestinal tract, accounting for over 60% of total emissions.

Methane is a natural by-product of feed digestion in the intestinal tract and is produced by the reduction of carbon dioxide via the addition of hydrogen. If methane production is inhibited without an alternative hydrogen disposal, efficiency of beef production can be impaired. Identifying technologies that lower methane production without adverse impacts on efficiency has proven to be a significant challenge for the scientific community. However, enteric methane emissions can be reduced by the addition of certain feeds, including grain or oils, to the diet.

Nitrous Oxide

Nitrous oxide has a much higher global warming potential than either methane or carbon dioxide. Nitrous oxide emissions arise from manure and cropland and account for approximately 25% of total GHG emissions from Canadian beef production.

Emissions of nitrous oxide are increased if the level of protein in the diet exceeds the animal's nutritional requirements or if the amount of nitrogen applied to land exceeds what is required for the crop. Balancing of the diet to meet protein requirements and soil tests to ensure that manure application does not exceed crop nitrogen requirements, are two of the most effective methods of reducing nitrous oxide emissions from beef production systems.

Did You Know?

A global research effort has identified technologies that can reduce methane emissions from cattle. Increasing the value of carbon would increase the use of these technologies in beef production.

Impact of Beef Cattle on Air Quality

A common environmental footprint concern raised during beef production is the negative impact that intensive feedlot operations have on air quality through the generation of dust and odors. Issues often arise from acreages or towns that reside downwind of feedlots.

Dust can arise from pen surfaces, alleys and roads and is influenced by humidity, temperature and wind speed. Secondary emissions in the form of ammonia and odoriferous organic compounds such as amines, sulfides, phenols and volatile fatty acids may also occur. Depending on the compound, they can be transported several kilometers from the feedlot.

Long term health consequences associated with exposure to particulate matter from feedlots are largely unknown, but its impact on individuals suffering from chronic respiratory disease can be severe.

Deposition of ammonia and organics may adversely impact water quality. Ammonia can also contribute to indirect nitrous oxide emissions.

Mitigation

As with nitrous oxide, ammonia emissions from feedlots can be reduced by balancing diets so as not to exceed protein requirements of the animal. Urease inhibitors which inhibit the hydrolysis of urea in urine may also reduce ammonia volatilization, but are expensive and may only delay rather than reduce total ammonia emissions.

Provision of fresh bedding in pens, frequent cleaning of pens, planting of shelter belts and the construction of wind breaks may all reduce the movement of dust and odors associated with the feedlot. Proper drainage of pens can also prevent the development of the anaerobic conditions that promote such odors. Under arid conditions, sprinklers and water trucks can be used to reduce dust emissions from pen floors, alleys and roads. Many of these practices have the added benefit of improving animal health and housing conditions.

Proper manure management practices can also reduce nuisance odors by incorporating manure immediately after land application. This may also help conserve nutrients for crop growth and increase the organic matter content of soil.

Did You Know?

Balanced feedlot diets that do not exceed an animals' protein requirements reduce nitrous oxide and ammonia emissions.

IMPACT OF BEEF CATTLE ON NUTRIENT CYCLES

On grassland

Nutrients are largely cycled within grassland ecosystems without reaching high concentrations or leaving the system. Nutrients in feces and urine are dispersed as cattle move throughout the pasture seeking new forage stands to graze. Fecal pats provide nutrients to insect communities such as dung beetles and the readily available nitrogen in urine is quickly utilized by plants.



Credit: https://vmcdn.ca/f/files/nob/uploadedImages/Regional-News/timmins/2017/05-may/cattle_cropped.jpg;w=630

For optimal production, cattle require an array of nutrients including protein, carbohydrates, fats, vitamins and minerals. Under grazing conditions, most of these nutrients are acquired directly from forages and cattle require minimal supplementation with trace minerals and salt.

In feedlots

In intensive feedlot systems, feed is transported to the cattle and placed in feed bunks once or twice daily. Diets have a greater energy density as a result of the inclusion of grains increasing the efficiency of beef production.

However, in this system some dietary nutrients such as phosphorus exceed requirements, even though diets are not supplemented with this mineral. Because the only component that leaves this system is the cattle when they are shipped to market, other nutrients also accumulate.



Credit: https://static.agcanada.com/wp-content/uploads/sites/3/2016/02/ration-costs_cattle_CanadaB.jpg

Most nutrients are in the manure with the exception of the gaseous emissions described above. Manure is a valuable source of fertilizer and is applied to surrounding farmland, reducing the reliance on chemical fertilizers and increasing the organic matter content of soils. However, due to its high water content, manure is economical as fertilizer only if it is transported within a radius of 20 - 30 km of the feedlot. Furthermore, manure is usually applied to cropland based on the nitrogen requirements of the crop. This leads to excess application of other nutrients such as phosphorus and potassium, which accumulate in the soil.

To date, there is little evidence that the accumulation of nutrients in cropland adversely impacts the surrounding environment or crop production. This is likely due to the fact that much of the

phosphorus is in an insoluble form. In regions where livestock production systems are more intensive than in Canada, such as Denmark and the Netherlands, the long term impacts of using livestock manure as fertilizer has become an important issue.

Areas adjacent to intensive feedlot operations need to implement rotational cropping systems or increase manure transport distances to slow the rate of nutrient accumulation in soils.

IMPACT OF BEEF CATTLE ON WATER USE AND QUALITY

Canada's beef industry has dramatically reduced its water footprint over the past several decades, and that trend is expected to continue, a study published in 2017 found. The amount of water required to produce one kilogram of Canadian beef decreased by 17% from 1981 to 2011, due largely to enhanced efficiency in how feed crops for beef cattle are produced, as well as enhanced efficiency in raising beef cattle and producing more beef per animal.

Specifically, the study found that the blue water (surface and groundwater) footprint of Canadian beef in 1981 was 577 L/kg boneless weight at slaughter and in 2011 it was 459 L/kg live boneless weight at slaughter. That's a 20 percent decline over the 30-year period.

When green water (rain water) was added to the equation, the study found that the overall water footprint of Canadian beef in 1981 was 9,625 L/kg live weight at slaughter and in 2011 was 7,989 L/kg live weight at slaughter (respectively 19,301 L/kg and 15,944 boneless weight). The key focus is water intensity – over the 30-year period the amount of beef produced per unit of water is a lot more and therefore water is being used much more efficiently.

The majority of water used in beef production is for crop production. The large variation in previous estimates reflect differences in the assumptions in water use prediction models, such as the inclusion of natural rain fall, wastage during irrigation, and the degree to which recycling of water is considered (e.g., irrigation from catch basins).

Water plays a critical role in beef cattle production. Many of Canada's largest feedlots depend on irrigation water during arid periods. The impact of climate change on water availability in these areas remains unknown, but many models predict an increase in rainfall in the prairie regions where the majority of beef cattle production occurs.

It's important to note that water is a resource that cycles. The water that is used in beef production does not disappear; eventually the water will cycle back through the system to be used again. Also, beef production activities support a healthy and functional water cycle. For example, through raising cattle on healthy pasture, we can ensure that the ecosystem maintains its important water filtration function.

Cattle can also contribute to the conservation of wetlands as these surface waters are not drained as they are for cropping systems. Many of these areas serve as important habitat for

Judge It!

Have samples of soil from four different fields for members to judge. Discuss what characteristics are desirable in soil for plant growth and then have members rank the soils based on these characteristics and give reasons for their choices.

aquatic birds and mammals.

Pathogens

Beef cattle can carry protozoa (e.g., Giardia, Cryptosporidium) and bacteria (e.g. Escherichia coli O157, Campylobacter) that cause disease in humans. Water can serve as a vector for these microbes and steps are commonly taken to reduce the risk of manure coming in direct contact with surface water.

Modern feedlots are designed with sloped pens and ditches that drain into catch basins with a capacity to hold the precipitation from an extremely intense 24-hour storm. This prevents water from the feedlot directly entering surface streams and creeks. Numbers of pathogens in this water decreases with time and water from catch basins is used in feed crop production. Use of this water to irrigate vegetable crops that are not cooked prior to consumption should be avoided.

Sensitive riparian areas along streams and rivers are often fenced or lined with buffer strips to reduce the access of cattle to surface water whereas the access of cattle to irrigation canals is restricted. Completely limiting the access of cattle to surface water on grazing lands is impractical and cattle can defecate while drinking and crossing streams. Likewise, wild ruminants (deer, moose) aquatic mammals (beavers, musk rats) and birds (geese, ducks) which can also carry human pathogens, occupy this ecosystem and defecate in the surrounding water. Consequently, when a pathogen does cause disease, its true point of origin is often difficult to determine. The majority of the risk associated with acquiring pathogens can be eliminated by filtering or treating surface water prior to consumption.

BEEF CATTLE PRODUCTION IN A LARGER CONTEXT

Indirectly, the environmental footprint of beef is a reflection of mankind's demand for high quality protein in their diet. In North America, grains represent a significant proportion of the diets of feedlot cattle and contribute to the efficiency of this production system. Even in this case, grains are often initially grown for more value-added markets (e.g., brewing, distilleries, flour), and only end up as feed after they fail to make the grade for human consumption.

By 2050, as the human population reaches 9 billion and the average household income continues to rise, meat consumption is predicted to double. Consequently, it is important that environmental footprints are assessed from the standpoint of the efficiencies of meat production or expressed on impact per kg of meat produced.

Livestock production systems are complex and improvements in an area of production can lead to deficiencies or degradation in other areas. Presently, the economic conditions are favourable for the production of beef from grain in many regions of the world, largely because of the availability of inexpensive fossil fuels. As the price of fossil fuels increase, beef production may

Did You Know?

Not all microbes shed by beef cattle cause disease in humans. Some strains are adept at persisting in cattle but not in humans.

Experience It!

Visit a feedlot to see how they manage water use and manure management.

Did You Know?

Global meat consumption is predicted to double by the year 2050

revert entirely to relying on what ruminants do best – the conversion of forages into high quality protein.

It is important to keep in mind that as one drives through the country side and sees the fields of hay and hills of native pasture, that ruminants are the only livestock that can effectively convert this biomass into high quality protein for human consumption.

ENVIRONMENTAL STEWARDSHIP

Cattle producers utilize many grazing management techniques, participate in training and follow expert studies/research to enhance land use, conservation and management of resources. Other tools may include cross-fencing, intensive rotational grazing, pasture or rangeland assessment, and fragile lands left in natural grassland or re-seeded to tame grass and forages. In addition, many beef cattle operations and feed yards have completed an Environmental Farm Plan to manage potential risk and undertake many practices beneficial to their local ecosystem, in addition to meeting provincial regulations on confined feeding operations.

The Verified Beef Production Plus (VBP+) program may assist your self-evaluation on important aspects. To contact a provincial VBP+ coordinator in your region, visit <http://verifiedbeefproductionplus.ca/contact-us.cfm>

Excerpts, statistics and graphics courtesy of the Canadian Beef Research Council www.beefresearch.ca

Check It Out!

Visit Journey 2050 at: www.journey2050.com Journey 2050 is a free, curriculum-based school program that takes participants on a virtual simulation which explores world food sustainability.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

Find out where you would get water tested in your area, see if there is a cost and find out what you need to do to get your water tested. If your water hasn't been tested recently, and after getting permission, get your water tested and look at the results to find out what it is tested for and what the levels are in your water.

DIGGING DEEPER

FOR SENIOR MEMBERS

The Canadian cattle industry has done a lot in past years to manage their land to ensure their farms will be viable for generations to come. Is there an area that beef producers could improve even further to help the environment? What new technologies are being developed to help reduce emissions even further and to help create even less impact on the land? Create a presentation about what beef producers currently do to create sustainable farms and what possibilities there are in the future. This could be presented at a 4-H Awards Night, a presentation at school or at a community event.

FEEDING THE HERD



UNIT 3A – DIGESTIVE SYSTEM

SETTING OBJECTIVES:

In order to understand nutrition in beef cattle, it is first essential to understand the digestive system and the many parts that make it function properly and efficiently.

Suggested Lesson Outcomes

- To understand the difference between ruminants and monogastrics
- To be able to identify the parts of the digestive system
- To understand the difference between the digestive system of a mature beef animal and a beef calf

ROLL CALLS

- Name one part of a ruminant’s digestive system.
- Name an animal. Is it a ruminant or a monogastric?
- Why is it important to understand an animal’s digestive system?

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Ruminants vs. Monogastrics Digestion & The Digestive Tract The Calf’s Digestion Activity #1 Mature Beef Animal’s Digestive Tract Activity #2 A Stomach At Work Activity #3 Veterinary Exploration	30 min + Activities
At Home Activity	Diet Comparison	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

RUMINANTS VERSUS MONOGASTRICS

Cattle are called ruminants, meaning that they have a digestive system which includes one stomach with multiple stomach compartments. Each of these stomach compartments has their own special job to help the animal efficiently digest its fibrous diet.

Humans and animals such as pigs and horses are monogastrics - meaning that they have one stomach that has one compartment. Cattle and humans have different types of digestive systems because they eat very different things. To remember which stomach-type is which, just think of it this way, “mono” means one and “gastric” means stomach.

DIGESTION

Digestion is the preparation of food for absorption

Before the body can use nutrients from foods, the stomach must digest them so the body can absorb them. The digestive system does this by breaking the food down into tiny bits and then breaking them down even further so they can be absorbed into the body parts.

THE DIGESTIVE TRACT

The **mouth** takes the food into the body. The food is broken up into smaller bits by the chewing and grinding of the teeth. Saliva from the mouth helps to break the food down more. The saliva contains enzymes which attack the food.

The **esophagus** is the long tube or tunnel which runs from the mouth down to the stomach. When food is swallowed, it goes down the esophagus into the stomach. The **stomach** of the beef animal has 4 distinct compartments. This is how we know that he or she is a ruminant animal. Each of these compartments has its own special job to do in digesting food.

The first part of the stomach the food enters is the **rumen**. This is the largest compartment. In the adult beef animal, it takes up about 80% of the size of the entire stomach. The rumen mixes the food. Microbes or “bugs” attack the food and help break it down.

From the rumen, the food moves to the **reticulum**. The fine material is moved to the next compartment. The coarser food material is sent back up to the mouth for more chewing. This is called RUMINATION, or, “chewing the cud”.

The third compartment of the stomach is the **omasum**. The omasum squeezes the fluids out of the food material.

The fourth and last compartment of the stomach is the **abomasum**. It is also called the true stomach since it is very similar to the stomach of the human and other monogastric animals. The abomasum contains digestive juices which help to break down the food even more. In the newborn calf, the milk bypasses the first three stomach compartments and goes directly down the esophagus into the abomasum.

Look It Up!

What enzymes are contained in the saliva of beef cattle?

Check It Out!

The cow spends up to 8 hours a day “chewing its cud”. This is 1/3 of its life! What does chewing its cud mean?

When the food moves out of the stomach, it no longer looks like the food which your animal ate. This food material goes from the stomach into the **small intestine** which is like a very long, thin, coiled tube. Juices are found here. These juices help to change the food material to a form which the body can absorb.

Now, the material moves to the **large intestine**. The large intestine is a shorter, fatter tube. It absorbs what is left of the liquid in the material and adds mucus to help the material travel more easily.

The final part of the digestive system is the **anus**. This is the opening in the body through which the waste material passes. This waste material is the remains or undigested food, which we refer to as manure.

Judge It! (if you dare!)

Look at four samples of cattle manure. Get samples from four animals eating a similar diet. Judge the samples based on how well the animal's digestive system processed the feed the animals ate.

Development of the Ruminant Stomach

The ruminant stomach is very unique in the way in which it develops. There are several special features the ruminant has which enable it to digest roughages and other materials.

The mature ruminant stomach has 4 compartments, each with a specific function.

RUMEN or “paunch”

- largest stomach compartment in the mature ruminant animal;
- bacteria and microbes found here begin to break down the food, attacking the fibre in the roughages; and
- separated from the reticulum by the rumenoreticular fold.

RETICULUM or “honeycomb”

- lined with many honeycomb-like compartments
- liquid and finer material is moved to the next compartment
- coarser material is returned to the mouth for more chewing
- any foreign objects the animal takes in will lodge here
- this is where a magnet rests

OMASUM or “manyplies”

- often referred to as the “bible” because of its many leaves the contractions squeeze out more fluid, grind, and move the contents to the abomasum

ABOMASUM or “true stomach”

- most similar to the simple stomach found in other animals
- digestive juices are secreted here —
- they break down the food material further, getting it ready for nutrients to be absorbed into the blood stream.

Ruminating or Chewing Cud

When a mature beef animal first ingests their food, they don't really chew that much before swallowing it. They will regurgitate the food later for a more thorough chewing. The ball of food they regurgitate is called “cud”. Ruminants are known for chewing their cud and a word for “chewing cud” is ruminating! That's where ruminants get their name.

Eructation or Belching

As part of their digestion, cows belch. When their cud is regurgitated, the fermentation-gas produced in the rumen is also forced up and out through the esophagus resulting in a belch or “eructation” necessary for eliminating the gas produced. If they didn't eructate then they'd end up bloating.

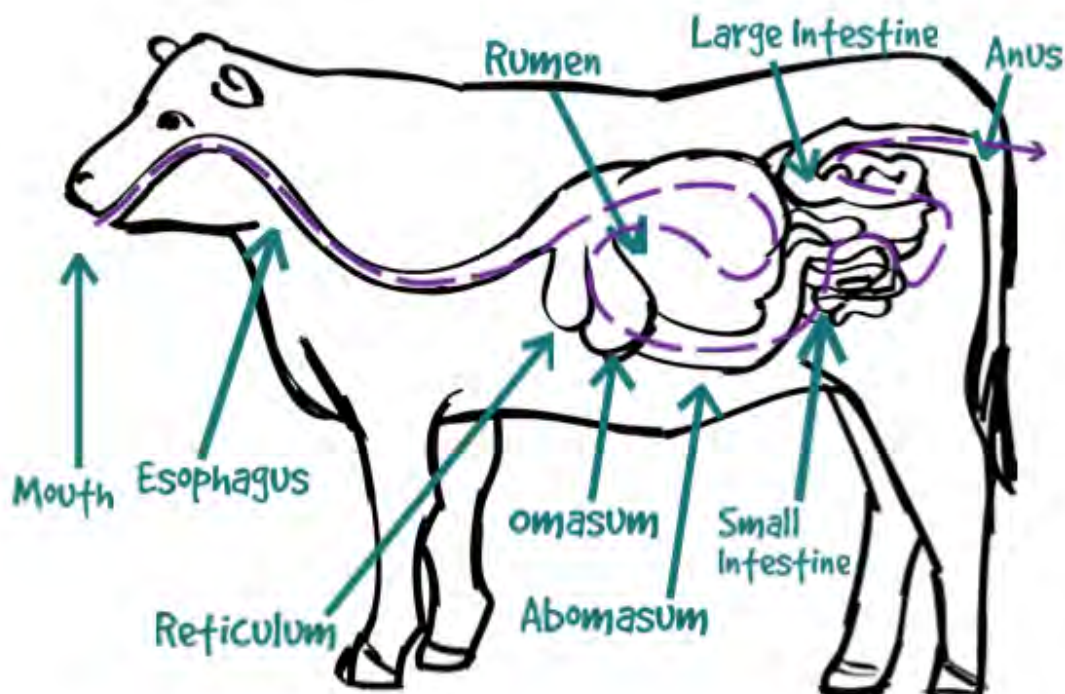


Diagram Credit: 4-H Alberta

THE CALF'S DIGESTION

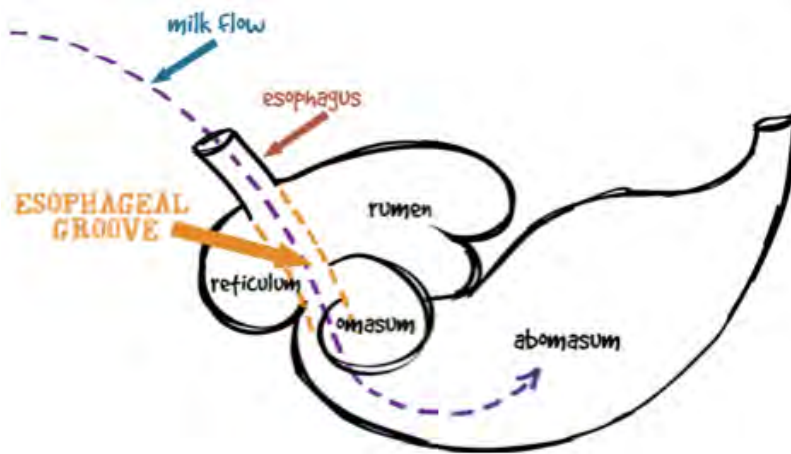


Diagram Credit: 4-H Alberta

The Stomach of a Newborn Calf

In the newborn calf, the rumen is smaller in comparison to the other stomach compartments.

The **oesophageal groove** is a unique feature in the stomach of the newborn ruminant.

What is it?

The oesophageal groove is a tunnel created in the digestive system which allows milk to bypass the rumen.

How does it work?

When the calf sucks, reflex causes the heavy muscular folds of the rumen and the reticulum to meet. This creates the tunnel.

What is its purpose?

This tunnel leads from the oesophagus to the abomasum. Liquids which the calf takes in will bypass the rumen and go directly into the abomasum.

How can you make sure it works?

Don't try to feed the newborn from a pail. If your calf is not nursing, make sure the calf suckles from a nipple pail or bottle. It is the suckling action and the sensitivity of the nerves to the milk which create the oesophageal groove. If the oesophageal groove is not closing properly, the milk will enter the rumen. Bacteria in the rumen will begin to ferment the milk. This will cause the production of gas. Because the belching mechanism is not yet working in the calf, the calf cannot expel the gas properly. Calves with this problem will become paunchy or "pot-bellied".

At birth, the rumen and reticulum have only a few microbes, so the calf cannot yet digest

Review It!

Learn the parts of the digestive system in the beef animal to know the route that food travels through the body:

- Mouth
- Esophagus
- Stomach
- Rumen (also sometimes referred to as paunch)
- Reticulum (also sometimes referred to as honeycomb)
- Omasum (also sometimes referred to as manyplies)
- Abomasum (also sometimes referred to as true stomach)
- Small Intestine
- Large Intestine
- Anus

solid foods. Shortly after birth, once the calf begins to nurse and explore its environment, the microbes will multiply.

You should begin to provide some solid food at a few weeks of age. This will help the development of the rumen microbes. Since the oesophageal groove closes only with suckling and liquid feeding, the solid food will go directly into the rumen. Once you have started feeding solid food, you can speed up the development of the stomach by increasing the amount of solids fed.

Between birth and maturity, the rumen and reticulum increase ten times in size in relation to the abomasum.

Compartment Size as a Percentage of the Size of the Stomach

	At Birth	At Maturity
Rumen	25%	80%
Reticulum	25%	6%
Omasum	10%	3%
Abomasum	40%	11%

Credit: B.C. 4-H Beef Member Manual

Check It Out!

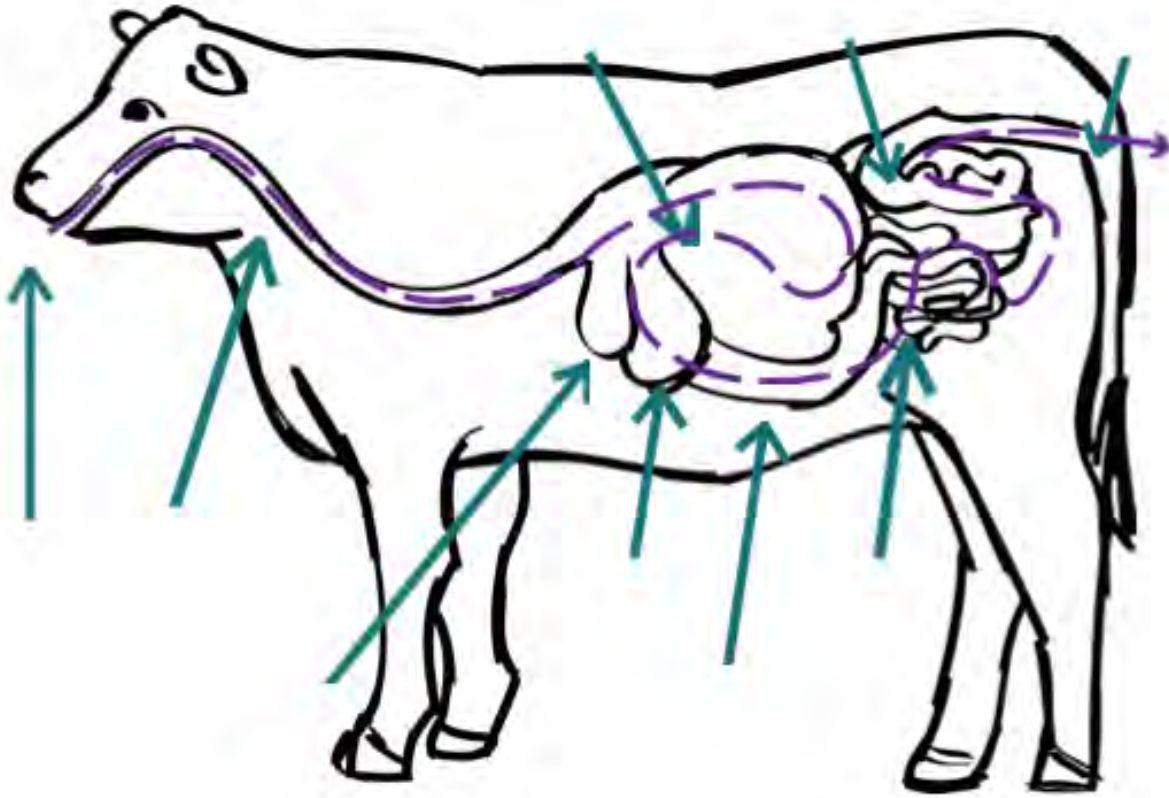
Watch Beef TV courtesy of 4-H Alberta. Learn about beef animal digestion through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

ACTIVITY #1
MATURE BEEF ANIMAL'S DIGESTIVE TRACT

<p>DO</p>	<p>Time: 20 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> - Mature Beef Animal's Digestive Tract worksheet - Writing utensil <p>Instructions:</p> <ul style="list-style-type: none"> - Give each member a Digestive Tract worksheet - Explain the worksheet and have members fill in the blanks to identify the parts of the digestive tract - Review the worksheet and discuss what each part of the digestive tract does
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To allow members to identify and understand the various parts of a mature beef animal's digestive tract. This will allow members to better understand beef nutrition as they progress in their knowledge of beef cattle.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Why is it important to know and understand the parts of the digestive system? - Was it easy or hard to fill out the worksheet? - How does the diagram in the activity differ from the digestive system of a beef calf?

ACTIVITY #1 WORKSHEET
MATURE BEEF ANIMAL'S DIGESTIVE TRACT

Correctly identify the animal's digestive tract.



- | | | | |
|-----------------|-------|-----------|-----------------|
| Rumen | Mouth | Reticulum | Small Intestine |
| Large Intestine | Anus | Omasum | Abomasum |
| Esophagus | | | |

Credit: 4-H Alberta

**ACTIVITY #2
A STOMACH AT WORK**

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> - Bread - Re-sealable plastic sandwich bag - Cola - Hay (ground corn can also be used) - Paper towels <p>Instructions:</p> <ul style="list-style-type: none"> - Place half a slice of bread in a re-sealable plastic sandwich bag. The bag acts like a stomach - a muscle that contains and squeezes the food. - Fill the bag with 75mL (1/3 cup) of cola. The liquid acts like the digestive juices in the stomach. The digestive juices are stomach acid and enzymes that react chemically with the food in the stomach. Observe what starts to happen to the bread. - Ensure that the plastic bag is tightly sealed. Wrap a piece of paper towel around the bag (the model stomach). - Gently squeeze the paper towel covered plastic bag for two minutes. This will act as the muscles for the model stomachs. Be sure to keep the paper towel wrapped around the bag and be gentle when squeezing the bag. - Remove the paper towel and, without opening the bag, observe what has happened to the contents. - Repeat this activity using hay or grain instead of bread. Observe the difference in how the 'food' broke down in the bag.
REFLECT	<p>Learning Outcomes:</p> <p>To allow members to witness and experience first-hand what the digestive process looks like in the stomach.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Think about how your own pets and/or livestock digest their food. Are they monogastric or ruminant animals? - Was it easy or hard to get the hay to start to break down? - Does the type of feed make a difference for the length of time required for food to start to break down?

**ACTIVITY #3
VETERINARY EXPLORATION**

<p>DO</p>	<p>Time: 60 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> – Veterinarian to supervise the activity – A deceased beef animal to dissect – Dissection tools <p>Instructions:</p> <ul style="list-style-type: none"> – Under the supervision of a veterinarian, look at the digestive system of a recently deceased beef animal. – Identify the parts of the digestive tract
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To allow members to identify and understand, in a hands-on activity, the various parts of a mature beef animal’s digestive tract. This will allow members to better understand beef nutrition as they progress in their knowledge of beef cattle.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> – Why is it important to know and understand the parts of the digestive system? – Was it easy or hard to fill out the worksheet? – How does the diagram in the activity differ from the digestive system of a beef calf?

AT HOME ACTIVITY

Look at your diet and the diet of a mature beef animal. How does your diet differ from that of a beef animal? Make a list of foods that you can eat but cattle do not. Then make a list of foods that cattle eat that you would not/should not eat. Are there any foods that are good for both humans and animals to eat?

DIGGING DEEPER FOR SENIOR MEMBERS

What is a twisted stomach in a bovine animal? What has gone wrong with the digestive system and what steps need to be taken to correct this? Research either by interviewing a veterinarian or by reading reputable veterinary books or online material to find answers.

UNIT 3B – NUTRIENT REQUIREMENTS FOR BEEF CATTLE

SETTING OBJECTIVES:

The nutrients found in food are what nourish the body. An imbalance of nutrients causes deficiencies. In the beef industry, this not only causes hardship for animals but is also an economic loss to the beef farmer as production levels will be poor.

Suggested Lesson Outcomes

- To appreciate what a nutrient is and what it is needed for
- To be able to identify symptoms in animals when there are nutrient deficiencies
- To understand the importance of energy in the diet and why it is calculated

ROLL CALLS

- Name a nutrient.
- Name a feed item and at least one nutrient it has in it.
- What is a nutrient?

SAMPLE MEETING AGENDA Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information What is a Nutrient? Nutrient Deficiencies Where Nutrients are Found Understanding Energy Activity #1 Injectable Vitamins and Minerals	40 min + Activities
At Home Activity	Vitamin/Mineral Supplement Tags	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

WHAT IS A NUTRIENT?

A nutrient is something needed for life.

What is a nutrient needed for?

- Maintenance
- Growth
- Production
- Reproduction

A nutrient is like an ingredient in a recipe. If an ingredient is left out, the food being prepared will not turn out properly. If an ingredient is left out of a beef animal's diet, he or she will not grow up or produce as well as expected. A properly balanced diet is just as important for cattle as it is for humans. It is necessary that the animal's daily nutrient requirements are being met through their diet – better known as a ration.

A nutrient is a substance that provides the nourishment needed for life. If an animal does not receive enough of a nutrient, it is said to be deficient.

There are 5 nutrients the beef animal needs in its diet:

- Water (covered in the Importance of Water section)
- Protein
- Energy
- Vitamins
- Minerals

Communicate It!

Have you ever made a recipe and forgot an ingredient from the recipe? How did the food turn out?

Protein

Protein is needed by the beef animal for:

- Growth
- Reproduction
- Muscle development and action
- Hair growth
- Milk production.

Most feeds contain some protein. However, it is often in only small amounts. The best sources of protein are:

- Soybean meal
- Canola meal

Energy

What is energy?

Energy is the power the animal needs for the body to function. It receives this power from the food it digests, or the “fuel” it “burns”. The beef animal needs energy for many reasons:

- to keep warm
- to grow
- to produce milk and calves
- to move around

It receives energy from digesting carbohydrates and fats. Carbohydrates include the sugar, starch and cellulose found in plants. Grains such as corn, barley and oats as well as the oils of soybean and canola are good sources of energy.

Too Much Energy - How can you tell if your beef animal is getting enough energy?

- becomes too fat
- calving is difficult
- upset digestive system
- lower resistance to disease

Too Little Energy - How can you tell if your beef animal is not getting enough energy?

- slow or stopped growth
- losing weight
- poor hair coat
- lower resistance to disease
- reproductive problems

The lists above show how important it is to provide your beef animal with the right amount of energy.

Vitamins

Vitamins are needed for the following activities:

- Growth
- Reproduction
- Movement
- To stay healthy

There are many vitamins. Each of them is important for specific reasons.

Vitamin	Source	Importance
A	Added to diet Green Forages	<ul style="list-style-type: none"> - Most important vitamin for cattle - Needed for vision, healthy skin and tissue, bone development, reproduction - Content in feed declines as feed ages - Forages contain carotenes which the body uses to make vitamin A - Stored in the body up to six months – fat soluble
B	Made in the rumen	<ul style="list-style-type: none"> - There are many B vitamins (riboflavin, thiamine, niacin, etc.) - Not stored in the body – water soluble
C	Made in the body	<ul style="list-style-type: none"> - Not stored in the body – water soluble - Humans cannot make their own so they must receive it in their diet
D	Sunshine Sun-cured forages	<ul style="list-style-type: none"> - Need for strong bones and growth - Animals kept indoors and fed silage may need to receive supplement Vitamin D - Stored in the body – fat soluble
E	Green forages Whole grains	<ul style="list-style-type: none"> - Works together with selenium in muscle action - Stored in the body – fat soluble
K	Green forages Made in rumen	<ul style="list-style-type: none"> - Needed for blood clotting - Mouldy sweet clover restricts K action - Stored in the body – fat soluble

Credit: British Columbia 4-H Beef Member Manual

When the diet is deficient in vitamins, several problems may occur.

Vitamin	Vitamin Deficiency Symptoms
A	Night blindness, weakness, reproductive failure, reduced growth, increased susceptibility to disease
B	Rickets, weakness, symptoms similar to calcium phosphorus deficiency
E	Nutritional muscular dystrophy, staggering gait, symptoms similar to selenium deficiency
K	Hemorrhaging, reduced blood clotting time, weakness, anemia
Thiamine	Reduced growth, diarrhea
Riboflavin	Leg paralysis, neural degeneration, reduced growth, diarrhea
Niacin	Lesions on the tongue, lips and mouth, dermatitis, reduced growth
Pyridoxine	Staggering gait, convulsions, reduced growth

Credit: British Columbia 4-H Beef Member Manual

Minerals

Minerals are needed in the body to build healthy teeth and bones. They are also needed for other functions including the working of muscles and nerves. There are at least 19 minerals required by the beef animal. Some of these are:

Share It!

Have you ever witnessed an animal that was suspected of being deficient in a certain vitamin? What symptoms did it have?

Macrominerals

Minerals required in fairly large amounts:

- Calcium
- Phosphorus
- Magnesium
- Potassium
- Sodium
- Chlorine
- Sulphur

Microminerals

Minerals required in smaller amounts:

- Iodine
- Cobalt
- Selenium
- Iron
- Zinc
- Copper
- Molybdenum
- Manganese

Some Symptoms of Mineral Deficiencies

Mineral	Deficiency Symptoms
Calcium	- poor growth
	- bowed leg bones
	- brittle bones
	- poor growth
Phosphorous	- craving for wood, hair, soil
	- poor conception rates
Magnesium	- muscle tremours
	- staggering, convulsions (grass tetany)
	- poor growth
Sodium (salt)	- chewing or licking of wood
	- weakness, inability to stand
Selenium	- weakness, inability to stand

Credit: Ontario Ministry of Agriculture, Food & Rural Affairs Factsheet – Basic Beef Cattle Nutrition

ABOUT SALT

Type of Salt	Minerals Contained
White	Sodium, Chloride
Iodized (red)	Sodium, Chloride, Iodine
Cobalt Iodized (blue)	Sodium, Chloride, Iodine, Cobalt
Trace Mineralized	Sodium, Chloride, Iodine, Cobalt, Zinc, Iron, Manganese, Copper, Selenium

Credit: British Columbia 4-H Beef Member Manual

WHERE NUTRIENTS ARE FOUND

Cattle are able to make use of a wide variety of feeds derived from plant materials. Most of these feeds belong to one of the following categories and share similarities within the group. These are:

Forages

- hay, haylage, corn silage, grass
- forages are high in fibre and low to medium energy
- their protein content varies greatly depending on the plant, the maturity of the plant at

Research and Talk About It!

White Muscle Disease is a deficiency of vitamin E and selenium. What other diseases can be attributed mineral deficiencies?

Do It!

Look at a label from a bag of salt. What does it tell you? Make a list of what you learned from the label.

harvest time and the quality of the preservation at harvest

- usually the most economical source of feed and usually grown on-farm

Grains (Concentrates)

- corn, barley, oats, wheat
- usually high in energy but low in fibre
- moderate protein content
- often grown on-farm

Protein Supplements

- high-protein oil seeds such as soybeans, soybean meal, canola meal
- high in protein, usually high in energy
- added to rations as a source of additional protein
- usually purchased

Byproduct Feeds

- distiller's grains, sweet corn cannery waste, potatoes, apple pomace, brewer's grains, bakery waste, grain screenings
- these can be variable in their nutrient content
- sometimes a very economical source of nutrients if a good source can be found
- may contain high levels of moisture
- supply maybe erratic, unreliable or seasonal

FUNCTION AND OTHER FACTORS AFFECTING CATTLE'S NUTRIENT REQUIREMENTS

Feeding a balanced ration is important in that it ensures that your cattle are getting the right amount of nutrients in the correct proportion.

The nutrient requirements of an animal depends on it's function or type. A nutrient requirement is the amount of a specific nutrient that is required to meet an animal's minimum need in order to function properly (maintain, grow, produce or reproduce). For example, the weaned steer calf, two-year old lactating cow and mature bull all require the five essential

Judge It!

Have four samples of the same type of any of the feeds listed above. Decide which type of beef animals this feed might be fed to. Discuss what the ideal feed should look like and create a list of criteria. Judge the four samples and give reasons for the decisions made.

Discuss as a group, or have a beef farmer as a guest judge, to give a placing for the four samples.

nutrients but in different amounts due to their different functions.

Before they can determine an animal's nutritional requirements, farmers must determine whether the animal's main function should be:

- Maintenance
- Growth
- Production
- Reproduction

Factors other than function that affect the amount of nutrients the animal requires include:

- Environmental factors, such as extreme temperatures and wind
- The animal's frame size and condition score
- Whether the animal is female or male
- The animal's health status
- The age of the animal
- The animal's level of activity

UNDERSTANDING ENERGY

The importance of energy to an animal cannot be overemphasized.

Energy is defined as the ability to do work. All energy originates from the sun. Plants trap energy using photosynthesis. Animals transform this energy from the plants into heat or body products such as milk or meat.

You may have learned in school about the "first law of thermodynamics". It states that energy can neither be created nor destroyed; it is only changed from one form to another. Thus, energy in feeds which is not digested is eliminated from the body. Energy in feeds which is digested and not incorporated into the body products is lost as heat.

We measure the amount of energy in megacalories (Mcal).

1 Mcal = 1,000,000 calories or = 1,000 kilocalories

There are many types of energy. It is important that you understand what these types are and how you can use the information they give you.

GROSS ENERGY (GE):

If we were to burn a feed and measure the total amount of energy released, we would obtain gross or total energy values as follows:

Feed	Gross Energy (Mcal/kg dry matter)
Corn Grain	4.43
Oat Straw	4.43
Oat Grain	4.68
Timothy Hay	4.51
Linseed Meal	5.12

Credit: British Columbia 4-H Beef Member Manual

These values are obtained through scientific experimentation. Note that these values do not tell us how much energy an animal can get from its feed. An animal digests its feed. Digestion is a much slower process than burning.

DIGESTIBLE ENERGY (DE):

Digestible energy is the most popular way to express the energy values of feeds and the energy requirements of the animal. The digestible energy of a feed is the gross energy consumed by the animal minus the energy eliminated or lost in the feces. The fecal energy may be as high as 10 to 70 percent of the energy consumed by the animal, making it the largest loss of energy in digestion.

Cattle digest 60 to 90 percent of the energy in grains and high quality forages. However, in low quality forages such as straw, they digest only 40 to 50 percent of the energy.

METABOLIZABLE ENERGY (ME):

The metabolizable energy is equal to the digestible energy minus the energy in urine and gaseous products of digestion. The cow loses 4 to 5 percent of the gross energy through the urine and approximately 7 percent through the production of methane gas in the urine.

NET ENERGY (NE):

Net energy is equal to the metabolizable energy minus the heat increment. The heat increment is the heat which is produced when feed is taken in and digested.

TOTAL DIGESTIBLE NUTRIENTS (TDN):

TDN is an old system of measuring the available energy of feeds and the requirements of animals. It is hard to measure, inaccurate, and very confusing.

The formula for the calculation of TDN is:

$$\begin{aligned} \text{TDN\%} &= (\% \text{Crude Protein} \times \% \text{Digestibility}) \\ &+ (\% \text{Crude Fiber} \times \% \text{Digestibility}) \\ &+ (\% \text{Nitrogen-free Extract} \times \% \text{Digestibility}) \\ &+ (\% \text{Ether Extract} \times \% \text{Digestibility} \times 2.25) \end{aligned}$$

All of the energy consumed is made into one of these:

- fat
- heat
- wastes - feces, gas, urine
- body products - milk, meat, offspring.

Digestible energy is the value most commonly used as it is the easiest to determine and understand. However, it is important to understand all of the values and how they are derived.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about beef animal nutrition through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

**ACTIVITY #1
INJECTABLE VITAMINS & MINERALS**

DO	<p>Time: 20 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">- Various bottles of injectable vitamins and minerals- Information sheet that comes with bottle (if applicable)- Injectable Vitamins & Minerals worksheet <p>Instructions:</p> <ul style="list-style-type: none">- Have members work in small groups- Give each member a worksheet- Explain the worksheet and have members answer the questions- Have each group present their findings about their particular bottle
REFLECT	<p>Learning Outcomes:</p> <p>To have members appreciate what information is given on the bottle (and on the information sheet) so they become more responsible when handling vitamins, minerals and medications when they are older and administering some of these. Members will also work on their communication skills as they present their findings to the rest of the group.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Why is it important to know and understand the information on a bottle of injectable vitamins/minerals?- Was it easy or hard to fill out the worksheet?- What do you think might happen if the contents of the bottle were administered improperly?

ACTIVITY #1 WORKSHEET INJECTABLE VITAMINS & MINERALS

Answer the following questions:

1. What is the name of the vitamin/mineral that is in the bottle?

2. What type of animals can it be administered to?

3. How much should be given? (i.e. how many mL/the body weight given as a base)

4. How is it to be injected? (intramuscular, subcutaneously or intravenous)

5. How often should it be given?

6. Are there any side effects?

7. Does it need to be refrigerated?

8. What is the expiration date on the bottle?

AT HOME ACTIVITY

Find a feed tag from a bag of vitamin/mineral supplement. Check to see what kind of information it contains. You should find an analysis of the feed. You may also find instructions about how much of the supplement to feed an animal.

Take a look at a vitamin/mineral supplement for humans and compare the labels.

DIGGING DEEPER FOR SENIOR MEMBERS

Find out what the cost of a bag of vitamin/mineral supplement is and look at the tag for that particular product. Figure out how much supplement a 700 pound beef steer should be fed each day and figure out the cost per day.

UNIT 3C – IMPORTANCE OF WATER

SETTING OBJECTIVES:

Cattle need access to water of adequate quality and quantity to fulfill their physiological needs. Members will gain an appreciation of the importance of water when raising beef cattle and learn ways of conservation to ensure a plentiful, sustainable supply of quality water for cattle for many years to come.

Suggested Lesson Outcomes

- To understand why the body needs water
- To gain an appreciation of how much water a beef animal consumes in a day
- To discover what an appropriate watering system for a beef animal is
- To understand why water quality is so important for animals

ROLL CALLS

- On average, how much water do you think a lactating beef cow with a calf drinks in one day? (answer - 55 litres, Source: OMAFRA)
- Name something water does for the body.
- What is a sign that a beef animal is not getting enough water?

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information What Does Water Do? How much water does a beef animal need? How can you tell if your beef animal is getting enough water? Activity #1 Journey 2050 – Lesson 3 - Water	30 min + Activities
At Home Activity	Water Testing	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

Water helps the body to function in so many different ways we really couldn't live without it - and neither can cattle. We don't often think of water as an important nutrient but it is necessary for life.

WHAT DOES WATER DO?

Water does many things:

- helps the body get rid of waste
- helps things transport through the body
- lubricates the joints
- participates in body activities
- helps keep the body healthy

Check It Out!

Visit Section 2 of the Beef Cattle Code of Practice for information about water. For the complete document, including appendices, visit www.nfacc.ca/codes-of-practice/beef-cattle

How much water does an animal need?

The amount of water your animal needs depends on many things: body size, weight, feed consumed, the environment and the type of animal. Water should be available free choice for your animal at all times.

Beef Cattle Type	Water Consumption by Beef Cattle		
	Weight Range (kg)	Water Requirement Range ^a (L/day)	Average Typical Water Use ^b (L/day)
Feedlot cattle: Backgrounder	181-364 (400-800 lb)	15-40	25
Feedlot cattle: Short keep	364-636 (800-1,400 lb)	27-55	41
Lactating cows with calves	-	43-67	55
Dry cows, bred heifers & bulls	-	22-54	38

^a A result of the animals' environment and management.

^b Typical consumption over a year on a daily basis under average agricultural conditions in Ontario.

Credit: OMAFRA Water Requirements of Livestock Factsheet <http://www.omafra.gov.on.ca/english/engineer/facts/07-023.htm#2>

Snow is used as a water source in some beef operations in Ontario but is used more extensively in western Canadian provinces. There is scientific evidence that cattle can maintain body condition using loose snow for water under certain specific conditions. It is extremely important to ensure there is a sufficient supply of loose, clean snow. It can take inexperienced cattle

several days to learn to consume snow as a primary water source so they should be monitored during the acclimation period. Using snow as a sole winter water source is not appropriate in all geographic areas, even within the same province.

How can you tell if your animal is getting enough water?

The first sign you will notice if your animal is not getting enough water is a decrease in feed intake.

Water quality is important for all livestock. An abundant supply of clean, fresh water should always be available for all your animals. Water quality and palatability affect water consumption. Cattle may limit their water intake to the point of dehydration if the quality of drinking water is compromised.

Recommended Practices

- ensure that water sources are easy for cattle to locate and access
- manage cattle and water sources to avoid competition that would limit access to water
- check automated water sources daily to ensure they are dispensing properly
- test water quality in the event of problems such as poor performance, reluctance to drink, or reduced feed consumption
- if utilizing natural water sources, provide water in troughs or bowls wherever possible to ensure cleanliness of water supply and safe animal access
- be aware of the signs of stray (tingle) voltage around water sources, such as reluctance to drink or reduced feed consumption
- if using a frozen-over natural water source in winter, provide an area of open water and restrict cattle from areas of thin ice.

Experience It!

Visit a local farm supply store and look at the various watering systems available for beef cattle. Decide which waterbowl would work best for various types of beef cattle (i.e. backgrounders, feedlot, cow-calf – indoor barn, outdoor feedlot, pasture)

Research It!

What other signs will an animal exhibit if it is not getting enough water?

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about beef animal nutrition through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

Judge It!

Have four different types of waterbowls for beef cattle (or pictures of waterbowls). For the intent of this activity, decide which type of beef animals will be using the waterbowls and how many cattle are in the group. Discuss what the ideal waterbowl should look like and create a list of criteria. Judge the four samples and give reasons for the decisions made.

Discuss as a group which would be the most appropriate waterbowl for the type of number of beef animals using the waterbowl.

ACTIVITY #1
JOURNEY 2050 – LESSON 3 - WATER

<p style="text-align: center; font-weight: bold; color: white;">DO</p>	<p>Time: 45 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> - Computer/electronic device - Internet connection <p>Instructions:</p> <ul style="list-style-type: none"> - Either as a large group or by dividing members into small groups, visit https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=584 for the Journey 2050 lesson on water. - Follow the instructions given on the website to work through the lesson. - With the entire group, review the processing prompts questions found below.
<p style="text-align: center; font-weight: bold; color: white;">REFLECT</p>	<p>Learning Outcomes:</p> <p>Members will discuss the limited amount of fresh water on earth, identify how best management practices can reduce water consumption, discuss the need for water conservation and protection related to population growth and agriculture, and compare and contrast methods of irrigation for water conservation.</p>
<p style="text-align: center; font-weight: bold; color: white;">APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - How is water used within a beef farm? - Was there information in the activity that surprised you? Was there something that you didn't know before completing the activity? - What best practices can be implemented to use water most efficiently in agriculture?

AT HOME ACTIVITY

Get a test kit from your local health unit and test the water in your home. When you get the results, review what the test said about your water and research any items that you don't understand from the results. Be prepared to share your findings at a subsequent club meeting.

DIGGING DEEPER FOR SENIOR MEMBERS

Beef cattle on pasture sometimes get water from sources such as ponds, rivers and springs. Environmental issues have changed how this happens though and other options for water have had to be installed in some areas. Research the laws in your area to find out what is permissible and what is not to water cattle when they are on pasture.

DIGGING DEEPER TWO FOR SENIOR MEMBERS

Stray (tingle) voltage can be an issue that causes large production issues on farms. Find out what possible causes there are for stray voltage and some measures that can be taken to either prevent or correct the issue.

UNIT 3D – FEEDS FOR BEEF

SETTING OBJECTIVES:

Once members have learned how the digestive system works and what the nutrient requirements are for beef cattle, the next step is to create balanced rations for beef cattle in all stages of the production cycle. In order to do that, members have to have a good understanding of the various feed stuffs available and the benefits and nutritional analysis of each of these feedstuffs.

Suggested Lesson Outcomes

- To learn what a ration is
- To be able to identify various feedstuffs for cattle and their benefits
- To understand what factors influence feed intake and what dry matter means
- To learn about feed sampling and feed analysis
- To see the differences in nutrition between the various stages of the beef cattle cycle

ROLL CALLS

- Name a feed ingredient that is used in a ration.
- Name one thing that affects the amount of feed a beef animal will eat.
- When a feed ration is being analyzed, what is one piece of information you will learn about the feed?

SAMPLE MEETING AGENDA Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Rations and Diets Roughages and Grains Feed Intake Dry Matter Feed Sampling Feeding for All Stages of Beef Cattle Activity #1 Steps for Formulating Rations	40 min + Activities
At Home Activity	Reading Labels	5 min
Wrap up, Adjournment & Social Time		10 min

NOTE: This section could be split into two meetings depending on the content and activities chosen.

TOPIC INFORMATION

RATIONS AND DIETS

Diet

A diet is the mixture or combination of feeds which provide the nutrient requirements. The diet you feed your animal contains those nutrients which keep your animal healthy, growing, producing and reproducing.

Ration

A ration is the amount of feed required by the animal daily. The diet must contain the correct proportion of the nutrients the animal needs. The correct amount of a properly balanced diet gives you a ration which meets the animal's dietary requirements.

MORE ABOUT RATIONS AND DIETS

Producers typically provide roughages, concentrates as well as supplements. What producers feed their cattle depends a lot on what feedstuffs are available to them.

Roughages

Roughages are high in fibre. Roughages include hay, silage, straw and other forages.

Concentrates

Concentrates are high in energy or high in protein and are low in fibre. Concentrates are typically grains such as barley or wheat.

Supplements

Supplements are a good source of one or more nutrients. They are man-made and may be added to the ration to correct or prevent a nutrient deficiency, or in other words, balance the ration. They may provide energy, proteins, vitamins or minerals. Salt is a mineral supplement. Salt, or sodium chloride, is important for the animal because it loses sodium and chloride through sweat and body wastes. Your animal can receive salt by licking a block or eating loose salt mixed in with the feed.

Palatability

Palatability is how acceptable the feed is to the animal. Palatability is affected by the flavour, smell, appearance, texture, temperature and dustiness of the feed. The way the feed is prepared will affect each of these. Your animal must eat enough of its ration to get the daily gains you want. If it does not eat enough, it won't get those gains and the feed and the nutrients in the feed will be wasted.

Experience It!

Look at samples of various feeds. Working as a group, put them in order of the most palatable to the least. Be ready to explain your group's decision.

ABOUT ROUGHAGES

Hay

Hay is dried roughage which is harvested and stored with a low moisture content.

Two types of roughages are used for hay crops:

1. grasses
2. legumes - clover, alfalfa, trefoil.

The most common ways in which hay is packaged today are:

1. Small square bales weighing from 20 to 30 kgs.
2. Large round bales weighing from 300 to 600 kgs.
3. Loose hay stacks weighing from 1 to 3 tonnes.
4. Large square bales weighing about 500 kgs.

Haylage

Haylage is produced from grasses and legumes. Instead of being stored as long hay, it is chopped into shorter pieces by a forage harvester. The main difference between hay and haylage is that haylage has a higher moisture content - around 40%. It is stored in either a tower silo, pit (bunk) silo or a silo bag.

Silage

The entire corn plant is cut approximately 4 to 10 inches off of the ground and is chopped into small pieces by a corn harvester. It is stored in either a tower silo, pit (bunk) silo or silo bag and is harvested with a moisture content of approximately 60-70% moisture.

ABOUT THE GRAINS

The grains are concentrates. These are the energy feeds.

Wheat

Wheat is high in energy. It should be coarsely ground or cracked and fed in small amounts along with other grains. Fine particles of wheat appear when it is processed and may cause digestive upsets or bloat.

Judge It!

Have four samples of the same type of any of the feeds listed in this section. Decide which type of beef animals this feed might be fed to. Discuss what the ideal feed should look like and create a list of criteria. Judge the four samples and give reasons for the decisions made.

Discuss as a group, or have a beef farmer as a guest judge, to give a placing for the four samples.

Barley

Barley is the energy source used most often in Alberta feedlots. It has less energy than wheat but more than oats. Barley is a very dense feed. If you compare the weight of a pail of barley with the weight of a similar pail of oats, the barley pail will be much heavier. Therefore, it is important to measure your grains by weight, not by volume.

Oats

Oats are very palatable. They are good to use when starting your animal on grain. However, because oats have less energy than wheat or barley, oats are not a very good finishing feed.

Corn

In most parts of North America, including Ontario, corn is the most commonly used energy feed. However, in Alberta, very little corn is used because most Alberta climate conditions are not suited for growing corn. Corn is low in calcium, but has a good phosphorus content. In most cattle diets, corn is fed along with protein supplements.

Feed Intake

Beef cattle will eat from 1.4 to 2.7 percent of their body weight each day in feed. This amount is on a dry matter or moisture free basis. The amount consumed varies depending on the concentrate roughage ratio of the feed and the age and condition of the animal. Older and more fleshy cattle will consume less feed per unit of body weight than younger, leaner animals.

The table below lists the approximate amounts of different types of feed an animal will eat.

These are based on a 90% dry matter basis.

Feedstuff	Daily Consumption as a Percentage of Body Weight
Excellent quality hay	3
Very good quality hay	2.5
Medium quality hay	2
Poor hay, oat or barley straw	1.5
Wheat straw	1
Silage (air dry basis)	2-3
Oats	3
Barley	2.5
Wheat	1.5-2

Credit: British Columbia 4-H Beef Member Manual

What do we mean when we say “on a dry matter basis”? If your haylage has 40% moisture, then it has 60% dry matter - because the dry matter plus the moisture makes up the haylage or 100%. If you feed 10 kilograms of haylage then you are only feeding 6 kilograms of dry matter.

FEED INTAKE

There are many factors which can affect how much feed your animal can eat. You need to know about these because they will affect the types and amounts of feeds and ingredients your animal will eat.

Factors Affecting Forage Intake:

Stage of maturity: The fibre content of forages increases as the forage matures. Higher levels of fibre in forage will reduce feed intake.

Weathering: Mould growth will reduce intake.

Forage Species: Cattle will consume greater amounts of legumes than grasses.

Physical Form: Grinding will increase forage intake.

Grain Feeding: Grain feeding will depress feed intake, especially if grain is fed before forage.

Fermentation: Consumption of silage, on a dry matter basis, will be less than if the same quality and dry matter of hay is fed.

FACTORS AFFECTING DRY MATTER INTAKE:

Cattle Status: Thin cattle will consume more than cattle in normal condition. Older and more fleshy cattle will consume less than younger, leaner cattle. Lactating cows will eat 40-60% more than dry cows.

Weather: Cold weather will cause feed intake to increase. Warm weather will cause intake to decrease.

Nutrients: An animal which has a nutrient deficiency will have a decreased intake of dry matter.

What does all this mean?

You can use this information to decide how to adjust your animal's diet when you must change the feed ingredients. For example, if you are into some better quality hay, you can decrease the amount you need to feed.

You can also use this information when deciding how to feed. For example, you will need to feed a group of thinner cows more than a group of older, more fleshy cows.

If the weather becomes colder, you will need to increase the feed available for your animals.

DRY MATTER/MOISTURE FREE

Suppose your hay had 13% moisture. Then, it would have 87% dry matter (DM). The results you receive on your feeds may be calculated on a dry matter, a moisture-free or an as-fed basis. It is important that you are able to convert them to the format you require. Keep these formulae in mind:

$$\%DM = \frac{(100 - \%moisture)}{100}$$

$$\text{Nutrient Conc.} = \text{Nutrient Conc.} \times \%DM$$

(As-Fed)

(Moisture Free)

FEED PROCESSING

1. Roller Mill

The roller mill crushes the grain to a flat, flake like structure. There will be fewer fine particles in the feed.

2. Hammermill

The grain is bashed around in the roller mill until it is small enough to fall through the screens. The holes in the screens can be varied from 1/8 to 1/2 inch in diameter. Feed companies use the hammermill to prepare feeds for pelleting.

3. Pelleting

Fats and/or molasses are added to the feed ingredients during mixing. They help the pellet hold its shape as it hardens, and reduce dustiness. Vitamin and mineral supplements are spread evenly through the feed during pelleting.

These are the steps followed in pelleting feeds:

1. The ration is mixed.
2. The feed is put through the hammermill.
3. Feed moves into a steam chamber where moisture is added.
4. The feed is forced through a die to shape the pellet.
5. The pellets are put in the cooler to firm and harden.

USING COMPUTERS FOR RATION FORMULATION

Today, there are many computer programs available for formulating rations for beef cattle. These programs are constantly being revised and updated as new information and technology become available.

Experience It!

Visit a farm or a local feed mill for a tour to see some or all of the above ways of processing grains.

FEED SAMPLING

A balanced ration is one that supplies nutrients in the proper amount and proportion for an animal's function. To formulate a balanced ration you'll need to know the animal's nutrient requirements, in addition to how nutritious your feed is.

In order for you to make the best use of your feeds, you need to know exactly what is in each feed. Underfeeding livestock will limit their production potential. Overfeeding livestock will waste your valuable resources. The best way to find out more information about your feed is to have it analyzed. This test can tell you a lot - including, but not limited to the level of nutrients in your sample, the moisture level and how easily digestible it is. Having feed analyzed will help you decide if supplements are necessary, and if they are, the type and amount needed to achieve a balanced ration.

A properly formulated ration supplies adequate amounts of all nutrients to allow cattle to achieve a desired level of production. Accurate ration formulation requires:

1. precise description of the class of cattle (sex, weight, frame size, body condition, desired rate of gain, stage of production)
2. knowledge of management practices utilized (implant usage, feed additives)
3. accurate description of the nutrient content of the available feeds

Check It Out!

Check with your local feed company or crops input supply company to see if they offer feed sample testing. Find out if there is a fee and what types of feeds they will analyze.

TAKING SAMPLES

Sample each of your feeds before the feeding period begins so you can use the results to help you develop the best feeding program possible. Whenever possible, sample your feeds at harvest time. Each type of feed you will use should be analyzed separately because different forage species, mixtures and cuttings, and even grains and forages from different fields, vary in nutrient content.

Baled Roughages: using a core sampling tool, take subsamples from at least 20 different bales or places in the stack. Place all samples directly into one bag.

Silage or Loose Roughages: by hand, take subsamples from at least 20 places in the stack or silo. Put them in a pail and mix thoroughly. Then take a sample from the pail and put it into the plastic bag. Sample should be submitted as soon as possible to minimize moisture loss.

Grains or Complete Feeds: take at least 20 subsamples from different locations in the bin. Put the samples in a pail and mix thoroughly. Take a sample from the pail and place it in a plastic sample bag.

WHAT IS ANALYZED?

A regular analysis of your sample will give this information:

- moisture content
- pH (acidity of silage materials)
- crude protein content
- calcium content
- phosphorus content
- acid detergent fibre content (roughages only)
- nitrate content (roughages only)
- bushel weight (grains only).

Reach Out!

Invite a veterinarian, cattle nutritionist, local feed salesman or a staff person from a feed analysis laboratory as a guest speaker at your meeting.

If you suspect a problem, you may also, (possibly for an additional charge), have other items analyzed. These would include the minerals.

FEEDING FOR ALL STAGES OF BEEF CATTLE

Beef Cow Nutrition

The body condition of cows at the start of the winter feeding period has a major effect on the amount and quality of feed required. Cows have greater difficulty gaining weight in cold winter conditions than during fall when temperatures are warmer. Thin cows must gain weight throughout the winter feeding period. They require a good quality forage or average quality forage with supplemental grain or pellets.

Cows in good condition in the fall do not need to gain actual body weight. They need enough feed to gain weight equal to the weight of the calf and calf bed. This usually amounts to 150 to 180 lb. of gain in an average sized cow. This mass is lost the day the calf is born. Average quality hay fed with small amounts of grain or pellets should meet the winter feed requirements of these cattle. If your cows are in good condition (a body score of three to 3.5), select rations that will give zero lb. of average daily gain. The rations in this guide have been designed to account for the weight of the fetus and calf bed.

Sudden drops in temperature during the winter months will cause cows to consume more feed. If cows are fed poor quality feeds such as straw, they will attempt to consume more than they can digest and may become impacted. Processing the poor quality feed through a hammer mill or tub grinder will only increase feed intake which increases the potential for impaction when sudden drops in temperatures occur.

Divide the Herd into Different Feed Groups:

- Group I - Mature Cows in Good Condition - Average quality hay supplemented with grain or pellets, minerals, fortified salt and vitamins, will generally meet the nutritional needs of this group.

- Group II - Bred Replacement Heifers and Second Calf Heifers -These young growing animals do not compete effectively for feed with the mature cows. The heifers require good quality hay and extra grain to meet their needs for growth and development. These animals are gaining body weight in addition to the developing fetus.
- Group III - Thin and Old Cows - These cows will need extra energy to get them through the winter. Some older cows may have hardware disease or may not have sound teeth.

Feed analyses provide important information on the nutrient levels of the feeds and should be used to accurately formulate rations.

If the ration is based on straw or low quality hay, or if feed intake is limited it is more important to separate the herd into different feeding groups to match the nutritional needs of each group.

If the cow herd cannot be divided into three groups, heifers and the thin or old cows could be fed together. A second option is to cull the thin or old cows rather than trying to feed them over the winter.

60 Days Prior to Calving

Decrease the amount of roughage fed by approximately 15 per cent and increase the amount of grain or pellets fed by 15 per cent. The capacity of the rumen decreases as the fetus develops, especially during the last half of the third trimester. As the unborn calf develops, it occupies more and more space within the body cavity reducing the space available for bulky feed. Grain or pellets take up less room and are more nutrient dense than roughage.

After Calving - Lactation

Milk production places a significant increase on the cow's requirements for energy, protein and minerals. When feeding high grain rations or high volumes of pellets, feed one-half of the grain or pellets in the morning and the other half in the afternoon. A 1,200 lb. cow can safely eat about seven to eight lb. of grain or pellets at one feeding. Ensure there is adequate feed bunk space to minimize crowding. The larger or more aggressive cows will often eat more than their share of concentrate. Smaller or less aggressive cows may not have access to their share.

Reduce or eliminate forced feeding of straw after calving. Most straw rations do not provide adequate levels of energy during the lactation period. If cattle are fed a straw-grain ration, provide a good quality protein supplement such as canola meal, alfalfa pellets or a commercial beef protein supplement after calving. Adding any type of hay, even slough hay, to a straw ration will improve the nutrient supply to the cow.

If cows and calves are on pasture, monitor the forage quality and supplement feed as needed.

Herd Sire Nutrition

Breeding Period & Maintenance Period

There are two phases of the feeding cycle for herd sires: The breeding period and the maintenance period.

Feeding for the breeding period starts about six weeks before the breeding season and continues throughout the breeding season. During the breeding season, the bull must be in very

good condition and physical shape. He is more active at this time than during the rest of the year because he is breeding cows and heifers.

The maintenance period is the remainder of the year between breeding periods. A well-balanced diet providing the correct amount and types of nutrients is needed to ensure there are no nutritional deficiencies. Winter is generally considered the maintenance period. Proper conditioning of bulls is important because bull fertility has a major impact on determining whether a cow will conceive and whether they calve early or late in the calving season which in turn influences calf weaning weight and uniformity.

Nutritional Deficiencies

Two common nutritional deficiencies in bulls are phosphorus deficiencies and vitamin A deficiencies. Both can lead to great difficulty in breeding. A producer can ensure the bull gets enough phosphorus by supplementing forages with grains. A mature bull needs at least 25 grams of phosphorus per day.

Grains and dry forages are both often low in vitamin A. Green feeds, such as alfalfa or other immature forages are often high in vitamin A. The best indicator of forage being mature is if it has been cut for more than 90 days. It's around that point that the vitamin's precursors are losing strength so the vitamin will not be converted into a useful form in the animal's body. The liver of the beef animal actually stores vitamin A for up to four months, so deficiencies will only occur if the bull has been deficient for several months.

If their animal seems to have a deficiency, producers can provide their bulls with supplements to ensure they are receiving about 60,000 IU of vitamin A per day. Use supplements like a salt-mineral mix, green feeds such as alfalfa or ADE injections.

If a bull is in poor condition prior to the beginning of the breeding season, increase his level of nutrition to get him into good condition before breeding season starts.

Calf Nutrition

Creep-feeding is the practice of providing supplemental feed to calves in order to increase their average daily gain and weaning weight. Creep-feeding can be a useful management tool under different scenarios. For example when milk production declines or pasture growth is inadequate to maintain normal calf growth or when pasture quality declines later in the season.

The normal milk production curve of a beef cow decreases in late summer and fall and would not meet the increasing nutrient demand of the growing calf. In addition, as the grazing season progresses, pastures decline in feed quality and quantity. The creep feed is expected to make up for the calf's nutrient requirements not supplied by the dam's milk. Milk production of the cow will depend on several factors such as breed, age, weather and the pasture make-up (presence of legumes).

When to creep-feed

Creep-feeding should be treated as a management decision rather than a routine practice. It is important to evaluate your reasons for getting your calves onto dry feed before weaning and to creep-feed at the appropriate time.

If there is reduced milk production, creep-feeding can then be used as a substitute for milk or forage thereby reducing nursing pressure on the cow. First-calf heifers and old cows may not produce enough milk that will support a growing calf, especially if the calf has excellent genetic potential for growth. A calf's first preference is milk, then a highly palatable creep feed, and lastly forage. The average beef cow produces between 4.5 and 9 kg (10 and 20 lb.) of milk per day. Heifers will produce less than a mature beef cow. A beef cow's milk production peaks at about two months after calving and then begins to decline gradually.

Consequently, this creates a nutritional gap between what the calf requires to sustain its potential for growth and what the calf can obtain from the dam's milk and the available forage in the pasture. Some form of supplemental feed can be used to maintain the continued normal growth rate on the calves during the nutritional gap. Otherwise, the calf's growth rate will be less than what it could be if sufficient nutrients were available.

Even though calves can be creep-fed throughout the entire summer, it is of more value when forage supply or quality or both are low. Creep feeding is most effective during drought or whenever quantity or quality of the pasture does not meet the calf's nutritional requirements for growth. When milk and creep-feed are available, the creep-feed will be substituted for forage. Under poor growth conditions, creep-feeding may conserve enough forage to maintain pasture condition. It is estimated that for every 0.5 kg (one lb.) of creep-feed consumed by the calf, there is a saving of 0.25 to 0.5 kg (0.5 to one lb.) of forage. When creep-feed is provided for calves, there will be more forage available for the cows which may leave room for increased stocking rates.

It may be appropriate to creep-feed calves that were born late or after the calving season as a strategy to increase their weaning weight. The typical growth rate for beef calves is between 0.8 to 1.2 kg per day (1.75 to 2.75 lb. per day) from birth through to weaning. However, increasing the weight of calves may attract price discounts for heavier calves. Employing this practice may be necessary if you want to take advantage of low grain prices or you have large framed calves that are destined for the feedlot immediately after weaning.

Types of creep-feeds to meet nutrient requirements of the calf

The type of creep feed to use depends on the quantity and quality of forage available in the pasture. Energy or protein creep feeds can be available to producers. The energy content of pastures decreases late in the growing season while dormant or mature pastures will be deficient in protein. Late-season forages and stockpiled forages will not have enough protein to meet the cow's lactation needs, or sustain normal levels of growth in the calf.

Energy creep-feeds can be made up of on-farm grains, such as oats or barley (either whole, cracked or rolled). Sources of protein creep-feeds include soybean meal, canola meal, dehydrated alfalfa pellets, or a commercial protein supplement without urea. A protein source with urea should not be used in a creep-feed for young calves since they do not have a fully functional rumen. Commercially available, nutritionally balanced, creep-feeds in a pellet form can be more convenient to use and often will be of similar or lower cost to those made up on the farm.

In situations where forage quantity may be more limited, but the energy and protein may be more adequate, utilizing a creep feed with a protein content of 13 per cent would be the appropriate choice. For situations where quantity of forage may be less of an issue, but where

the forage quality is lower, (such as in late summer with more mature forage or on stockpiled forages), a creep-feed with 16 per cent protein would be recommended.

In order to meet the requirements of a growing calf, the energy content of creep-feed should be in the range of 65 per cent to 70 per cent Total Digestible Nutrients (TDN) (2.9 to 3.1 Mcal/kg digestible energy) and about 13 per cent protein. The creep-feed should have calcium and phosphorus levels of 0.7 per cent and 0.5 per cent, respectively, of the dry matter content. Vitamins A, D and E, and a trace mineralized salt should also be included.

Some considerations when starting calves on creep-feed

Creep-feeding can facilitate early weaning, particularly during a dry year. The creep-feed gets the calves accustomed to consuming dry feed. The creep-feeder should be portable, keep the feed dry and be capable of holding a week's supply of creep-feed. The feeder should keep the cows out while allowing the calves to enter.

To start calves on creep-feed, the feeder should be placed near watering sources where the herd congregates. Once the calves have started to use the feeder, it can be moved to other areas of the pasture to encourage grazing in less-used areas. The feeder can be a useful tool during dry years to "lead" the herd to use the areas they might otherwise avoid.

Calves can be weaned successfully at about 180 kg (400 lb.). These young, weaned calves can be placed on a nutritional program to maintain their normal growth of 0.8 to 1.2 kg/day (1.75 to 2.75 lb./day). They will be able to achieve their normal weaning weights at their usual weaning dates and, at the same time, do it more efficiently.

The feed conversion of early weaned calves on dry feed is much better than the overall feed conversion of the cow nursing her calf. The feed requirements for the cows will be reduced once the calves are weaned, and it will allow them to maintain or regain their body condition on less feed. Cows entering the winter season in good body condition are the cheapest cows to over-winter. This will result in substantial feed savings and reduced costs for the cattle enterprise.

Backgrounder/Stocker Nutrition

There are many types of backgrounding or growing systems for beef cattle. The objectives of a backgrounding operation are to grow young/lightweight cattle to prepare for summer pasture or feedlot finishing. The most common system is to use high-forage diets to grow cattle from .5 – 1kg (1 – 2 lb)/day through the winter.

The primary objective of backgrounding is to ensure optimal growth and development of the muscle and frame of the calf, while avoiding excess fat deposition.

Many backgrounding rations contain 60 to 70 per cent forage (dry matter basis), with the balance comprised of grain or fortified pelleted grain screenings. As the backgrounded calves mature, the energy component or Total Digestible Nutrients (TDN) of the rations is gradually raised by increasing the amount of grain or pellets fed.

Most backgrounding rations require additional salt and minerals. Trace Mineralized Fortified Salt (TM Fortified Salt) is recommended. In addition to cobalt and iodine, it contains a number of required trace minerals (copper, zinc, manganese and sometimes selenium). Research has demonstrated that these trace minerals are commonly deficient in Saskatchewan-grown forages

and grains used for beef cattle production.

Calcium and phosphorus are important for proper skeletal growth and development in backgrounded calves. If the forage and grain component of the ration does not supply adequate levels of these minerals, the animals must be provided a mineral supplement.

Feedlot Nutrition

Beef production in a feedlot begins with a diet made up of forages and is changed slowly until it is comprised of about 90 per cent grain. Grain-finishing produces tender, marbled beef. Cattle will typically spend 60 to 200 days in a feedlot where they are fed nutritionally balanced rations until they reach the optimum weight for being sold to a processing plant.

Feeding rations change as animals go through the finishing process. The starter feed ration for a 450 lb to 600 lb animal coming off pasture into the feedlot should be high in roughage, such as haylage or silage. To compare, the ration for a 1,100 lb to 1,200 lb steer that is almost finished is high in grains.

It takes approximately 2.7 kilograms (6 pounds) of feed grain to produce 0.5 kilograms (1 pound) of edible beef. This is comparable to the feed grain conversion efficiency of other major meat animals.

Experience It!

Visit a local cow-calf , backgrounder and/or feedlot to find out what their feeding program is for their beef cattle.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about beef animal nutrition through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

ACTIVITY #1 STEPS FOR FORMULATING RATIONS

DO	<p>Time: 20 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">- Steps for Formulating Rations worksheet- Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">- Give each member a Steps for Formulating Rations worksheet- Explain the worksheet and have members put the ten steps in order- Review the worksheet and discuss each step in the process of formulating rations
REFLECT	<p>Learning Outcomes:</p> <p>To allow members to identify and understand the steps involved in formulating a ration for cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Why is it important to know and understand the steps in formulating a ration for beef cattle?- Was it easy or hard to fill out the worksheet?- Do you now feel comfortable with getting feed analysis done for the feeds on your farm?

ACTIVITY #1 WORKSHEET

STEPS FOR FORMULATING RATIONS

Order these ten steps correctly.

- _____ Compare the results of the feed analysis with the nutritional requirements of the animal(s) being fed to determine the difference between what the feed can provide, and what your animal(s) needs.

- _____ Evaluate your feeding program on an ongoing basis so that you can be proactive when it comes to any issues or necessary changes.

- _____ Determine the nutrient requirements of the animal(s).

- _____ Determine how and where to feed cattle.

- _____ Determine the target or goal estimated finished weight and average daily gain you're aiming to achieve during the feeding period.

- _____ Determine what kind of feed is readily available.

- _____ Determine the primary function of the animal(s). Is it Maintenance, Growth, Production or Reproduction?

- _____ Contact a feed analysis laboratory about conducting an analysis of your feed. You may also Balance the ration by hand or by using ration balancing software. Evaluate and compare various feedstuffs to determine which combination is most cost-efficient.

- _____ Consider factors in addition to function that may affect the amount of nutrients the animal requires. Factors may include the animal's health status, sex, age, frame size, condition score and level of activity, as well as environmental factors.

Credit: 4-H Alberta

AT HOME ACTIVITY

Find a feed tag from a bag of complete feed ration or supplement for beef cattle. Check the tag to see what kind of information it contains. You should find an analysis of the nutrients of the feed. There should also be instructions about how much of the feed to feed an animal. Take a look at some of the foods in your kitchen. They will also have nutritional information on their labels.

DIGGING DEEPER FOR SENIOR MEMBERS THE COST OF FEEDING BEEF CATTLE

If you are buying a commercially prepared feed, you will know how much it costs to feed your beef animal(s). But, if you are using grain or a ration mixed on your farm, you will have to do some calculating to know what it costs per kilogram.

One very important part of managing a successful beef operation is being aware of feed costs. The largest expense, other than the purchase of the cattle, will be the feed used to raise cattle. You should be well aware of the cost of every type of feed which cattle will consume. You may not know exactly how much it costs to produce a bale of hay, a ton of hay, a kilogram of grain corn etc., but you can work out approximate costs. You can either calculate the cost of feeds based on the cost production or you can find out what you would have to pay for hay or grain if you had to purchase it.

You will also want to know how much it costs to feed your beef animal(s) each day. Try keeping track of how much feed your beef animal(s) consumes in one week. Record the following:

- Number of bales of hay eaten in one week
- Price per bale of hay
- Number of kilograms of ration (grains, silage, haylage, etc.) eaten in one week.
- Price per kilogram of grain.

At the end of the week

- Multiply the number of bales times the cost per bale
- Multiply the number of kilograms of ration used times the cost per kilogram
- Add the two numbers together
- Divide by seven
- Divide by the number of animals eating the feed

This will give you the cost per day per animal.

If the cattle are background or feedlot cattle you will want to go one step further and figure out the cost of feed per pound of gain. This is usually a longer term process as you will need the weight of the cattle when they arrive and go on feed and their final weight when they leave the farm.

HERD HEALTH



UNIT 4A: HERD HEALTH PLANNING

SETTING OBJECTIVES:

Taking care of animals is a huge responsibility. Many factors make up good animal welfare, including animal health. There are many facets to both preventative herd health as well as taking care of those animals that do become sick.

Suggested Lesson Outcomes

- To understand the importance of herd health planning
- To be able to identify symptoms and signs of sick animals
- To understand available treatments and protocols
- To learn about preventative medicine
- To learn about certain zoonotic diseases
- To understand the importance of record keeping

ROLL CALLS

- Name one sign a beef animal shows when it is not healthy.
- Name one reason why animal health is important to a beef farmer.
- What characteristics should a beef animal show if it is healthy?

SAMPLE MEETING AGENDA Time: 2 hours 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Herd Health Plan The Healthy Calf You Suspect Your Animal is Sick Vital Signs of Cattle Taking Your Animal's Temperature Working with Your Veterinarian Looking at Medicine (oral and injectable) Vaccinations Herd Health and Management Calendar Biosecurity Rabies Ringworm Record Keeping	90 min + Activities
At Home Activity	Herd Health Plan	5 min
Wrap up, Adjournment & Social Time		10 min

NOTE: This section could be split into two meetings depending on the content and activities chosen.

TOPIC INFORMATION

HERD HEALTH PLANNING

When it comes to keeping cattle healthy, it's important that producers work with their veterinarian on a prevention-focused Herd Health Plan. The time and money spent preventing injury, illness and disease is usually much less costly to producers than treating an individual animal or the whole herd. That's why having a Herd Health Plan is such an important part of an overall animal husbandry and management program.

Because each herd is different, there is no one-size-fits all approach when it comes to creating a Herd Health Plan. So, producers should work with their veterinarian to create a yearly plan that works best for their herd.

A typical Herd Health Planning session with your veterinarian may cover the following topics:

- How to create a healthy living environment for animals
- A vaccination program and parasite control
- What to watch for when monitoring or observing animals
- What to do if one suspects an animal is sick or unhealthy
- Preventing exposure to sickness or disease and preventing its spread if exposure occurs
- Proper record keeping

One of the most important things that producers can do to keep their animals healthy is provide them with a safe and healthy living environment. An environment where:

- Stress and discomfort are minimized
- Normal behaviours can be expressed
- There is nutritious feed and plenty of quality water or snow

THE HEALTHY CALF

As you get to know your calf and the animals in your herd, you will know what kind of signs and behaviour indicate good health. A normal, healthy calf has these characteristics:

- bright, clear eyes
- eats regularly
- drinks water provided
- is active
- has a shiny hair coat
- has pleasant breath

KEEPING YOUR ANIMALS HEALTHY

Help to keep your animals healthy by giving them:

1. A dry, clean home.
2. Clean, fresh water.
3. Well balanced diets containing the right amounts of all the nutrients.

Discuss It!

What signs and behaviours do you think indicate poor health in a beef calf?

YOU SUSPECT YOUR ANIMAL IS SICK

Observe, observe, observe! Producers who carefully monitor their herd are more familiar with their animals and will therefore have a better idea of what's normal and abnormal for them. Generally, healthy animals have the following characteristics:

- Consumes feed provided, ruminates and manure is normal
- Consumes water or snow and urine is normal
- Has a shiny coat, bright and clear eyes, bright and clear nose, upright ears and is in good condition
- Is alert and exhibits normal behaviours
- Stands easily and walks with a normal gait.

If a producer has observed a visible injury or an abnormality in an animal's appetite, manure, urine, condition, behaviour, stance or gait they should examine the animal carefully. Note any symptoms, such as abdominal swelling or discharge from the eyes, nose or mouth and check the animal's vital signs. Look for some of these signs that something is wrong:

Appearance	- depressed - dull
Posture	- standing differently from normal - favouring some part of the body
Gait	- walks faster or slower than normal - walks around more or less than normal - stands in one spot - wanders aimlessly
Condition	- too fat or too thin

Appetite	<ul style="list-style-type: none"> - eating more or less than normal - growing too fast or too slow - refusing to eat certain foods - drinking more or less water than normal
Behaviour	<ul style="list-style-type: none"> - bawling - nervous
Breath	<ul style="list-style-type: none"> - smells sour
Urine	<ul style="list-style-type: none"> - not yellow and clear
Manure	<ul style="list-style-type: none"> - softer or harder than normal - colour different than normal

VITAL SIGNS OF CATTLE

The **temperature** of cattle may vary depending on a number of factors (such as age, recent physical activity, stage of digestion or gestation, time of day or environmental factors) but when measured with a rectal thermometer, the normal temperature should be 38 - 39 degrees Celsius.

The **heart rate** can be measured with two fingers on the animal's pulse, in one minute you should count 40-80 beats.

The **breathing rate** of an animal at rest should be 10-30 breaths per minute. When observing the breath, see if the animal is having any difficulty by listening to and watching the breaths. Remember, normal breathing should be noiseless except when the animal is exercising or at work.

Producers may then call their veterinarian and explain the injury or the symptoms they have observed and recorded. The veterinarian will provide a diagnosis and the appropriate treatment options, which may include medication.

For any medication that is given, it's important to follow the veterinarian's and the manufacturer's instructions in regards to handling, storage and administration. Also be sure to ask about withdrawal periods.

TAKING YOUR ANIMAL'S TEMPERATURE

When an animal looks like it is not feeling well, you may want to take its temperature. Thermometers can be purchased at most livestock supply outlets. The most common thermometer is a blunt-nosed mercury loaded type.

Research It!

Withdrawal periods for medication must be followed but what is a withdrawal period? Find out what it is and what the penalty is for not following it.

Follow these steps when taking the temperature of your beef animal:

1. Tie a piece of string around the end of the thermometer so you can easily pull it out.
2. Moisten the thermometer with mineral oil or vaseline. This will make it easier to insert into the rectum of the animal.
3. Shake the thermometer so that the mercury falls below the lowest level likely to be recorded.
4. Lift the tail and insert about 3/4 the length of the thermometer into the rectum. Leave the thermometer in the animal for at least two minutes.
5. Remove the thermometer and find the top of the mercury line. This will be the temperature of your animal. The normal, healthy animal has a temperature of 38°C. Variations from the normal temperature are not always caused by sickness. Higher temperatures may also be caused by:
 - age - young animals usually have higher temperatures than older animals
 - excitement
 - digestion after a heavy feeding
 - high environmental temperatures
 - time of the day - an animal's temperature is usually higher in the evening than in the morning
 - exercise
 - pregnancy

WORKING WITH YOUR VETERINARIAN

Once you have discovered an unhealthy animal and you cannot solve the problem yourself, you will need to get help. Call your local veterinarian. To make it easier for the vet to find out what is wrong with your animal(s):

- put the sick animal(s) in a separate area
- make it comfortable
- have plenty of warm water available
- have a halter ready
- be ready to discuss the symptoms: how long has the animal been ill; what are the symptoms; any recent changes in management or feed
- be ready to help

Check It Out At Home!

What kind of thermometer do you have in your barn? In your house? Are there other types of thermometers, other than mercury, that can be used when taking the temperature of cattle?

LOOKING AT MEDICINE

Medicine can be given through the mouth (orally) or with a needle (by injection). Whichever way you give the medicine, be sure to read the directions on the box or bottle. Follow instructions carefully for the amounts and ways to give it.

The amount of medicine you give an animal often depends on how big the animal is. It is important to give your calf the right amount. Giving it more will not make it get better faster. It may make it sicker.

Reach Out!

Invite a veterinarian to your meeting to discuss Herd Health Plans and detecting and treating sick animals.

Oral Medications

Medicines given through the mouth work more slowly than those which are injected. That's because the medicines must go through the digestive tract before they can be absorbed into the bloodstream, where they go to work.

IN THE FEED:

- Powder: Mix the drug well into the feed. These drugs must taste good or the animal won't eat. The animal won't get the medicine and may become sicker.

BALLING GUN:

- Capsule
- Tablet
- Bolus

Put the balling gun in the animal's mouth at the back near the throat. Press the plunger to force the capsule, tablet or bolus down the animal's throat.

DRENCHING BOTTLE

- Liquid: Put the bottle in the animal's mouth at the back near the throat. Give the liquid slowly to make sure the animal swallows and the liquid goes down the esophagus and not into the lungs.

FLEXIBLE TUBE OR HOSE

- Liquid: Slide the tube or hose into the animal's mouth and down the throat to the stomach. This can be used to put medicine directly into the rumen. It can also be used to relieve pressure in animals with bloat.

Injections

Medications may also be injected or given with a needle.

SUBCUTANEOUS:

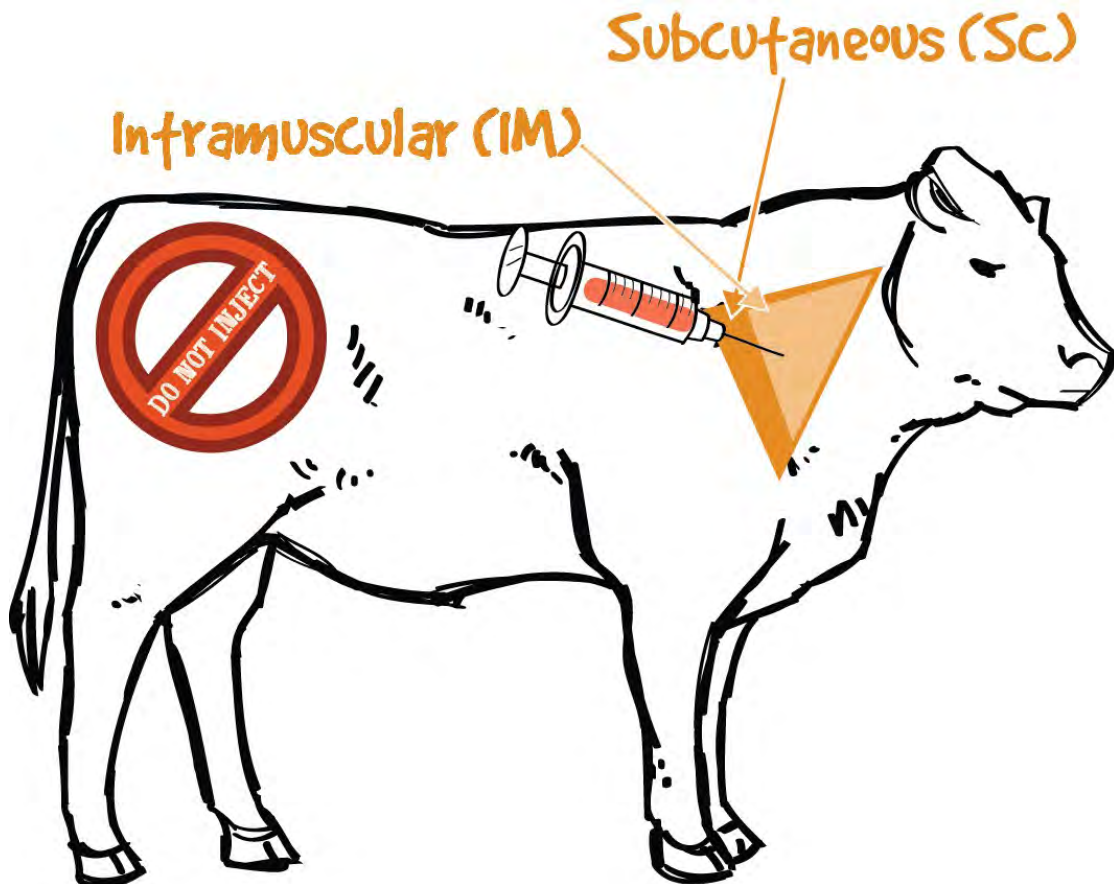
- Injected beneath the skin
- The best place to inject is just in front of the shoulder where the skin is loose. If the dosage is large, split it in half and give it in two locations. Some medications cannot be injected subcutaneously because they will bother the animal.

INTRAMUSCULAR:

- Injected directly into the muscle: Inject directly into the muscle to get drugs into the animal quickly. The two recommended sites are the hind leg and the neck and the front shoulders. This is to prevent muscle damage to the prime cuts of beef. Do not inject into a large blood vessel. It could kill the animal. If the dosage is large, split it in half and give it in two locations.

INTRAVENOUS:

- Injected into the vein: An intravenous injection should be done by a veterinarian or someone with experience. Use it if:
 - » the dosage is very large
 - » medication must get into the bloodstream immediately
 - » medication is too irritating to be given to animal any other way



Credit: 4-H Alberta Beef Project

- When giving injections, always:
 - » use sterile equipment
 - » make sure the injection area is clean
 - » read the label on the medication and follow the directions
 - » restrain your animal in a squeeze chute with a head gate
 - » consult your veterinarian if you are not sure

VACCINATION PROGRAM

Vaccination is the administration of a vaccine to increase immunity, or in other words, strengthen the ability to fight-off illness or disease. A vaccination program is a really important part of a Herd Health Plan.

Producers and their veterinarians discuss what they're going to vaccinate the herd against. They look at what was an issue last year and anticipate what may be an issue this year. They will also review the proper handling, storage and administration techniques and protocols for the vaccines that they've chosen. These factors, along with the timing of vaccination, can have a huge impact on how effective your vaccination program is.

When it comes to vaccinating your herd, timing can be everything. It's important that the herd's vaccination schedule is in sync with the overall production and management cycle. A veterinarian that is familiar with the herd can help producers to time vaccinations correctly to maximize the benefit in terms of disease prevention and cost effectiveness.

Remember to have a vaccination plan in place ahead of time, use proper cleaning, sanitation and disposal practices, always follow the manufacturer's directions and consult your local veterinarian if you have any questions or concerns when it comes to your vaccination program.

VACCINATIONS

Vaccines are typically injected subcutaneously (beneath the skin) or intramuscularly (directly into the muscle). It is recommended that producers use vaccines that can be injected using the subcutaneous (also called subQ) method whenever possible. They should be injected under the loose skin of the neck, in front of the shoulder. If a vaccine must be given intramuscularly, inject it into the muscles of the neck, also in front of the shoulder. Never inject in the hip or thigh.

When we vaccinate, we deliberately introduce infectious organisms into the body of the animal. By doing this, we hope that the animal will produce antibodies. Antibodies help the animal fight the disease and become immune to it. If the animal ever comes into contact with the disease, it will be protected against it.

Discuss It!

Some vaccines will vaccinate against multiple diseases. Find out what the most commonly used vaccine is that used in your area and what diseases it protects against.

There are two types of vaccines:

1. Live

Live vaccines contain live disease causing organisms. These organisms have usually been modified in some way so they cannot actually produce the disease.

2. Killed

These vaccines contain dead organisms, such as bacteria, which have been added to a liquid carrier.

Always follow the directions for vaccinating. Before using any vaccine, read the label carefully. Check for:

- dosage or amount to give
- way to give the vaccine (subcutaneous or intramuscular)
- expiration date

Handle vaccines with care. Store them under refrigeration, but not frozen. Keep them out of the sunlight. Sometimes cattle are allergic to the vaccines we give them. Signs of allergies will usually appear within an hour of vaccination. Watch for some or all of these symptoms of an allergic reaction:

- difficulty breathing
- staggering
- swollen eyes
- bloat
- swelling of the vulva

If you see any of these signs, call your veterinarian.

HERD HEALTH AND MANAGEMENT CALENDAR

A complete herd health program can make your cattle healthier, more efficient and more productive. A preventative herd health program, such as the one below, that focuses on disease and management problems which can cause economic losses would be effective.

PRECALVING AND CALVING SEASON (Early Spring):

- Identify cows with vaginal prolapses for culling.
- Watch for abortions and send aborted fetuses for examination.
- Check for lice and treat infestations.
- With your veterinarian, discuss vaccinating the cow herd for scours.

- Keep calving areas clean, dry and well bedded.
- Prepare for calving and calving problems.
- Have electrolytes and antibiotics ready for treating scours.
- Inject calves with vitamin E and selenium and/or vitamins A, D and E if necessary.
- Watch for calf scours and pneumonia.
- Identify calves and record birth dates and calf weights immediately.
- Re-assess nutrient requirements and performance of heifers and cows and make necessary changes.

BREEDING SEASON (Late Spring And Early Summer):

- Check daily for scours and pneumonia in calves.
- Evaluate fertility of all breeding bulls:
 - » semen quality
 - » physical examination
 - » libido
- Have all breeding females with previous problems examined by your veterinarian.
- Make sure you have an adequate bull to female ratio.
- Prepare teaser animals if using AI.
- 30 days before breeding, vaccinate all replacement heifers for IBR, BVD and vibriosis if necessary.
- Two weeks before breeding, vaccinate cows for vibriosis if necessary.
- Vaccinate all calves over two months of age for blackleg, and other clostridial diseases.
- Castrate, dehorn and implant calves.

PREWEANING AND WEANING (Fall):

- Prepare calves for weaning and preconditioning.
- Pregnancy test all cows and cull non-pregnant and unhealthy cows.
- Treat for warbles and external parasites.
- Wean calves with as little stress as possible.
- Watch calves for pneumonia and treat immediately.
- Weigh calves and record weaning weights.
- Make your initial heifer and bull replacement selections.

- Evaluate performance of the breeding herd by calculating:
 - » percentage calf crop
 - » weaning weights
 - » death loss percentage
 - » cost per pound of calf marketed
- Vaccinate replacement heifer for BVD about three weeks after weaning.

WINTERING PERIOD:

- Take inventory of feeds available and have feeds analyzed.
- Work out rations for different classes:
 - » pregnant heifers
 - » pregnant cows
 - » heifer replacements
 - » bull replacements
 - » breeding bulls
 - » feeder calves
- Initial vaccinations for calf scours may be given in the fall instead of mid-winter.
- Check cows daily for signs of heat and external parasites.
- Watch for abortions and send fetuses for examination.
- Increase your knowledge of the beef business through:
 - » research and extension publications
 - » extension meetings
 - » farm press
 - » commercial firms and consultants
 - » nutrition and managements programs
 - » online courses

Check It Out!

Make sure to look at the Code of Practice for the Care and Handling of Beef Cattle before castrating and dehorning. You can find it at: <http://www.nfacc.ca/codes-of-practice>

BIOSECURITY

Biosecurity practices help to prevent and reduce the introduction and spread of illness or disease amongst animals. Isolating sick animals from the rest of the herd while following proper cleaning, sanitation and disposal procedures for equipment and facilities are just a few things producers can do to prevent the spread. The same goes for when you're introducing outside animals to your herd! Take the necessary precautions and quarantine new animals for at least

three weeks so that you can monitor them for illness or disease before introducing them to the rest of the herd.

Signage on barns (e.g. no admittance) is also a good idea to be able to control the flow of people (and possible diseases) into the barn.

RABIES

<https://www.ontario.ca/page/rabies-livestock>

Rabies is a virus that can be transmitted, through saliva, from an infected mammal to any other mammal, including livestock, pets, wildlife and humans.

Rabies is almost always fatal and an animal will typically die within a few days after signs of rabies appear.

How do Livestock get Rabies?

Livestock can get rabies if they:

- are bitten by a rabid animal
- get saliva from an infected animal, dead or alive, in an open cut, sore or wound
- get saliva from an infected animal, dead or alive, in its eyes, mouth or nose

Even a frozen carcass can contain live rabies virus.

Cases of rabies in livestock in Ontario are most commonly reported in bovines (cows, bison and oxen). The last confirmed case of rabies in a bovine was in 2017.

Livestock that aren't mammals, including fish and poultry, can't get rabies.

Symptoms of Rabies

The signs of rabies in livestock can include:

- behaviour change, either:
 - » very aggressive or
 - » dull and depressed
- making strange noises (caused by spasms in the vocal chords)
- weakness in the hindquarters

Rabies can't be treated in livestock. Once signs of rabies appear, the animal will die.

Discuss It!

There are many ways to gather information but you have to make sure you are getting information from reliable sources. What do you feel are the best places for credible information about the beef industry? What sources of information should be avoided?

If you suspect that your farm animal may have rabies or see a wild animal on your property that you suspect may have rabies:

- keep it away from other livestock, pets and humans
- try to isolate it in a quiet area
- call your local veterinarian

New laws in Ontario are pending for the vaccination of livestock against rabies. Visit <https://www.ontario.ca/laws/regulation/900567> for up-to-date regulations.

For more information about rabies visit: <https://www.ontario.ca/page/rabies-livestock>.

RINGWORM

Ringworm is one of the most common skin diseases in such cattle. Ringworm (dermatophytosis) is a skin disease caused by fungi found throughout the world. Ringworm is a zoonotic disease that can affect humans and all animals, but most commonly cats and cattle.

How is it transmitted?

- Direct contact with an infected animal or human fungal lesion.
- Indirect contact from surfaces (blankets, grooming equipment, posts, feed bunks) where animal or human lesions may have rubbed against.

Symptoms:

- Grey-white areas of skin with an ash like surface
- Usually circular in outline and slightly raised
- Size of lesions extremely variable, can become very extensive
- In calves most commonly found around eyes, on ears and on back, in adult cattle more commonly found on chest and legs

Treatment:

- Ringworm will usually heal itself without treatment however this can take up to nine months.
- Topical treatment, application of the medication directly onto the lesion is the usual procedure. Medication cannot penetrate the crusts; the crusts should be removed by scraping or brushing. They should be collected and burned to avoid contaminating the premises. Lesions should be treated at least twice, three to five days apart.

Look It Up!

If you have to get your farm animals vaccinated for rabies, find out from your veterinarian what the cost of the rabies vaccination is, who can administer it, if there is a withdrawal time, what kind of paperwork comes with the vaccination and any other required information in order to meet the provincial laws.

Prevention:

- The environment is a major source of infective fungi. Effective control of ringworm will only occur if the environment is properly cleaned and disinfected. This must be done between each batch of animals.



Ringworm

Credit: Colorado State University <http://coloradodisasterhelp.colostate.edu/prefair/disease/dz/Ringworm.html>

- Vaccination is available in some countries.
- Reducing the density of animals and direct contact in addition to increased exposure to sunlight and being maintained on dry lots help prevent the spread between animals.

Animals with ringworm should not be taken to shows or public events where it can be spread from animal to animal and also animal to human.

Share it!

Have you been to a show where there was an animal with ringworm? Was anything done about it?

Why is it important to keep an animal at home that has ringworm?

RECORD KEEPING

Good record keeping is the glue that keeps a producer's Herd Health Plan together. Using an electronic or paper system, producers should keep up to date records on each individual animal in their herd.

When it comes to keeping track of the health of your herd, a note should be made any time a health abnormality or injury is observed, a vaccination, diagnosis, treatment or medication



Credit: 4-H Alberta (page 66)

is given, or when an animal has to be re-tagged. When new animals are introduced to the herd, their health record should be added to your herd health records as well.

Veterinarians find accurate and complete herd health records to be extremely useful when it comes to diagnosing an animal or analyzing how effective the Herd Health Plan was, so that necessary improvements can be made for next year. Remember, a healthy herd is a productive herd!

Reach Out!

Invite a beef farmer to your meeting (or tour their farm) and ask what they use to keep records of their herd. Find out if they have had to share the information with their veterinarian and if it was helpful.

Check It Out!

Are there any laws in your area that state a protocol for how animal health records must be kept? What type of records must be kept? (i.e. medication, disposal of sharps, disposal of expired medications)

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about beef herd health through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

Create a Herd Health Plan for your farm or a fictitious beef farm if you don't live on a farm. Or, if your farm already has a Herd Health Plan in place, review the plan to make sure it covers the various topics covered in this meeting.

DIGGING DEEPER FOR SENIOR MEMBERS

Measuring the heartbeat of an animal can be a little more difficult than a human. Research the best method for measuring the heart beat in cattle and be prepared to demonstrate this at a meeting for the rest of your club.

UNIT 4B: PARASITES

SETTING OBJECTIVES:

Not only can parasites cause economic loss, a parasitic infestation in a beef animal can cause many health concerns and affect the well-being of the animal. Members need to be able to identify animals that may be suffering from a parasitic infestation and know what to do to help the animals.

Suggested Lesson Outcomes

- To understand what a parasite is
- To be able to identify what an animal looks like that might be suffering from a parasite infestation
- To understand the life cycle of parasite so as to better prevent and/or treat the parasitic infestation

ROLL CALLS

- Name a parasite that can affect a beef animal.
- What is one symptom that an animal has a parasite infestation?
- Name one method of parasite treatment.

SAMPLE MEETING AGENDA Time: 1 hour 40 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information What are Parasites? Parasites and Your Beef Animal Controlling Parasite Infection Internal and External Parasites	60 min + Activities
At Home Activity	Parasitic Treatments	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

WHAT ARE PARASITES?

A parasite is any living organism which survives on or in a host animal. This organism, or parasite, gets all of its support for life from the host animal. This includes its food and shelter. There are two types of parasites.

- An internal parasite
- An external parasite

PARASITES AND YOUR BEEF ANIMALS

Why do we need to worry about parasites?

Parasites harm our animals. They cause our beef cattle to be stressed. When they are stressed, they don't perform well and they are more susceptible to disease and infection.

The healthy beef animal:

- has bright, clear eyes
- eats regularly
- drinks water provided
- is active
- has a shiny hair coat
- has pleasant breath

Look It Up!

Find some examples of internal and external parasites.

A beef animal with internal parasites may:

- stop drinking
- have poor feed efficiency/decreased appetite
- be weak and losing weight
- have decreased milk production
- be generally unhealthy
- become anemic
- have poor hair growth

A beef animal with external parasites may:

- be uncomfortable
- not eat or drink regularly

- lose weight
- have a rough and dull hair coat
- rub against fences, walls or trees

The bottom line is that your beef animal will not be healthy. When they are not healthy, they will not grow or produce well. When they do not grow or produce well, this costs you money.

It is important to know that a beef animal with only a slight infection of parasites will look normal. Often, you cannot tell just by looking at the animal that there is a problem. A beef animal with a severe infection or many parasites will look sick.

CONTROLLING PARASITE INFECTION

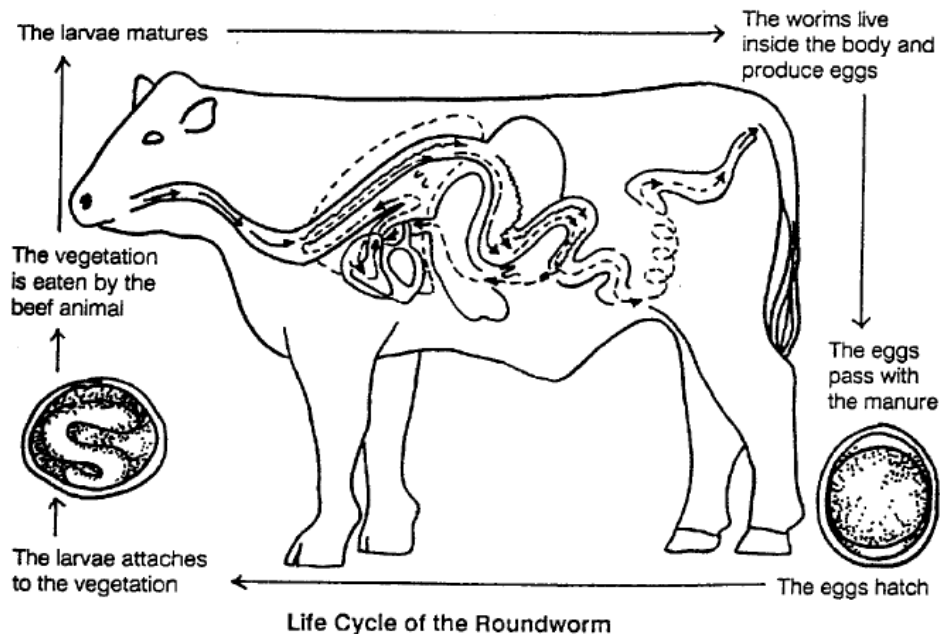
It is much easier and less expensive to control parasites by preventing them, rather than having to treat your animals once they have parasites. Because beef cattle spend a lot of time on pasture, they are very susceptible to parasites, especially worms.

To better understand how a beef animal can become infected, look at the life cycle of a common internal parasite, the roundworm.

Life Cycle of the Roundworm

Suppose your beef animal has roundworms. The worms lay eggs while live inside the body.

These eggs pass out of the body in the manure. While on the ground in the manure, the eggs grow into larvae. These larvae move from the manure to the grass. The animals eat the grass, taking the larvae into their body. Once inside the body, the larvae grow into adult worms. The cycle continues.



Credit: B.C. 4-H Beef Member Manual

In Canada, roundworms can be found in beef and dairy cattle year round, particularly in young animals. They are often found in only small numbers. Because of this, it is often difficult to detect them.

There are three different species of roundworms which can live in the abomasum or fourth stomach of cattle:

ROUNDWORM	LENGTH
Barberpole worm	35mm
Brown stomach worm	15mm
Threadworm	7mm

Roundworms suck blood while attached to the stomach wall. One or all three of these species may be found. A serious infection would include several thousand of these worms in one animal.

The threadnecked worm is a common roundworm found in the small intestine. It causes harm only when found in large numbers.

How can your animal become infected with parasites?

The first step in preventing roundworm infection in your cattle is to know how to recognize infected cattle. Roundworm infection is usually a herd problem rather than an individual animal problem. If only a few worms are present, you likely won't notice any problems.

When many worms are present, your animals will begin to lose their appetites, not gain weight, appear thin and look poorly. Some may develop scours. To be positive that worms are the problem, manure samples can be analyzed for the identification and count of eggs.

This will tell which type of worm and how severe the problem is.

There are several treatments on the market. Whether or not mass treatment is necessary is an individual farm decision. Consult your veterinarian for more information.

OTHER COMMON INTERNAL PARASITES

Coccidiosis

Coccidiosis (cox-sid-dee-oh-siss) is a common disease of cattle caused by a protozoa. It develops most often when weaned calves aged six to twelve months are crowded together. Calves often become infected in the winter months when placed in groups in barns or other areas contaminated by older cattle or other infected calves.

Check It Out!

Find out what treatments are available in your area for roundworm infestations in cattle, how the treatment is administered and how much treatment an animal should receive.

Research It!

What is a protozoa?
How does the protozoa manifest itself to cause coccidiosis in cattle?

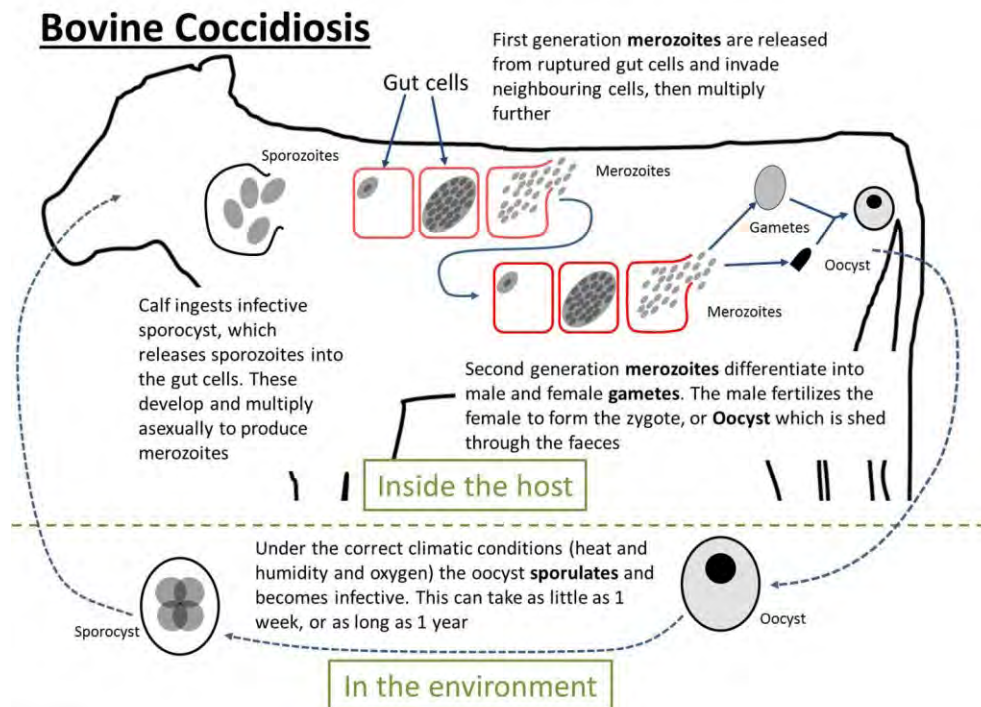
Coccidiosis has both internal and external stages. A microscopic egg called an oocyst is passed out in the manure of animals with coccidiosis. With ideal temperature, moisture and oxygen conditions, the oocyst matures and develops eight bodies called sporozoite. Each of these is able to enter a cell in the animal's intestine after being eaten.

When the sporozoite enter the cells, they divide many times, moving into and damaging intestinal cells. When the male cell fertilizes the female cell, an oocyst is produced. This oocyst ruptures the cell and passes out of the animal in the manure.

The first sign of coccidiosis is diarrhea, which may be just watery or containing blood. Dehydration, weight loss, depression and loss of appetite may occur. When severe, death will result. Older cattle who recover from coccidiosis may be

Discuss It!

Some feedlots will treat the water going into drinking water systems for cattle. Do some investigating to see if any feedlots in your area do this. Find out what types of treatment can be used for feedlot water systems.



Credit: Farm Health Online <http://www.farmhealthonline.com>

immune but will continue to pass oocyst in their manure, infecting other animals.

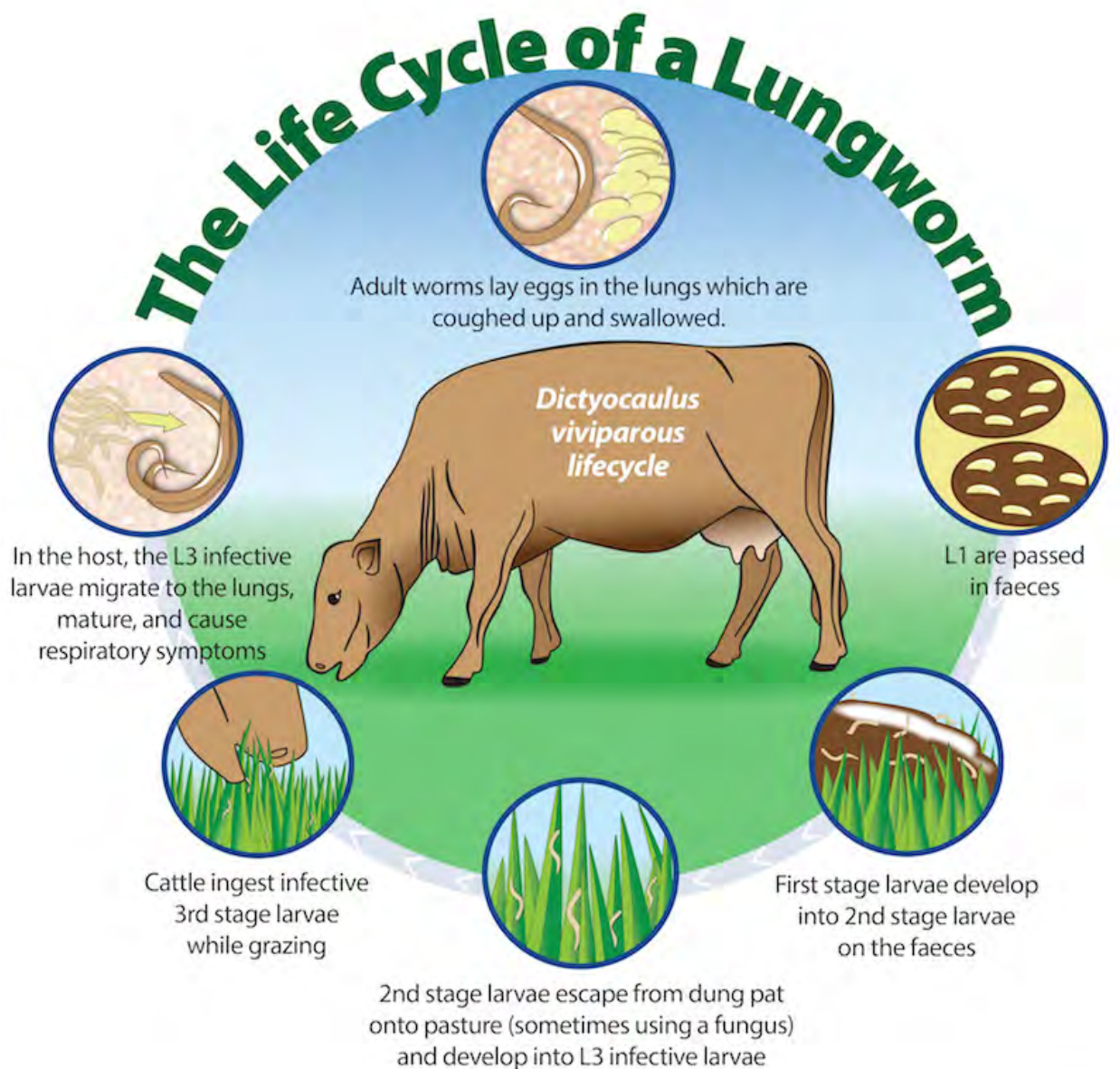
Prevent coccidiosis in your herd by making sure feedlot drinking water and feed cannot be contaminated with manure. Don't feed cattle on the ground. Keep the pens dry and well bedded and isolate infected animals.

Lungworms

Bovine parasitic bronchitis or lungworm disease is caused by another roundworm. Heavily infected calves will have difficulty breathing and may die. The irritation caused by the lungworms causes the lungs to produce large quantities of mucus. This mucus becomes foamy and blocks the air passages when the calf tries to breathe. The adult worms can actually block the air passages themselves. Other symptoms include coughing, rough hair coats and lower weight gains.

The adult worms are white, thread-like and about 10 cm long. They live in the trachea and bronchi, the air passages leading to the lungs. In heavily infected animals, there may be hundreds of worms. The adult females lay eggs which hatch in the lungs, releasing tiny worm-like larvae. These larvae are coughed up and swallowed, then carried through the intestine and out of the animal in the manure.

In three to seven days, the larvae mature pass through several stages until they can contaminate pasture, water and feed. Once swallowed, the larvae move through the wall of the intestine and are carried to the lungs in the blood. Once they reach the lungs, they leave the blood and develop into adults in approximately seven days. These adults can live in the lungs for 50 to 70 days.

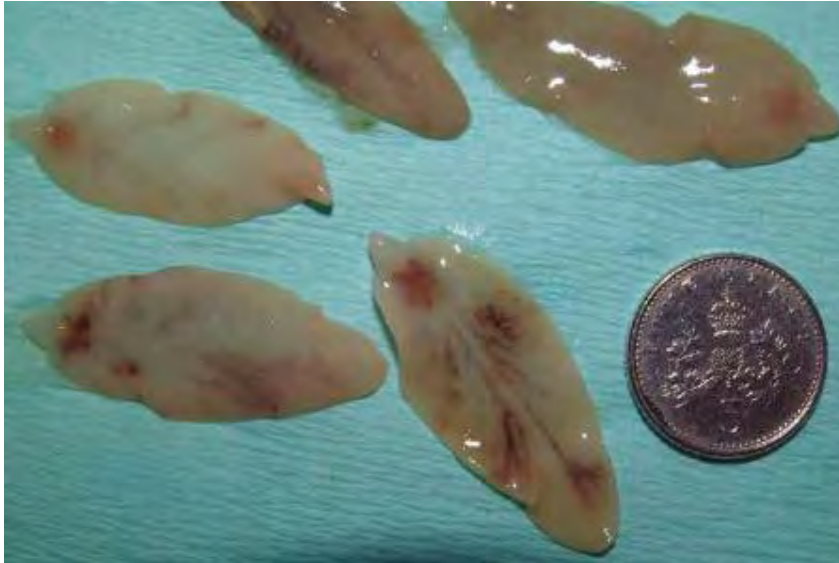


Credit: Bimeda Canada <https://www.bimectin.com/disease-information-cdn/cattle/lungworms>

Liver Flukes

Liver flukes are found in cattle inhabiting low lying areas where fresh water snails can be found. Cattle with liver flukes have lower weight gains, decreased milk production and poor feed efficiency. However, they are difficult to identify before the animal is slaughtered.

The adult liver fluke is about 2.5 cm long and 1cm wide, and lives in the bile ducts of cattle livers. The female lays eggs which pass in the manure. The eggs hatch and the flukes move into the snail. Four to seven weeks later, larvae leave the snail and attach to the grass. Cattle eat the grass, taking in the larvae. The larvae burrow through the intestine and move to the liver. The life cycle takes four to six months, but flukes can live up to eleven years.



Check It Out!

Find out if your veterinarian carries a product to treat for liver flukes, how much it costs, how it is administered and if it has to be administered once or several times.

Common Liver Fluke

Credit: <https://reproductive17.weebly.com/common-liver-fluke.html>

Eyeworms

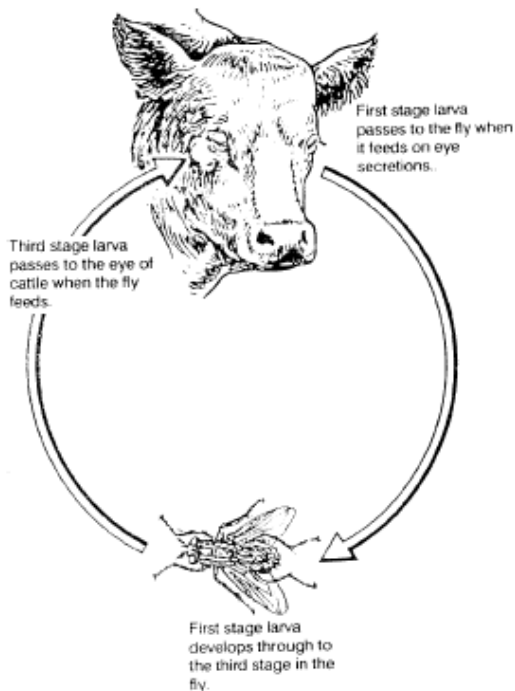
Eyeworms are found most often in two to seven year old animals. Two hosts are needed to complete the life cycle - flies and the eyes of cattle.

Adult worms develop in the eyes and the lacrimal, or tear ducts, of cattle. Female worms produce eggs. These eggs hatch releasing first stage larvae which move into the tears. Face flies become infected with these larvae when they feed on the tears. These larvae enter the gut of the fly and develop into a second, then third stage larvae. The larvae move to the cattle from the fly, when the fly feeds on the tears.

Disease of the eye may occur. It begins with a mild inflammation of the inner eye membrane.

Look It Up!

Search on the Internet for pictures of cattle eyes infected with eyeworms. Then search for what the treatment is to treat the infestation.



Credit: B.C. 4-H Beef Members Manual

The cornea becomes cloudy and the animal produces lots of tears. When very severe, the infected eye may become swollen and covered with pus.

Infections are found most often in the summer months. Positive diagnosis is made by examining tears under the microscope and finding the first stage larvae.

EXTERNAL PARASITES

Animals infected with external parasites may show some of the following symptoms:

- uncomfortable
- scratching or rubbing on fences or walls
- greasy, dirty, rough hair coat
- irritable
- difficult to handle

Lice

There are two types of lice - sucking and biting. Sucking lice are slate blue in colour and feed on the blood of the animal. There are two types of sucking lice:

- short-nosed cattle louse
- long-nosed cattle louse

They are usually attached with their heads partly buried in the skin. The adult female is about 3 mm long. The eggs or nits are cream coloured and are attached to the hairs near the skin. Biting lice feed on the hair, loose and dead skin and other debris on the skin of the animal. The biting louse is about 1.5 mm long and has a red head and light cream or yellowish body.

Eggs of the sucking lice hatch 11 to 20 days after they are laid. Young lice mature within seven to 14 days. Biting lice eggs hatch and mature more quickly. The total life cycle of biting lice is about 15 to 22 days, compared to 18 to 34 days for the sucking lice. Cattle lice must remain on the animal continuously to feed and can survive for only one to two days if removed from the animal.



Lice

Credit: NCSU Extension

Control of lice in your herd is economically important. Infested cattle have a poor appearance and a reduced market value. Heavy uncontrolled infestations may lead to an increase in abortions and reduce the birth weights and weaning weights of calves. In breeding bulls, heavy infestations can cause reduced success in breeding.

It is important to control lice. Your objective should be to keep a louse-free herd through regular inspection and quarantine practices. Follow these practices to reduce and eliminate lice in your herd:

1. Keep pens, stalls, feed lots and barn yards clean and dry.
2. Thoroughly clean and disinfect areas which have been used for confining lousy cattle.
3. Inspect all cattle in late spring. Isolate, delouse and re-inspect lousy animals before returning them to the herd.
4. Inspect cattle in early fall before they are moved to winter range or confined. If you find infections, treat all animals immediately to avoid later infections.
5. If possible keep animals new to your herd in isolation for four weeks to ensure you are not bringing new infestations into your herd.

Check It Out!

There is more than one type of treatment on the market for de-licing cattle. Compare prices and effectiveness and decide which one would work best for your cattle if you needed to use a product on your herd.

Mange

Mange is caused by tiny mites that feed on animals. There are three types of mange which affect cattle in Canada:

- **Demodectic mange** is the least serious type of mange.
- **Chorioptic mange** is most common. It is caused by mites that live on the surface of the skin.
- **Sarcoptic** mange or barn itch can be very damaging to your cattle.

Mange is confirmed only by examinations of skin scrapings by microscope. The mites are very tiny, as small as 250 micrometres in length. You should suspect mange if your cattle are uncomfortable and constantly rubbing on posts, fences or trees and have scabs developing on rough hair coats. Contact your veterinarian if you suspect mange.

Infection of mange occurs by direct contact. Grooming tools and bedding can also transfer



Sarcoptic Mange (Scabies)
Credit: MSD Veterinary Manual

the mites. Make sure you disinfect your tools and clean and disinfect the housing area of animals infected with mange.

There are many products available to treat parasites that cause mange. Treat your infected animals only after consulting with your veterinarian.

WARBLE FLIES

Warble flies are a pest of cattle. They create losses due to reduced weight gain and milk production caused by cattle grub movement through the animal's body. Meat and hides are also damaged by the grubs.

The Life Cycle

In the spring, the grubs drop from the cattle. The grubs develop into warble flies, which look like bumblebees. The flies are active on sunny days, and do not bite, sting or chase cattle in the shade or water. The female fly lays tiny eggs on the lower part of the animals' body. Cattle react to this egg laying by running with their tails in the air. Each female adult fly can lay as many as 400 to 800 eggs.

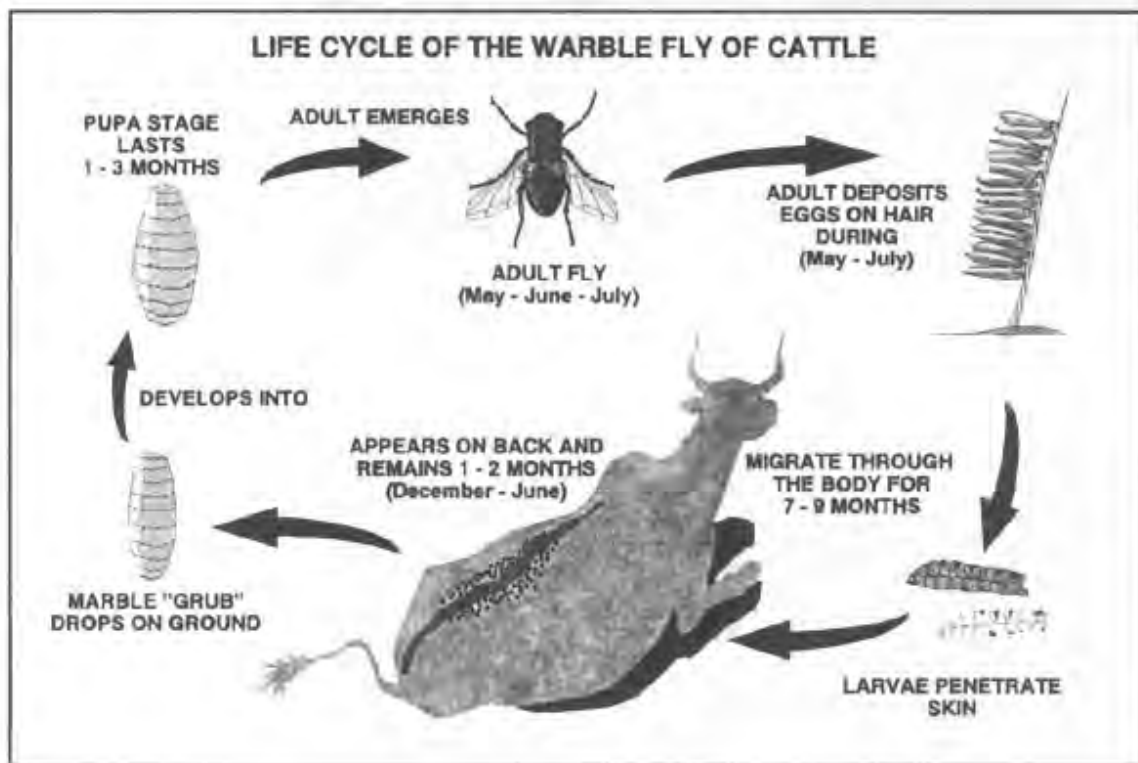
In two to seven days, tiny larvae hatch from the eggs. They crawl to the base of the hair where they burrow through the skin into the animal's system. The larvae move through the body tissue during the fall and the winter, reaching the back of the animal in the spring, March or April. They cut holes for breathing through the hide and remain there for four to ten weeks.

The grubs crawl out of the hole, fall to the ground and develop into a pupa during April, May or June. In one to three months, the adult flies come out of the pupa. They begin laying their eggs from late April through September.

There are two species of warble flies in Canada - the common and the northern. The common lays groups of eggs on the lower part of the animal's body. The northern cattle grub adults, also called heel or gad flies, dart at the animals, attaching single, tiny eggs on the legs above the hooves. While moving through the animals, the common grub moves into the esophagus. The northern grub gathers around the spinal cord.

Judge It!

Judge grooming tools based on which tool is most likely to spread mange and/or which tools are the easiest to clean to prevent the spread of mange.



Credit: Protect Health.....Protect Life

Controlling Warble Flies

Systemic and contact insecticides are available for grub control. Systemic insecticides are absorbed into the animal's bloodstream when applied to the skin, killing grubs wherever they are in the animal. Contact insecticides must come in direct contact with the grubs. They must be scrubbed or sprayed into the warble opening in the hide during the spring.

Fall is the best time to treat since grubs are killed before they cause major damage. Spring treatment is considered to be the clean-up treatment.

It is the responsibility of every livestock producer to control warbles and their larvae. This is for the farmer's own benefit as well as the benefit of his or her neighbours and the livestock industry.

Research It!

Farmers are advised not to treat for warbles during the winter months. Find out why this is.

HORN FLIES

The horn fly is a small, irritating, blood-sucking fly that reduces the productivity of cattle, particularly those in pastures. The horn fly usually rests on the withers, back or underline of cattle, those areas that cannot be reached by the tail or the head. It is attracted to dark colours.

Horn flies feed on adult cattle and are not attracted to calves under four or five months of age. Both female and male flies bite and feed on cattle. Fly bites develop into sores as the flies feed around the edges of previous bites. Scabs develop.

The Life Cycle

The female lands for about 10 minutes at a time to lay eggs under the edges of fresh cattle droppings. Within 24 hours, the eggs hatch and larvae crawl under the droppings. Four to ten days later, pupae develop. Five to 13 days later new adults emerge.

As many as four generations of horn flies may be produced in a season with peak activity occurring in July and August. Mature larvae and pupae will overwinter in the manure.

Losses caused by horn flies include lower milk production, lower weaning weights and lower weight gains. Horn fly infestation is also associated with the incidence of pinkeye disease in cattle.

METHODS OF PARASITE CONTROL

There are several general methods of controlling parasites on your farm. These involve management. Some of these are:

1. Keep your barn and corral areas clean and dry.
2. Don't overcrowd your animals.
3. Feed in clean feeders. Avoid feeding on the ground.
4. Use well drained pastures.
5. Don't allow your animals to wander in low lying areas.
6. Isolate new animals to the herd for at least three weeks.
7. Rotate your pastures.
8. Keep your water supplies fresh and clean.
9. Know how to identify parasites and pests in your herd.
10. Learn how to control and eliminate parasites and pests.



Horn Fly

Credit: University of California Veterinary Entomology http://veterinaryentomology.ucr.edu/horn_fly.html

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

Visit your local farm supply store and/or veterinary clinic and make a list of the treatments available for over-the-counter purchase for parasitic infestations. Find out if the veterinary clinic has treatments that require a prescription and/or a veterinarian to administer the treatment.

DIGGING DEEPER I FOR SENIOR MEMBERS

Any parasitic infestation in cattle causes economic losses. Choose one of the parasites discussed in this meeting and investigate the cost of treatment for the infestation as well as the cost if the infestation is not treated.

DIGGING DEEPER II FOR SENIOR MEMBERS

There are parasitic infestations of animals that can be transmitted to humans. Make a list of these parasites.

UNIT 4C: DISEASES OF THE BEEF ANIMAL

SETTING OBJECTIVES:

When not monitored closely, disease can have a devastating effect on a farm. There are many diseases to watch for on a beef farm. Learning preventative techniques as well as early detection of disease can greatly benefit not only the farmer but also the animals as well.

Suggested Lesson Outcomes

- To have a good understanding of why monitoring for disease in beef cattle is so important
- To be able to identify various diseases that beef cattle can suffer from
- To learn about disease prevention
- To learn about various treatments available

ROLL CALLS

- Name one disease that can affect beef animals.
- Why does a beef farmer need to have a good working relationship with their veterinarian?
- Have you seen a beef animal afflicted with a disease and if so, what was the treatment?

SAMPLE MEETING AGENDA Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information General Diseases Diseases of Feedlot Cattle	40 min + Activities
At Home Activity	Hoof Health	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

When not monitored closely, disease can have a devastating effect on a farm. There are many diseases to watch for. The following list outlines some common diseases found on beef farms in Ontario. However, it is not a complete list as new diseases and variations of existing diseases can emerge. It is always a good idea to stay informed of new diseases affecting animals in your area and to have a good relationship with your veterinarian.

GENERAL DISEASES

SCOURS

Scours is the second leading cause of calf deaths. You will recognize scours by the thin, watery manure and the manure stained hind quarters of the animal. Calf scours usually occur in the first month of life.

Causes:

- bacteria
- virus
- protozoa

A calf becomes more susceptible when stressed with:

- sudden changes in diet
- nutritional deficiencies
- wet or environment
- overcrowding
- poor weather

Symptoms:

- diarrhea
- dehydration
- fever
- weak and depressed
- no appetite

Calves with scours can die quickly. If you find scours in your herd:

1. Isolate the sick calves.
2. Avoid carrying infection from sick to healthy calves. Wash pails and equipment. Change your coveralls and wash your boots.
3. Feed electrolytes. These will help to rehydrate your calf and replace the fluids and minerals lost.
4. Consult your veterinarian as soon as possible.

Good management is the first step to preventing calf scours.

1. Start your scour prevention before the calf is born. Make sure your pregnant cows get proper treatment.
2. Crowding causes stress on cows and calves and increases the contamination on the ground. Provide 65 square metres of calving space per cow.
3. Disease resistance of heifers is not as good as that of cows. Winter your cows and heifers separately to avoid exposing heifers.
4. Avoid overfeeding or underfeeding calves. Make your changes to the diet gradually.

Research it!

What ingredients are in electrolytes that make it effective to treat scours?
What do these ingredients do within the calf's body?

BLOAT

Bloat occurs when gas is produced in the rumen faster than the animal can get rid of it.

There are two types of bloat:

1. FREE GAS BLOAT - gas collects in the upper part of the rumen.
2. FROTHY BLOAT - gas is trapped in foam in the rumen.

Causes of Free Gas Bloat:

- some functional defect prevents the animal from burping to get rid of gas
- hardware, liver abscesses, tumours or obstructions

Causes of Frothy Bloat:

- caused by the diet
- fermentation occurs too quickly causing gas to be trapped as foam
- grazing legume forages, finely chopped roughages or finely ground grain

Symptoms of Bloat:

- swelling on left side of abdomen
- uneasy and anxious
- shallow grunting
- uncomfortable
- rapid breathing
- urinates often
- passes manure

An animal with bloat may die very quickly. It is important to relieve the pressure as soon as possible. You can do this by:

- walking the animal
- drenching with mineral oil
- using a stomach tube to allow gas to escape
- puncture the rumen and use a trocar

You can prevent bloat:

1. Change feeds very slowly.
2. Don't feed finely ground grains. Fine particles ferment more quickly than larger particle.
3. Rotate your pasture for better feed used and feed quality. Avoid pastures with young legumes.
4. When you first put your cattle out on pasture, feed them hay first. They will be less hungry and less likely to graze too much.

Check It Out!

Have a trocar (trow-kar) at your meeting. Have a 4-H leader, veterinarian or beef farmer explain how it works. Examine the trocar up close.

NAVEL ILL (also called JOINT ILL)

Immediately after birth, the navel of the calf is an open wound. It is tender and susceptible to disease and bacteria.

Cause:

- bacteria entering the calf through the navel

Symptoms:

- navel will be hot and swollen
- fever

- depressed
- may quit nursing

Once the bacteria enters the body, the infection may spread quickly, causing painful, swollen joints. The calf may not want to stand up.

Treatment:

Early treatment is necessary to prevent the infection from spreading. Infected animals should be separated and treated with antibiotics and pain medication. Antibiotic treatment should continue until after the signs have disappeared (which can take over a week even in mild cases), although severe cases may not recover even with prolonged antibiotic treatment.

PNEUMONIA

Several viruses may be involved in an outbreak of viral pneumonia in calves. Complications caused by the bacteria are common.

Causes:

- bacteria or virus

Your calf becomes susceptible when stressed:

- cold or wet bedding
- over-crowding
- changes in feed
- castration
- dehorning
- branding
- parasites
- rapid weather changes

Symptoms:

- fever
- rapid breathing
- cough
- runny eyes and/or nose

Share It!

Share best practices within the group for preventing navel ill. Find out what has worked well for beef farmers and what hasn't worked so well. If no one in the group has had experience with navel ill, research to find the best prevention techniques.

- no appetite
- droopy ears
- listless

Good management is important in controlling viral pneumonia. Avoid over-crowding, provide adequate shelter and good nutrition. Make sure that newborn calves receive enough colostrum. They should have at least two litres in the first two hours of life and two more litres in the next six to eight hours.

DISEASES OF FEEDLOT CATTLE

Cattle placed in feedlots are susceptible to many diseases. Some common diseases of feedlot cattle are:

FOOT ROT

Cause:

- bacteria in the soil invade cuts, scratches or injuries in the foot
- most common in wet areas

Symptoms:

- infection and/or swelling in soft tissues of the foot
- foul-smelling discharge from the foot
- sudden severe lameness.

Treatment:

- examine foot to make sure there is no other problem such as an injury
- antibiotics

Prevention:

- provide good drainage of feedlots
- provide solid, dry footage around feeders and waterers
- use footbaths

GRAIN OVERLOAD

Cause:

- consuming large amounts of grain before rumen has adjusted with bacteria
- rapid fermentation

- acid is absorbed into the blood and can kill the animal

Symptoms:

- develop in 12-18 hours
- mild-off feed, stands alone, watery diarrhea
- moderate-weak, dehydrated staggering
- if severe-down, shock, cold, coma, death may be rapid

Treatment:

- mild-alkalizer
- moderate-empty the rumen, give fluids
- if severe, send the animal for processing

Prevention:

- start cattle slowly on grain
- at least 10% of diet should always be roughage
- mix feed properly

ENTEROTOXEMIA, SUDDEN DEATH or FEEDLOT DISEASE

Cause:

- bacteria, which is always present in the intestine, multiplies, producing a toxin which can kill an animal

Symptoms:

- temperature is lower than normal
- diarrhea
- death

Treatment:

- isolate sick calves
- ask advice from your veterinarian

Prevention:

- vaccinate cattle before they begin on full feed
- follow with a booster injection 90 days later

PINK EYE

Cause:

- bacteria

Susceptible if stressed:

- dust wind
- irritation by flies
- vitamin A deficiency
- eye injuries
- stress due to sunlight

Symptoms:

- tearing, discharge from eye
- lining of eye is swollen
- cloudiness or whitening of cornea or eye surface
- severe - eyeball may rupture

Treatment:

- very contagious
- mastitis ointment in the eye
- severe-injections in the eye
- recovered animals may remain disease carriers

Prevention:

- control face flies
- make sure rations supply adequate vitamin A
- isolate infected animals in a dust free, dark area

SHIPPING FEVER also known as BOVINE RESPIRATORY DISEASE

Bovine Respiratory Disease (BRD) is the most common and costly disease affecting the North American beef cattle industry. In the broadest sense, BRD refers to any disease of the upper or lower respiratory tracts. BRD is commonly associated with infections of the lungs causing pneumonia in recently weaned and feedlot cattle, nursing beef calves, housed dairy calves, and lactating dairy cows.

Cause:

- bacteria
- Several viruses, the most important probably being infectious bovine rhinotracheitis virus (IBR) and pestivirus, as well as bacteria such as pasteurella and haemophilus, can contribute to or cause respiratory disease in cattle. Viruses will not respond to antibiotics, but viral infections are frequently followed by secondary bacterial infections, so it is usual to use broad-spectrum antibiotics such as tetracyclines in the first instance.

Susceptible if stressed:

- changes in weather
- inadequate feed intake
- mixing of animals
- different feed and water
- dehorning, castration, etc.

Symptoms:

- fever of over 40°C (>104°F)
- depressed, doesn't move
- no appetite
- runny nose and eyes, coughing
- rapid breathing
- diarrhea
- high temperature

Treatment:

- antibiotics
- keep sick animals away from healthy ones

Prevention:

- avoid stress
- isolate new animals

Research It and Discuss It!

BRD accounts for 65-80% of the morbidity (sickness) and 45-75% of the mortality (deaths) in some feedlots. Source: Beef Cattle Research Council <http://www.beefresearch.ca/research-topic.cfm/bovine-respiratory-disease-38>

Based on a 1% death loss rate for feedlots, how many feedlot cattle die each year in Canada from Bovine Respiratory Disease?

Experience It!

Invite a veterinarian to your meeting to discuss BRD and what the vet suggests as best options for treatment.

- purchase healthy animals
- preconditioning

HARDWARE DISEASE

Cause:

- metal objects such as nails or wire are swallowed and lodge in the reticulum, often puncturing the wall
- object may also puncture the diaphragm and/or heart

Symptoms:

- uncomfortable
- stands humped up
- moves slowly
- grunts
- uncomfortable passing manure or urinating
- fever
- off feed

Treatment:

- put a magnet in the stomach to hold the object
- call your veterinarian to see if anything more can be done

Prevention:

- keep your yards free from nails, wire, and sharp objects which the animal may eat
- use a heavy magnet in the intake of grinders, rollers or hammer mills to attract foreign objects

FOUNDER

Cause:

- Inability of the animal to digest high-grain rations. Founder is an occasional end result of lactic acidosis. Protein level of the ration may be deficient.

Talk About It!

What does a cattle magnet look like and how does a magnet get into the stomach of a beef animal?

Judge It!

Have four magnets to judge. Discuss and look at cleanliness, quality, shape and appropriateness for using as a cattle magnet before making placings. Be prepared to give reasons as to why magnets were placed in the order you chose.

Signs:

- Lameness caused by heat and pain around the coronet of the hoof
- Reluctance to move
- The animal may lean back to take the weight off the front feet so that feet are forward or vertical
- Gait is shuffling and stumbling

Treatment:

- Mild cases often recover without treatment, provided the ration is corrected. More severe cases require urgent veterinary attention.

When an animal recovers from grain poisoning, feedlot bloat or founder, it rarely performs satisfactorily and should be culled.

Experience It!

Because foundering of cattle is a nutritional issue, invite a beef nutritionist to your meeting to discuss proper rations for beef cattle to prevent foundering and what imbalances can cause founder. Discuss why feedlot cattle are the most prone to foundering.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

Visit a beef farm and ask the farmer if you can see what the under-side of a hoof looks like on a beef animal. It is always good to know what a healthy hoof looks like so you know what to look for when an animal is lame and so you can determine if there is a problem with the hoof itself or if there is a different problem with the animal.

NOTE: Do not do this activity on your own! Even the best trained beef animal can be unpredictable. Proper restraints and an experience cattle handler are a must for this activity. And, no one should ever be working alone with cattle.

DIGGING DEEPER FOR SENIOR MEMBERS

In May 2003, BSE (bovine spongiform encephalopathy) was discovered in Canada in a black Angus cow in Alberta. What effect did this have on the Canadian beef industry? Document the timeline for the six months (or more) after May 2003 of the effects of this disease.

UNIT 4D: MANAGING YOUR MARKET ANIMAL

SETTING OBJECTIVES:

Beef producers have many factors to consider when caring for market animals. Members will learn about the advantages and disadvantages for dehorning, castration and growth stimulants.

Suggested Lesson Outcomes

- To understand why beef producers dehorn cattle
- To be able to identify different methods for castration of male beef cattle and the advantages and disadvantages of each method
- To understand what growth stimulants are and why they might be used in beef cattle production

Roll Calls

- What is the most important part of managing your market animal?
- Is dehorning a good idea? Why or why not?
- Is using a growth stimulant in a beef animal a good idea? Why or why not?

Sample Meeting Agenda Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Dehorning Castration Growth Stimulants	40 min + Activities
At Home Activity	Feed Additives	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

DEHORNING

Horns on cattle can cause problems for the producer. Some of these problems are:

1. Damage to other cattle by bruising during transportation and stockyard handling.
2. Aggressive animals use their horns to push others around.
3. They need more space at the feeder.
4. Horned animals may injure people.
5. There is more damage to buildings and fences by horned animals.

The proportion of beef cattle with horns has been steadily decreasing in recent years, as the availability and adoption of polled (hornless) genetics has increased. Most common breeds of beef cattle have polled lines available, and the use of homozygous polled genetics eliminates the need for disbudding or dehorning without affecting productivity.

Disbudding refers to the removal of the horn bud before attachment to the skull. The age of horn attachment varies, but occurs at approximately 2-3 months of age. Techniques for removing horn buds include removing the horn buds with a knife, thermal cautery of the horn buds with an electric or butane-powered disbudding iron, or the application of chemical paste to cauterize the horn buds. Horn removal after bud attachment is referred to as dehorning. Methods of dehorning involve cutting or sawing the horn close to the skull, sometimes followed by cautery to stop bleeding. Disbudding involves less tissue trauma when horn development is still at the horn bud stage and there is no attachment of horn to the skull of the animal. Disbudding and dehorning cause pain and distress for all cattle. Your herd veterinarian is a good resource for information on possible methods of pain mitigation during and after horn removal.

Source: Code of Practice for the Care and Handling of Beef Cattle
<http://www.nfacc.ca/codes-of-practice/beef-cattle>

Discuss It!

There are getting to be less numbers of cattle on farms that have horns. Think about the cattle on your farm. How many have horns, how many would have been dehorned when they were young and how many are polled?

What advantages are there to dehorning cattle?

Experience It!

Invite a veterinarian to your meeting to discuss pain mitigation when doing any procedure on a beef animal, including dehorning and castration. Find out what products and procedures the vet recommends.

CASTRATION

Castration is the removal of the testicles in a male animal.

Castration prevents unwanted reproduction, reduces aggression towards humans and other cattle and improves meat quality. Castration is performed using either the surgical method (knife) or non-surgical methods (burdizzo, elastrators/banding).

All methods of castration cause pain and distress, which can be minimized by castrating as early as possible, preferably within the first week of life. Early castration also facilitates restraint of the (smaller) calves, reduces the duration of the procedure and increases operator safety. Current techniques for local anesthesia during castration are not practical at a herd level. Research is currently underway in Canada to seek practical solutions to these challenges.

For individual animals castrated at older ages, there are a variety of pain control methods available from your veterinarian. Effective January 1, 2018, pain control must be used, in consultation with a veterinarian, when castrating bulls older than six months of age.

Only personnel skilled or trained in the particular method used should be allowed to castrate cattle as improper castration is unacceptable. Improper castration can cause a number of complications, including infection. “Belly bulls” (having one or both testicles trapped against the abdomen) are caused when young calves are improperly castrated with bands and only one (or neither) testicle is captured below the band. These cattle will still exhibit bull characteristics, and the testicles will require more complicated surgical removal at a later date.

Source: Code of Practice for the Care and Handling of Beef Cattle <http://www.nfacc.ca/codes-of-practice/beef-cattle>

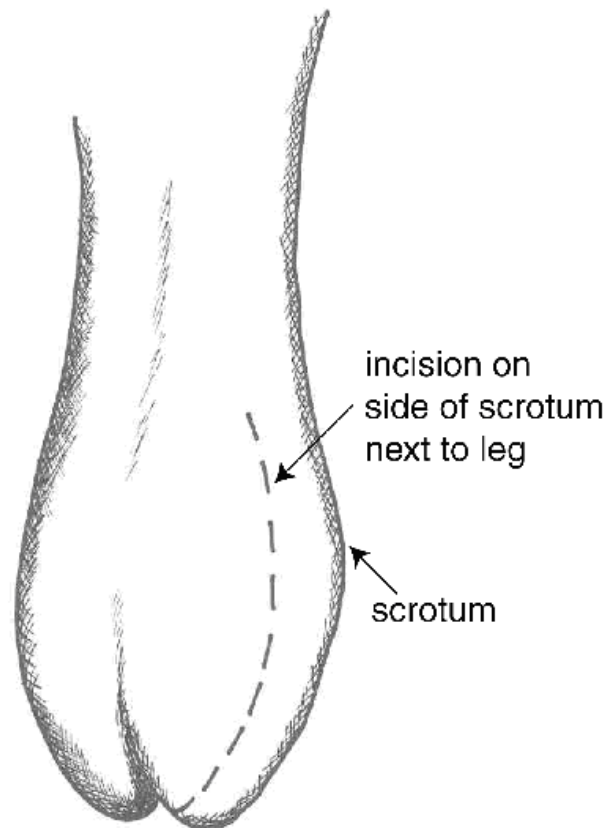
Methods of Castration

SURGICAL CASTRATION

With these methods of castration the scrotum is opened and the testicles and cords are removed. Castrate when the weather is cool. Early spring or late fall are the best times.

The Knife Method

When the testicles are removed, the scrotum should either be split on the side or the bottom third of the scrotum removed. There is less pain when the cut is made below the testicles.



Surgical incision splitting the side of the scrotum
Credit: OMAFRA <http://www.omafra.gov.on.ca/english/livestock/beef/facts/07-029.htm>

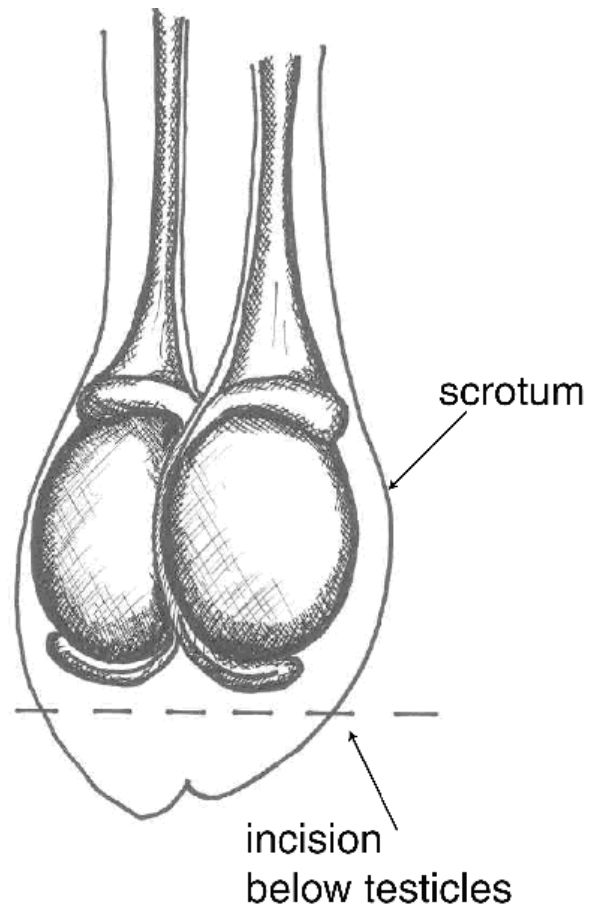
The testicle is removed by pulling or squeezing it through the opening. The testicle is pulled downward on to show the spermatic cord. The thumb is slid up and down the cord to separate it from the connective tissue. A slow, steady pull will break the muscle that controls the position of the testicle.

A dull knife should be used. The dull knife makes a rough wound which will heal faster than a clean cut. The testicle is removed by scraping the cord with a dull knife inside the scrotum until it is cut free. This is then repeated for the other testicle.

Make sure the calf has room to move around. The cut will drain as the calf moves. Keep the calf on clean bedding or pasture. Treat infections with antibiotics.

Advantages and Disadvantages:

- not bloodless, bleeding is a risk
- sure of castration because the testicles are removed
- more time to perform than banding
- risk of infections because of open wounds
- not recommended for castrating bull calves at a feedlot with wet, muddy conditions
- greater reduction in weight gain after castration compared to Burdizzo
- surgical wounds heal more quickly than those from rubber ring
- risk of injury to the surgeon



Surgical incision splitting the bottom third of the scrotum

Credit: OMAFRA <http://www.omafra.gov.on.ca/english/livestock/beef/facts/07-029.htm>

Check It Out!

There are a number of videos online to see how castration is performed. As leaders, watch the videos ahead of time to make sure videos with appropriate information are shown to members.

NON-SURGICAL CASTRATION

Non-surgical castration does not leave an open wound and can be done at any time of the year.

The Burdizzo

The burdizzo is a blunt jaw pincher used to crush the spermatic cord and blood vessels which lead to the testicles.

To use the burdizzo, the person doing the castration needs to find the testicle and the cord in the scrotum. The cord is pulled to the side of the scrotum with the thumb and index finger. The cord is clamped with the burdizzo and held for five seconds. This is repeated for the other cord and testicle.

It is extremely important to make sure the cord is crushed. If not, the calf will still develop some of the characteristics of the bull. But it is also important to make sure not to crush both cords at the same time.

This technique is continually becoming less common in the cattle industry. Compared to surgical castration, this method takes longer and has a higher failure rate (up to 35%), particularly with old or poorly maintained equipment.

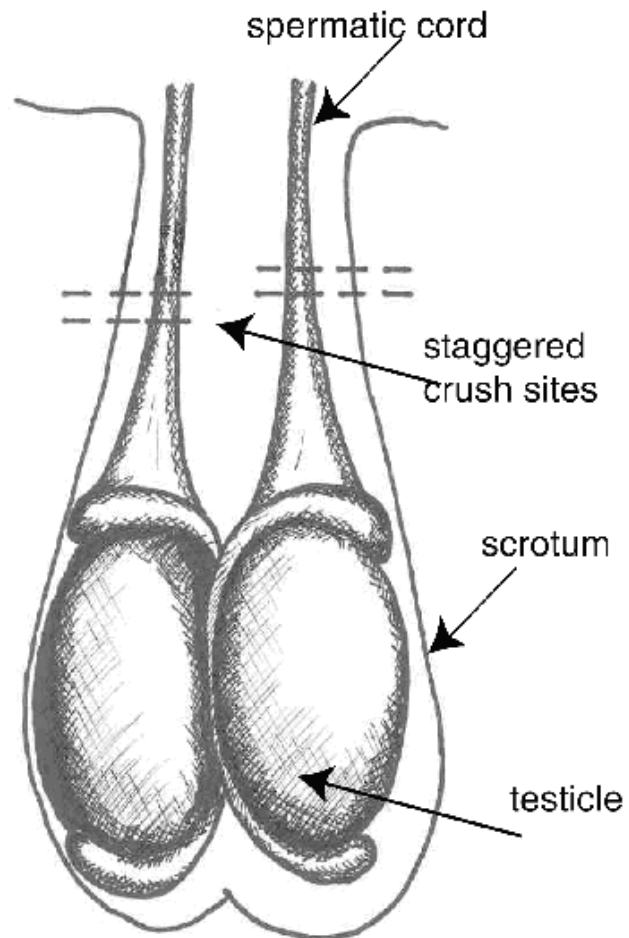
Advantages and Disadvantages:

- bloodless
- slow to perform and requires expertise
- unreliable when done incorrectly, leads to stags
- equipment becomes ineffective after long-term use and must be replaced
- less reduction in weight gain after castration compared to surgical or latex-band



Burdizzo

Credit: Precision Canada <http://precisioncanada.ca>



Burdizzo castration sites

Credit: OMAFRA <http://www.omafra.gov.on.ca/english/livestock/beef/facts/07-029.htm>

The Elastrator

Use the elastrator only on calves one month of age or younger.

The rubber band needs to be placed on the elastrator. The operator then opens the elastrator wide and slides the band up over the testicles, near the body and releases the band. The scrotum needs to be palpated to make sure that both of the testicles are below the band. The calf should receive a tetanus shot.

Advantages and Disadvantages of using the Elastrator:

- bloodless, easy to perform
- large lesions may form above the band site and persist for long times, making latex bands inappropriate for yearling cattle
- wounds heal more slowly than those from surgical castration
- newest versions of banders for older calves adjust the latex bands to correct tension
- potential for missed testicles
- band may break or band may not disrupt all circulation to the testicles
- preferred method for castrating in a wet, muddy feedlot
- infections, including tetanus and blackleg, may warrant vaccination prior to banding
- public concern about pain and animal welfare associated with banding older calves
- lower weight gains following latex-band castration compared to surgical castration



Elastrator

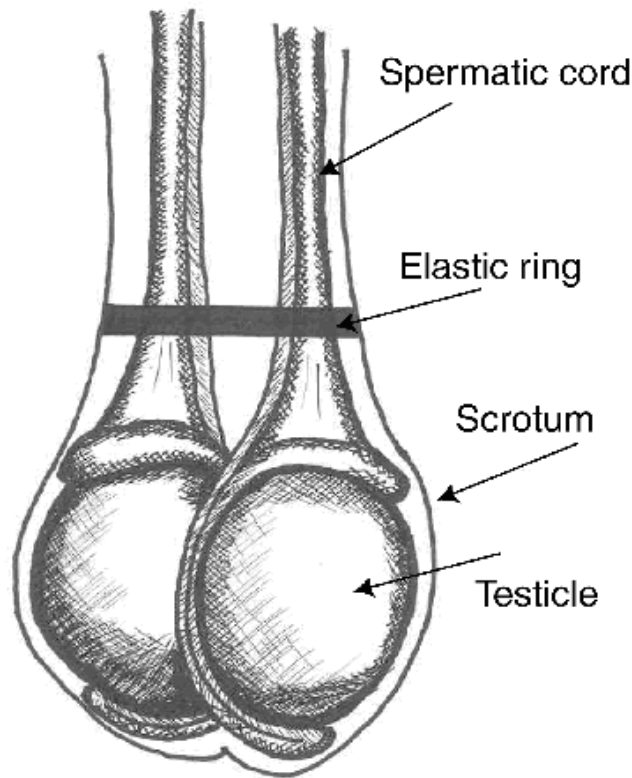
Credit: <http://hoeggerfarmyard.com>

Research It!

Find out what is meant by the term 'stag' when discussing beef cattle.

Check It Out!

Find out what the cost of an elastrator and rubber bands is and decide if this is a cost effective method for beef producers to utilize on their farms.



Elastic band at top of testicles
Credit: OMAFRA <http://www.omafra.gov.on.ca/english/livestock/beef/facts/07-029.htm>

GROWTH STIMULANTS

Improved genetics has changed the feed efficiency and growth rate of the beef animal. However, the potential of the beef animal is still limited by several factors:

1. Not all animals grow at the same rate.
2. Feed efficiency varies between animals.
3. Steers and heifers grow at different rates.
4. Animals grow according to their genetic makeup.

Beef producers are always looking for ways to increase the profitability of their animals. Growth stimulants, in the form of implants or feed additives, are available.

IMPLANTS

Growth promoting implants have been available for many years in several forms. The two major classes of implants registered for use in Canada consist of either estrogenic compounds (estradiol benzoate, estradiol 17B, zeranol) or androgenic compounds (trenbolone acetate (TBA) in combination with estradiol benzoate or estradiol 17B).

How Do Implants Work?

Implants are inserted under the skin of the animal. They slowly release substances which affect the feed efficiency and growth rate.

Implants work in conjunction with the natural hormones in the animal's body resulting in increased weight gain, improved feed efficiency and leaner carcasses. This is done through the partitioning of nutrients to support more lean tissue or muscle growth. Estrogenic compounds stimulate the animal's body to increase cell division resulting in increased muscle and skeletal growth rates. Androgenic compounds result in an increase in muscle mass by increasing protein synthesis and slowing the rate of muscle protein degradation.

Why Implant Cattle?

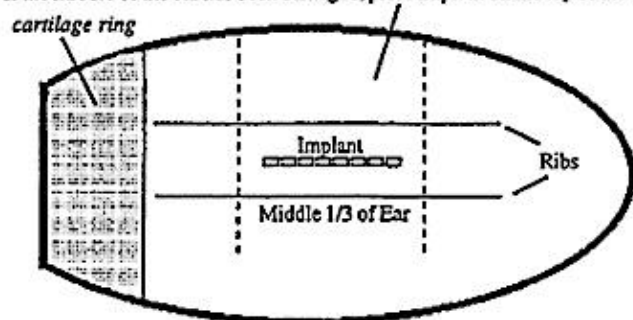
The result of implanting cattle is the production of a desirable product (lean meat) which takes less feed to produce in a shorter amount of time. It increases weight gain by 5% to 23% and feed efficiencies can improve 3% to 11%. The cost of the implants range from \$2.00 to \$6.00 and the increased gain can result in returns ranging from \$5.00 to \$10.00 for every dollar spent.

Inserting the Implant

NOTE: *implants should only be inserted by an experienced handler*

1. Familiarize yourself with the implant gun and ensure the gun is loaded properly.
2. Hold ear with one hand and insert the needle of the implant gun under the skin on the backside of the ear. The implant should be deposited in the middle third of the ear as shown below.
3. Once the needle is in place under the skin hold your thumb over the area of insertion to hold the pellets in place when the needle is retracted (whether automatic or manual). Implanting too close to the head, crushing the pellets during implantation or implanting into a blood vessel results in rapid absorption of the pellets and contributes to side effects such as increased bulling in newly implanted animals and vaginal prolapse in heifers. Avoid implanting into the cartilage ribs, as this will decrease the absorption of the implant.
4. After implanting is complete, feel for the pellets under the skin of the ear to ensure the implant has been properly deposited.

If the middle of the ear has been damaged, place implant on the top of the ear.



If the tip of the ear is missing, place implant in the outer 1/2 of the remaining ear.

Credit: Government of Manitoba <https://www.gov.mb.ca/agriculture/livestock/production/beef/growth-implants-for-beef-cattle.html>

Do It!

Find out where implants can be purchased in your area, what classes/brands area available, what the cost is per animal and how many days the implant is effective for.

Implant Considerations

There are a number of important factors to consider when selecting and using implants. In general, most implants have a higher rate of release (60% to 70% of total implant potential) within the first 30 days following implantation. All implants are effective for a certain amount of time (or payout period). When using any implant ensure that label directions are carefully followed.

Age

There are a variety of products specifically formulated for calves, feeders or finishing cattle. All formulations result in improved efficiencies and must be used according to label directions and specified weight ranges. The terminal implants used in finishing cattle should not be used in replacement animals.

Sex

Some implants are gender-specific. Caution should be taken to match the correct implant with the sex of the animal.

Breed Type

There are two main groups of breed types: exotic and British. Typically the exotic breeds (ex, Charolais, Simmental) are genetically capable of gaining more quickly and have a tendency to be harder to finish, and therefore a less aggressive implant strategy may be considered. The British breeds (ex, Hereford, Angus) are typically easier to finish and a more aggressive implant strategy may be used, creating a larger framed carcass at point of finish.

Days on Feed or Pasture

Estradiol type implants will improve gains and efficiency on pasture, as long as pasture quality is adequate and stocking density is optimum to allow gains of at least 1.5 pounds per day. Implanted livestock will consume more forage, and therefore pasture management is critical. If cattle are to be placed on feed from the backgrounding period through to finishing, it may be necessary to use an estradiol type implant followed with an androgenic type of implant. If the cattle are only on feed for the finishing period, they may be implanted with an androgenic type. The androgenic type implant is most effective when it is used in conjunction with animals receiving high-energy rations. Therefore, it is typically used as the “terminal” implant in the finishing phase in the feedlot.

FEED ADDITIVES

Growth stimulants, such as Rumensin and MGA, can be fed to a beef animal in the ration. Rumensin affects the organisms in the rumen, slightly increasing feed efficiency.

Experience It!

Visit a farm that implants their beef cattle. Observe as an experienced cattle handler inserts the implant into the ear of the cattle. If possible, feel the ear of the animal after the implant has been inserted.

NOTE:

When using growth stimulants, you **MUST** follow the instructions. Because substances are released into the animal, most of these products have withdrawal periods. This is the time period before slaughter when the stimulant must be removed. The body then has time to eliminate all the substance from its system before slaughter.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

Look at the ration the cattle on your farm are fed. Does it contain any feed additives to help with feed efficiency? Find out which additives are added and what it does in the animal to help with feed efficiency.

If you don't have your own farm to look at a feed ration for cattle, ask a beef nutritionist (or do a search online) to find out the name of at least one feed additive used for beef cattle in Canada. Then look up what this feed additive does in the animal to help with feed efficiency.

DIGGING DEEPER

FOR SENIOR MEMBERS

The use of growth stimulants in cattle can be a controversial topic and fear mongering in advertising sometimes distorts the facts. Using credible sources, put together an information sheet with facts about the use of growth stimulants. Or, find an advertisement that makes claims about the use of growth stimulants (claim can be either positive or negative towards the use of stimulants) and find the scientific sources that can back the claims made in the advertising.

BEEF BREEDING AND REPRODUCTION



SECTION 5A: CATTLE REPRODUCTIVE SYSTEMS

SETTING OBJECTIVES:

Understanding the reproductive anatomy of beef cattle is essential for good breeding management. Knowing what to look for and what could possibly go wrong will help producers make good decisions in the best interest of the herd.

Suggested Lesson Outcomes

- To be able to identify the reproductive organs of the beef cow and bull
- To understand how these organs work
- To understand their relationship in profitability

ROLL CALLS

- Give a reason why reproduction is important in beef cattle?
- What is the length of the estrous cycle in a beef cow?
- Why is Artificial Insemination beneficial?

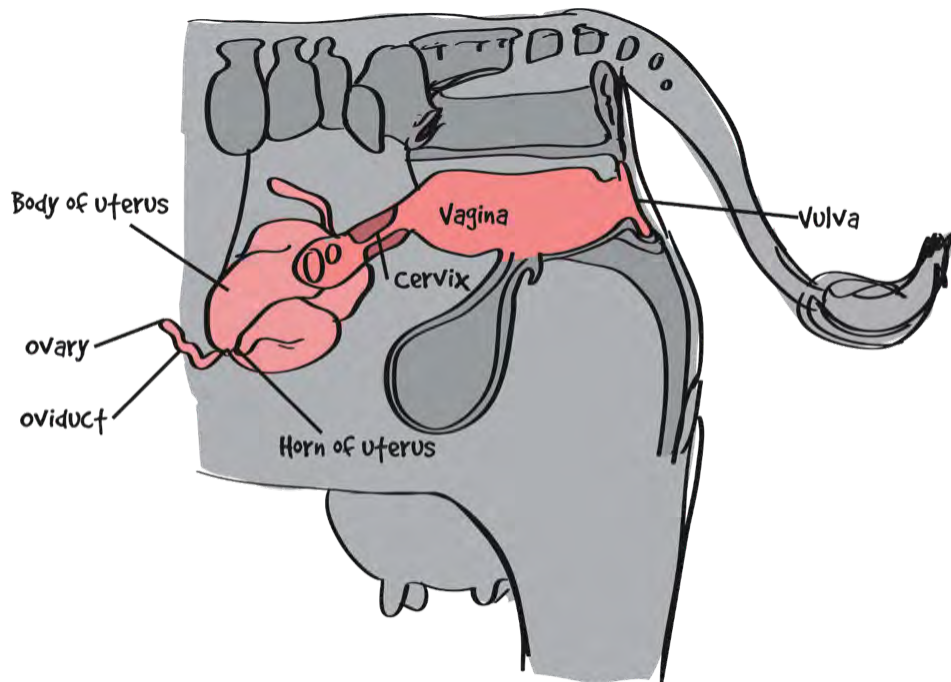
SAMPLE MEETING AGENDA

Time: 1 hour 50 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Judging Activity	Activity #4 Picture the Ideal	30 min
Topic Information, Discussion & Activities	Topic Information Anatomy of the Beef Female Explanation of the Estrous cycle Anatomy of the beef bull Activity # 1 Female Reproductive Anatomy Activity # 2 Male Reproductive Anatomy Activity # 3 Breeding Soundness Exams Activity #4 Picture the Ideal (Judging Activity)	50 min + Activities
At Home Activity	Criteria for Culling	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

MATURE FEMALE REPRODUCTIVE SYSTEM – ANATOMY & PHYSIOLOGY



Credit: 4-H Alberta

The **ovaries** produce eggs or ovum as well as hormones essential for reproduction.

The **oviducts** are the funnel-shaped tubes where fertilization will occur if both an egg and viable sperm are present at the same time.

If an egg is fertilized, it develops into an embryo and will travel to the uterus to implant itself to the wall of the uterus. The main function of the uterus is to provide a suitable environment for fetal development. This is where the fetus will remain until birth.

The **cervix's** thick walls and opening to the uterus relax only to create a passageway for sperm to enter and for the calf to travel through during birth. The cervix remains tightly closed during pregnancy.

The **vagina** is the passageway that connects the cervix to the outer opening of the reproductive tract called the **vulva**.

Two of the essential organs for reproduction are located in the animal's brain – the hypothalamus and the pituitary gland.

An estrous cycle is a series of changes in a mature female animal's reproductive system that happen in response to hormonal and physiological changes also happening in the animal's body.

The length of the cycle is measured as the time between two consecutive estrus or heat periods. The average length of a cycle for mature female beef cattle is 21 days, but a cycle that lasts between 17 to 24 days is still considered normal.

The beginning of the cycle is signaled by the mature female showing signs of being in estrus, or standing heat.

Estrus, or Standing Heat

Estrus, or standing heat, is the time period when a cow or heifer will accept the male. The best way to detect standing heat is to observe cycling cows or heifers for changes in her behaviour.

The best time of day for detecting if cows or heifers are in standing heat is early in the morning or evening. Observe them 2-3 times a day, without disrupting their normal behaviour, for approximately 30 minutes.

Look for the following indicators:

- Stands to be mounted by a bull or other cows, or has mud on her rump and sides.
- Is restless or nervous, may be bawling or more vocal than usual.
- Groups together with other animals in heat.
- Vulva is swollen, and bright red in color.
- A clear, mucous discharge may be observed.

Estrus or heat detection is of utmost importance for successful breeding management. This is due to the fact that ovulation occurs not long after the beginning of a period of estrus or standing heat, and is the optimal time for natural service or artificial insemination to occur for successful fertilization.

If the animal was bred, and fertilization did occur:

- The hormone progesterone will prepare the uterus for pregnancy and the animal will produce chemical signals for the animal's body not to return to estrus.

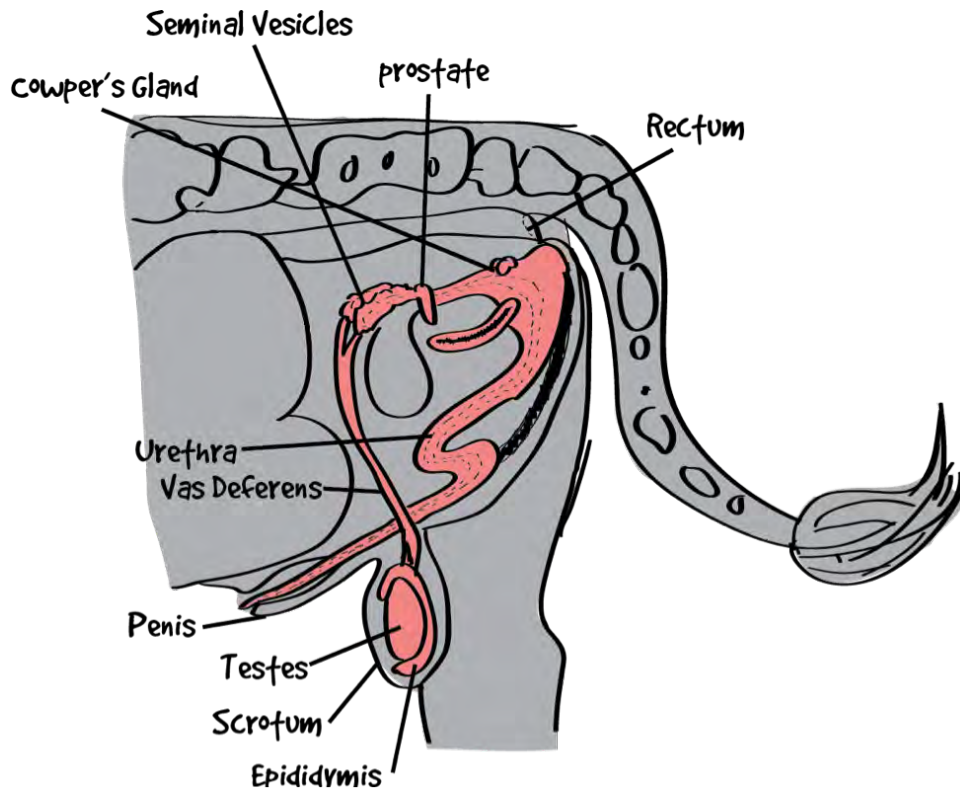
If the animal was not bred, and fertilization did not occur:

- The hormone prostaglandin will be produced and bring the animal back into estrus or standing heat in the next two to three weeks, when the cycle will begin again.

The estrous cycle will repeat over and over until the mature female animal becomes pregnant. Producers need to be aware that some mature female animals do not cycle normally and others may show no signs of estrus. They should talk to their veterinarian if they think that either of these things may be happening.

Talk About It!

Invite a cow-calf beef producer to the meeting and have him/her talk about heat detection in their herd and how they manage it.



Credit: 4-H Alberta

MATURE MALE REPRODUCTIVE SYSTEM – ANATOMY & PHYSIOLOGY

The **scrotum** provides protection to the testicles and also helps to regulate the temperature for optimum sperm development.

The two **testes** produce sperm, as well as the hormone that gives the mature male his masculine characteristics and appearance.

The **epididymis** stores viable sperm and carries it from the testicles to the **vas deferens**. The vas deferens unite into a single tube that is called the urethra.

The **urethra** contains the **accessory glands** that secrete fluids that add volume to the sperm, activate them to be mobile as well as flush and cleanse the reproductive tract.

The semen travels out of the body through the **penis**.

Breeding Soundness Examinations

Breeding soundness examinations may be conducted to assess whether or not cattle are ready for the breeding season. Breeding soundness examinations should be administered by a veterinarian. It's a small investment that can really enhance a producer's breeding program and therefore profitability.

Breeding Soundness Examinations for Bulls

Prior to the breeding season, it's important to assess the breeding potential of bulls, or herd sires, as they have a huge impact on the overall herd fertility. A breeding soundness examination of a bull involves a:

- Physical soundness examination
- Careful internal and external examination of the reproductive tract
- Semen evaluation

By not conducting Breeding Soundness Examinations, producers risk lower pregnancy rates.

Cull Cows

One of the ways to improve the reproductive performance of the herd is to remove, or cull, animals that aren't performing well.

Producers might consider culling:

- Cows that are open, or in other words, do not become pregnant.
- Cows that calve late in the calving season.
- Cows that lost their calf due to excessive calving difficulty.
- Cows that perform poorly, or in other words, produce poor quality calves.
- Cows that have a poor disposition, poor health, conformation or aren't structurally sound. Producers often replace culled cows by:
 - » Purchasing replacement cows, or
 - » Selecting replacement heifers from their own heifer calf crop.

Replacement Heifers

Producers should consider the following when selecting their replacement heifers:

- Was the heifer calf born early in the calving season?
- What is the heifer calf's estimated mature frame score and size?
- Is the heifer calf structurally sound with good conformation?
- Does the heifer calf have a good disposition?
- Was the heifer calf's dam (or mother) a good producer?

Check It Out At Home!

Does your farm do Breeding Soundness Examinations?

Talk About It!

Have you ever culled cows out of your herd? What was your reasoning?

Look It Up!

What is the proper nutrition for heifers that are destined to become bred heifers?

It's important that a proper management plan is developed specifically for these heifer calves as most producers aim for heifers to have their first calf by 24 months. To achieve this goal it's crucial that they manage their heifers, and their nutrition program, so that the heifer calves will gain the necessary weight to come into estrous in order to conceive by the time they are 15 months of age.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

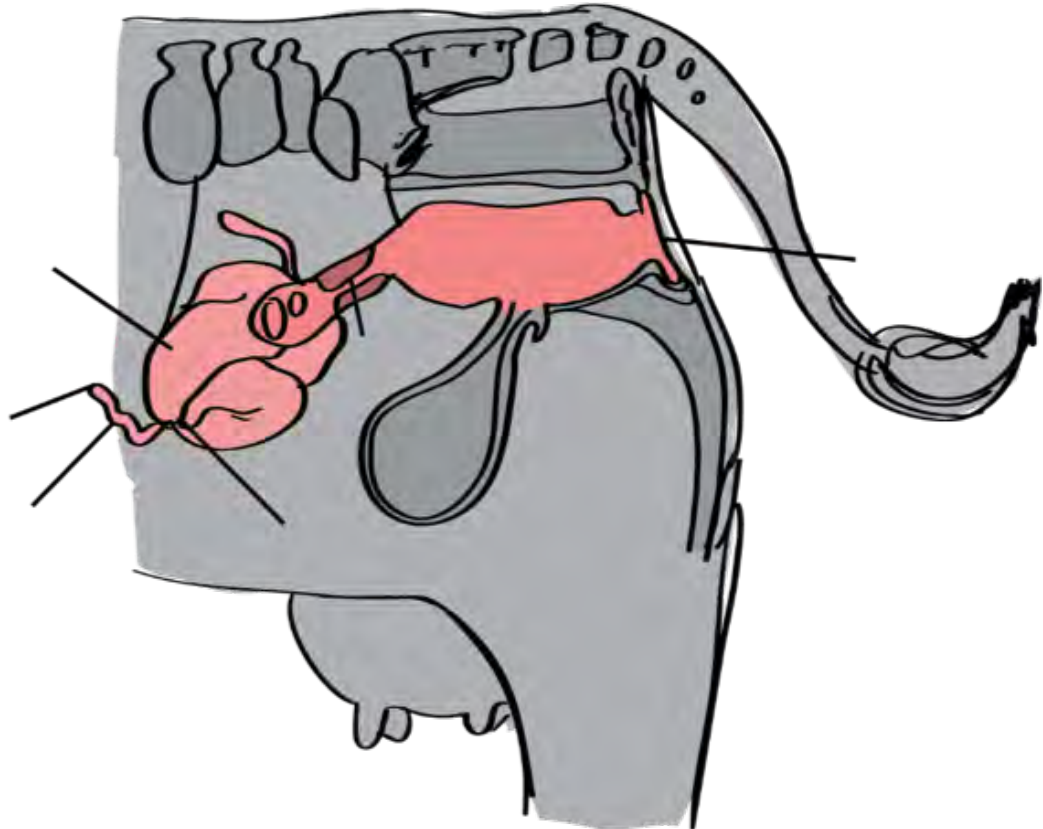
ACTIVITY #1

MATURE FEMALE BOVINE REPRODUCTIVE SYSTEM - ANATOMY

DO	<p>Time: 15 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">– Mature Bovine Female Reproductive System - Anatomy worksheet– Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">– Give each member a Mature Bovine Female Reproductive System - Anatomy worksheet– Explain the worksheet and have members fill in the label the diagram to identify the parts of the female reproductive system.– Review the worksheet and discuss what each part of the reproductive system does
REFLECT	<p>Learning Outcomes:</p> <p>To be able to identify all parts of the female bovine reproductive system. This will allow members to better understand female reproduction as they progress in their knowledge of beef cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">– Why is it important to be able to identify the parts of the reproductive system of the female bovine?– How do parts of the reproductive system work with each other?– Was it easy or hard to fill out the worksheet?

ACTIVITY # 1 MATURE BOVINE FEMALE REPRODUCTIVE SYSTEM - ANATOMY

Instructions: Label the diagram with the following terms.



Ovaries

Body of the Uterus

Oviducts

Uterus

Cervix

Vagina

Vulva

Credit: 4-H Alberta

ACTIVITY #2

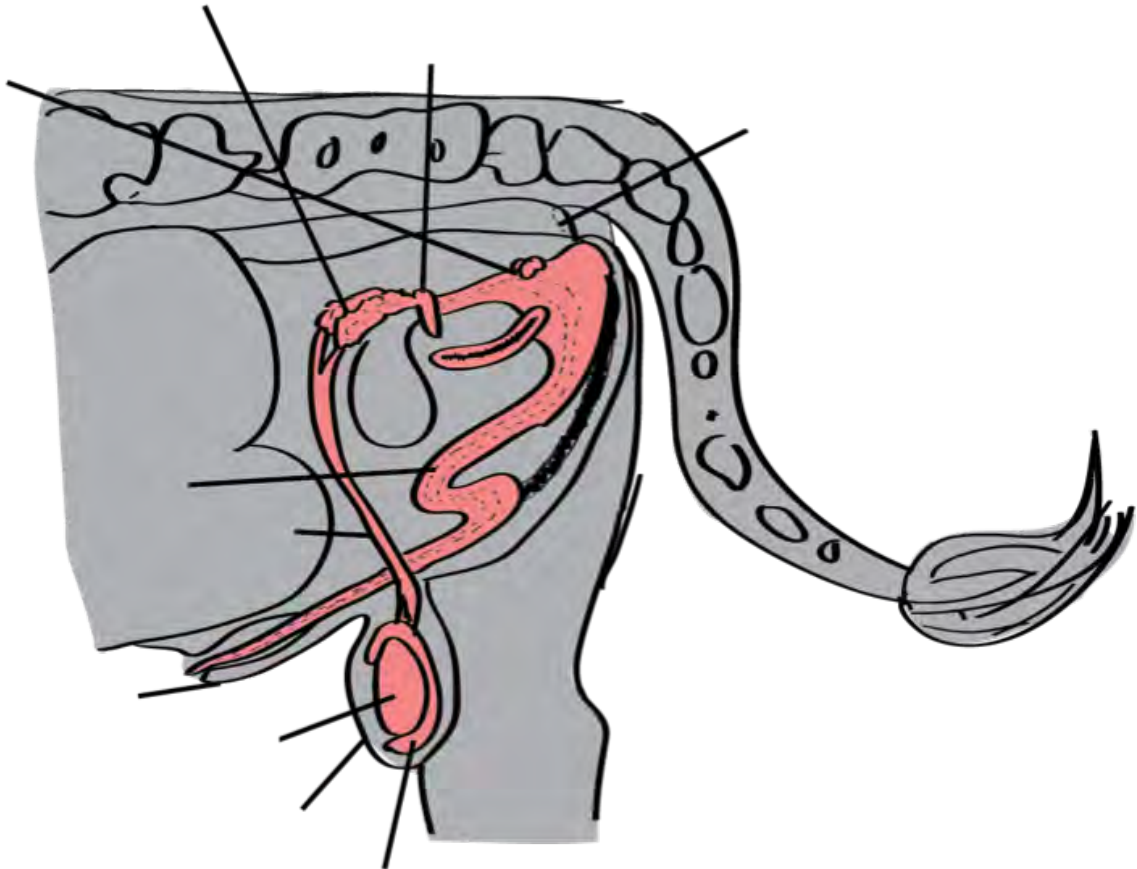
MATURE BOVINE MALE REPRODUCTIVE SYSTEM - ANATOMY

DO	<p>Time: 15 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">– Mature Bovine Male Reproductive System - Anatomy worksheet– Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">– Give each member a Mature Bovine Male Reproductive System - Anatomy worksheet– Explain the worksheet and have members label the diagram to identify the parts of the reproductive system– Review the worksheet and discuss what each part of the reproductive system does
REFLECT	<p>Learning Outcomes:</p> <p>To be able to identify all parts of the male bovine reproductive system. This will allow members to better understand male reproduction as they progress in their knowledge of beef cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">– Why is it important to be able to identify the parts of the reproductive system of the male bovine?– How do parts of the reproductive system work with each other?– Was it easy or hard to fill out the worksheet?

ACTIVITY # 2

MATURE MALE REPRODUCTIVE SYSTEM - ANATOMY

Instructions: Label the diagram with the following terms.



Scrotum

Testes

Epididymis

Vas Deferens

Penis

Seminal Vesicles

Cowper's Gland

Prostate

Credit: 4-H Alberta

ACTIVITY #3 BREEDING SOUNDNESS EXAMS

DO	<p>Time: 15 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">– Breeding Soundness Exam worksheet– Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">– Give each member a Breeding Soundness Exam worksheet– Explain the worksheet and have members answer the questions– Review the worksheet and discuss the answers to each question
REFLECT	<p>Learning Outcomes:</p> <p>To have a better understanding of the importance of breeding soundness examinations for both male and female cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">– Are there any downfalls to conducting breeding soundness exams?– Was it easy or hard to fill out the worksheet?– Did you learn something new while working through this exercise?– Will you start (or continue) doing breeding soundness exams with your cattle?

ACTIVITY #3 BREEDING SOUNDNESS EXAMS

Instructions: Answer the following questions on breeding soundness examinations.

Q: Why is it important to conduct breeding soundness examinations?

A:

Q: Who should perform a breeding soundness examination?

A:

Q: Describe what is involved in a Breeding Soundness Examination for bulls?

A:

ACTIVITY #4
PICTURE THE IDEAL (JUDGING ACTIVITY)

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> – Cards with items written on them. – Writing utensil and paper <p>Instructions:</p> <ol style="list-style-type: none"> 1. Divide the group into groups of 2 or 3 2. Give each group a card with an item on it. <p style="padding-left: 40px;">The items on the card can be anything such as: truck ice cream water juice laptop burger lasso halter show stick</p> <ol style="list-style-type: none"> 3. Have each group develop a list of 10 characteristics of their ideal item 4. Have members put their terms in order of importance, numbering them from 1 for the most important and 10 for the least important. 5. If time permits have the groups share their lists with each other.
REFLECT	<p>Learning Outcomes:</p> <p>To teach the importance of:</p> <ul style="list-style-type: none"> – Identifying characteristics to look for – Prioritizing these characteristics
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none"> – Before you judge any class, you must know exactly what you are looking for, and which of these is the most important. How do you determine this? This will make the job of judging much easier because you will know exactly what you are going to look for before you ever get to the class. – Is there anything that would make this activity easier?

AT HOME ACTIVITY

Evaluate you home herd based on the criteria for culling

DIGGING DEEPER FOR SENIOR MEMBERS

- 1) Research various methods of estrus detection which are available to the breeder.
- 2) Develop your own list of criteria for culling cows or heifers from a group
- 3) Create a list of criteria to use when purchasing replacements
- 4) Compare the 2 methods (purchasing or developing your own) of replacing females in the herd

MEETING 5B: SELECTING AND RAISING HEIFERS

SETTING OBJECTIVES

There are many factors to consider when selecting heifers for a breeding program. Management when raising heifers is also crucial to a successful beef farm.

Suggested Lesson Outcomes

- To educate the members as to selecting and developing of beef heifers.
- To highlight some of the key differences between raising heifers and maintaining the cow herd.

ROLL CALLS

- Will you be keeping your 4-H project as a replacement animal?
- Which is better: buying replacement heifers or raising your own? Why?

SAMPLE MEETING AGENDA

Time: 1 hour 45 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Judging Activity	Activity #1 Selecting the Best Show Halter	30 min
Topic Information, Discussion & Activities	Topic Information Selecting Replacement Heifers Developing Replacement Heifers Activity # 2 Selecting and Raising Beef Heifers	35 min + Activities
At Home Activity	Assessing your 4-H project	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

SELECTION

Beef cattle producers should use all available information when selecting replacement heifers. Selecting a replacement heifer by appearance only is very risky. A heifer must be of the acceptable type if she is to be kept as a replacement, however, she must also have the genetic potential to produce a heavy calf. This is the reason that records must also be utilized when making the selection. All available records should be used to insure that the better heifers are being considered as replacements. The heifer with the heaviest weaning weight may or may not be the best replacement heifer. A heavy, fat heifer at weaning is a poor choice as a replacement. The heifer must also be of an acceptable type.

Keep disposition in mind when making heifer selections. Do not save that heifer that escaped the day other heifers went to market. Heifers with bad dispositions create problems as long as they remain in the herd.

Producers should keep in mind the frame size and weight they want their cow herd to be when selecting heifers. The mature weight and size of cow herds will be increased by continually selecting the very biggest heifers. Are the heifers being considered going to make cows that will weigh 1300 to 1400 pound cows at maturity? If the cow herd is already about the desired size it may be best to select the heifers with good growth that are about average in size rather than the very largest.

Select those heifers that were born early in the breeding season. The heifers have a better chance of calving with the rest of the herd. Late calves are generally from those cows that calve late in the calving season. Don't perpetuate the problem of late calves.

Always select about 50% more heifers than needed to allow for culling of heifers that do not develop properly or do not breed.

Remember, when selecting the best replacement heifers use all available information instead of using partial information and hoping for the best.

DEVELOPMENT

One of the major challenges facing many beef producers is the development of replacement heifers for the breeding herd. Research has shown that the lifetime productivity of beef females can be increased by calving heifers at two years of age. This goal can be achieved by producers willing to provide the required nutrition and management to the growing replacement heifer.

Debate It!

Do heifers with bad dispositions make for a mother that is more protective of her calf? Is it worth the risk to the safety of the humans who have to work with this heifer?

Age at First Calving

Producers should aim to calve their replacement heifers by two years of age. This practice will improve the profitability of the beef operation by offsetting the high costs of feed, labour and investment in raising replacements. To produce the maximum pounds of calves in her lifetime, a cow must calve each year starting as a two-year-old. Research has shown that this is indeed true—heifers calving at two years of age produced an extra 330 pounds of calf on a lifetime basis over heifers calving at three years of age.

Nutrition and Development of Replacement Heifers

Optimum reproductive performance and lifetime productivity of a cow are clearly tied to proper nutritional management of replacement heifers during growth and development of structure and reproductive function. For heifers to reach puberty at 14-15 months of age, they must be adequately grown, but not excessively fat. Three factors associated with puberty in the replacement heifer are weight, age and breed. Weight is thought to be the major determining factor affecting puberty in heifers at 14-15 months of age. Larger, later maturing breeds reach puberty at an older age. Producers, who have the most control over weight gain in their cattle, should establish target weights at which heifers are to be bred and develop a feeding program to allow heifers to reach that goal in good condition. Target weight will vary with each breed.

Weight at Which 14-15 Month Old Heifers Reach Puberty.

Percent of Heifers in Heat	Angus	Hereford	Char.	Angus X Hereford	Simm. X British	Lim. X British
50	550	600	700	550	650	650
65-70	600	650	725	600	700	700
85-90	650	700	750	650	750	750

Ref: K. Lusby.

Replacement beef heifers should attain 65 to 70% of their potential mature weight by the time they are bred at 14-15 months of age. This would mean that heifers should gain an average of 1.25 to 1.75 lb. per day from weaning to first breeding or 250 to 350 lbs. during the first winter (depending on breed). For most breeds and crosses, heifers should weigh from 650 to 850 lbs. at breeding time.

Talk About It!

What is the target weight for your heifer(s)?

Conception rates in heifers will vary depending on how well they have been grown. If heifers are to be good lifetime producers they must calve early. To achieve this they must show heat and conceive early in the breeding season.

Mismanagement through over or under feeding during the critical phases will adversely affect lifetime productivity. Energy intake beyond needs for structural and muscular growth in heifers may cause problems regarding their potential of milk production (e.g. creep feeding). Research has shown that negative relationships between maximum probable producing ability of dams and milk production in offspring do exist.

The basis of the problem is the infiltration of fat into the udder which may later restrict future milk producing ability of these heifers as cows. Therefore, when selecting and feeding for milk production, the optimal level rather than maximal level must be the target to avoid impairing production of replacement heifers.

Mineral and Vitamin Requirements

Mineral and vitamin requirements have to be met to ensure adequate growth and fertility. Commercial mineral mixes can either be fed on a free choice basis or mixed with the ration.

Monitor Growth

Monitoring growth with periodic weighing will tell how well heifers are growing on specific rations. Thin or overconditioned heifers should be avoided. Visual appraisal of heifer body condition can also be important in making adjustments to the feeding program. As mentioned earlier research has indicated that overconditioning replacement heifers can impair future milking ability and if continued could also result in increased calving difficulty.

Check It Out!

What mineral mixes are available from your local feed mill? What mixture do they recommend for a breeding heifer?

Breeding Replacement Heifers

Replacement beef heifers should be bred three weeks prior to the breeding of the mature cow herd since heifers require a longer period of time to begin cycling and show heat after calving than mature females. Heifers bred before the main cow herd, will calve earlier in the season and should be cycling normally by the time the main cow herd is being bred the following year, provided adequate nutrition and management are in place. If heifers are to be good lifetime producers, they must show heat and conceive early in the breeding season. A breeding season of forty-five days should be adequate for well grown heifers. Pregnancy check heifers and cull those that are open.

The Pregnant Yearling

The pregnant yearling heifer should continue to gain during her second winter at a rate of approximately one pound per day up to calving. At this point in time the heifer needs additional nutrients to meet her own needs, for continued growth, as well as, for gestation. These pregnant growing heifers must be handled as a separate management group.

Calving Management

The two main problems facing cow-calf operators in breeding replacement heifers to calve at two years of age are greater difficulty at calving and poor conception rate after calving.

More two-year-old heifers require assistance at the first calving than three-year-olds. In most cases 20 to 30% of two-year-old first calf heifers will require assistance. It is important then that these first calf heifers be managed and fed separately to ensure that they do not become over or under conditioned and that calving be monitored more closely in order that assistance can be provided if and when necessary.

Feed restriction during the latter stages of pregnancy is not a wise approach to managing first calf heifers. Research has shown that feeding below recommended levels will only slightly reduce the birth weight of calves, unless a severe restriction in energy is imposed. However, this does not necessarily reduce calving difficulty because reduced energy intake reduces the size of the heifer herself. Specifically the pelvic opening is reduced in underfed heifers and no reduction in calving difficulty is observed. Underfeeding heifers does result in heifers weak at the time of calving, lower calf survival rates, less milk for calf growth and rebreeding is more difficult. Overfeeding, in late pregnancy causing heifers to become overly fat, is associated with increased calving difficulty and should be avoided.

Preventing Calving Difficulty (Dystocia)

Calving difficulty in two-year-old heifers is caused by undersized heifers or oversized calves. These are not one in the same. Birth weight is controlled mainly by genetics and is considered to be the primary cause of calving difficulty. This trait is highly heritable and has a significant correlation with calving difficulty which reinforces the need for the recording of accurate birth weights of breeding animals in order to help reduce the incidence of dystocia. Proper development and growth of replacement beef heifers is in the control of cattle producers. Considerations for minimizing calving difficulty:

Mate yearling heifers to low risk bulls;

- A proven bull for calving ease
 - A moderate to low birth weight bull of her own breed
1. Feed pregnant heifers adequately: do not underfeed or overfeed.
 2. Give first-calf 2-year-old heifers extra attention at calving time.
 3. Know when and how to give assistance and when to consult a veterinarian.
 4. Within a herd, select replacements from among the larger (older and growthier) heifers.
 5. For long term progress in a herd, select sires having above average EPDs for maternal calving ease.
 6. Possible use of pelvimetry to cull replacement heifers with extremely small pelvises.

Calving problems in two-year-old heifers are very common. Permanent solutions to the problem demand long range breeding and management goals for the future of the breeding herd. Calving ease should be a priority for all.

Reach Out!

Invite your local veterinarian to the meeting to discuss difficult calvings (dystocia). Ask what to look for and how long you should wait before calling the vet.

Career Choice!

Ask a local large animal veterinarian why they choose their profession. Do they specialize in beef? Do they have any pointers for those who are thinking about becoming a veterinarian? What is the best thing about their job? What is the most challenging thing?

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

ACTIVITY #1

SELECTING THE BEST SHOW HALTER (JUDGING ACTIVITY)

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">– Four halters– Writing utensil & paper <p>Instructions:</p> <ul style="list-style-type: none">– Assemble a group of four halters to be judged on a table. Include 3 show halters in various stages of condition, with one of them being near perfect. Add a rope halter to the group as the 4th halter.– Have members judge and give reasons as to the order they would pick if requiring a show halter for their project to enter the ring.
REFLECT	<p>Learning Outcomes:</p> <p>To understand the importance of techniques needed for critical thinking skills. Members will be able to identify characteristics to look for and learn how to prioritize these characteristics.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">– Was this activity difficult or easy? Why?– Did everyone have the same placings? Did you change your placings after hearing someone else give their reasons?– Why is it important to learn critical thinking skills?

ACTIVITY #2
SELECTING AND RAISING BEEF HEIFERS

DO	<p>Time: 15 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">- Selecting and Raising Beef Heifers worksheet- Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">- Give each member a Selecting and Raising Beef Heifers worksheet- Explain the worksheet and have members answer the questions about selecting and raising beef heifers.- Review the worksheet and discuss each question.
REFLECT	<p>Learning Outcomes:</p> <p>To be able to identify the proper information they should know about selecting and raising beef heifers.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Did any of the answers surprise you? Why?- Did you change your thoughts about selecting and raising heifers by completing this exercise?

AT HOME ACTIVITY

Assess your own 4-H project and determine if you are following a good heifer development program

DIGGING DEEPER FOR SENIOR MEMBERS

- Research different feeding regimes when raising replacement heifers
- Analyze your own heifer selection and development programs
- Compare the advantages and disadvantages of buying replacement heifers vs raising your own

ANSWERS TO ACTIVITY #2

1. False
2. False
3. True
4. True
5. True
6. True
7. True
8. False

SECTION 5C: GENETIC EVALUATION

SETTING OBJECTIVES

Knowing which traits to look for in a heifer, cow or bull are essential to building up a quality herd. Before being able to assess animals, members need to understand which traits are important and be able to understand EPD numbers.

Suggested Lesson Outcomes

- Recognize the various traits used in a genetic evaluation
- Be able to read a genetic evaluation for a particular animal
- Determine which animal they would select for their own operation based on the traits they are selecting for

ROLL CALLS

- What is a genetic evaluation?
- What do you feel is an important trait to select for?
- What is an EPD?

SAMPLE MEETING AGENDA

Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Judging Activity	Judging Activity #1 – Bull Selection	10 min
Topic Information, Discussion & Activities	Topic Information Introduction to Genetic Evaluation Abbreviations and their meanings on a Genetic Evaluation Example of EPDs given for a particular bull Activity # 2 - Group of Hereford Bulls	30 min + Activities
At Home Activity	Do some research on particular bulls for your operation	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

GENETIC EVALUATION

EPDs can be quite intimidating and confusing for the novice cattle person, to the point where it gets overwhelming when having to choose a new herd bull for your herd. But, once you understand what EPDs are and know how to read them, they simply become a highly useful tool in determining how to choose the next best herd sire or purebred cows for your operation.

Generally, Expected Progeny Differences or EPDs are numbers that predict the genetic quality of future offspring or progeny of a particular bull, cow or heifer. It is a method that helps a cattle producer, purebred or commercial, to determine whether that particular bull, cow or heifer is sufficient to produce the desired calves needed to either help improve the genetic quality of a breeding herd, or to sell to the meat market. However, this tool is considered to be most difficult part of breeding cattle because it involves reading, interpreting and understanding the various numbers and abbreviations that are present for a particular animal of interest.

Get a breeder or bull sale catalogue, or even a catalogue from an AI company. You can find these on the internet or by contacting various breed-specific organizations to get a hard-copy of some bulls and females to look over. Local seedstock breeders that are having a bull sale in the near future and bull testing stations where bulls are being held are both good sources to get a catalogue from on the bulls and heifers that are being made ready to sell. Various AI companies like EastGen and Semex are also a great source to go by to analyze the various EPD values for various bulls that have semen available to be used. Much of the information on the bulls they have available can be obtained on-line or by ordering a catalogue.

Find a particular bull, cow or heifer that catches your eye.

It doesn't matter what bovine you choose: it can be the first one on the page. But you will be needing to look at the EPD numbers that pertain to that animal to follow the rest of the steps below

Start by looking at the abbreviations found in the EPD chart.

There are two types of abbreviations found in most EPD charts:

The production traits, and the accuracy values. Accuracy

values are either as percentage values or positive/negative values, and come in the form of the abbreviation ACC. Production traits are the actual EPDs that are analyzed in the selection of a herd bull, cow or heifer. Some of the more common traits, their abbreviations and meanings

Look It Up!

After looking through any type of beef catalogue, if money was no object, pick one animal you would choose for your herd.

(with emphasis placed on bulls as sires) that are commonly reported on most EPD tables are as follows:

- **BW (Birth Weight):** Birth weight of a sire’s progeny when compared to the breed average, in pounds (lbs).
- **WW (Weaning Weight):** Adjusted to 205 days excluding maternal effects (evaluated as milk), in pounds (lbs).
- **YW (Yearling Weight):** Adjusted to 365 days excluding maternal effects in pounds (lbs).
- **MK (Milk)*** A measure of the pre-weaning performance, pounds of calf attributed to the milking ability of a sire’s daughters. *(Note the use of the term “milk” is inaccurate because the trait measures all maternal effects, of which milk is the major but not the only factor.)
- **CE (Calving Ease):** The ease with which a sire’s calves are born. This is expressed in a percent of unassisted births, with the larger positive numbers indicating greater calving ease. This EPD is determined largely by the weight of the calf.
- **CEM (Calving Ease Maternal):** Predicts calving ease of a sire when mated to heifers. Expressed as difference in percentage of unassisted births, with a higher value indicating increased calving ease in first-calf heifers.
- **CW (Carcass Weight):** The adjusted carcass weight of a sire’s progeny expressed in pounds (lbs).
- **DOC (Docility):** This is the measure of an animal’s temperament, nervousness and flightiness when handled.
- **Fat (Fat Thickness):** This trait is the back fat thickness measured over the ribeye at or between the 12th and 13th ribs. It is used as a predictor of total body fat being the major factor in calculating yield grade.
- **IMF (Intramuscular Fat):** This reflects differences in a 365 day adjustment of intramuscular fat measured over the 12th and 13th rib in live cattle using ultrasound. (Trait reported in Angus, Charolais [included in marbling EPD] Limousin and Hereford breed associations.)
- **MARB/Marb, MB (Marbling):** This is a 365-day adjusted marbling score measured in

Discuss It!

Which trait in a bull is the most important? Which traits would you place more emphasis on?

USDA marbling degrees. This is the primary factor in USDA quality grades. This trait would also be measured the marbling degrees for breeds with this EPD found in other countries besides the USA, such as Canada, Australia, and South Africa.

- **M&G, TM, MWW (Milk and Growth/Maternal Milk and Growth, Total Maternal, Maternal Weaning Weight):** This is a measure of a sire's ability to pass on milk production and growth rate through his daughters. It predicts the total weaning (direct and maternal) that will be displayed in his daughters' offspring. It is calculated by adding half of the Weaning Weight EPD with the Milk EPD ($[1/2 \text{ WW EPD}] + \text{MWW EPD}$). This trait can be calculated for all breeds participating in the National Cattle Evaluation analysis.
- **REA, RE (Ribeye Area):** Ribeye area measured in square inches between the 12th and 13th rib and adjusted to 365 days. This is a good predictor of the total amount of muscle in the carcass and is highly related to carcass weight.
- **SC (Scrotal Circumference):** This is the predictor of sperm-producing tissue as measured in centimeters. Scrotal circumference is highly related to age at puberty in male and female progeny.
- **Milk (MK):** the expected differences in a bull's daughters' calves at weaning weight due to their milking ability. Milk is looking at how well daughters milk and how that translates to the weaning weights of their calves. A higher MK EPD indicates a higher weaning weight due to the bull's daughters' milking ability.
- **Total Maternal (TM):** TM predicts the total difference in weight of a bull's daughters' calves at weaning. A portion of this difference in weight comes from the milking ability of the bull's daughters (MK EPD), and a portion comes from the genes for growth passed from the bull to his daughters and then on to their calves. The TM EPD is calculated by taking $\frac{1}{2}$ of a bull's WW EPD + his MK EPD.

Note that **not all** of the traits used in various breed associations have been mentioned. It is suggested that you check out the breed association website applicable to your breed for additional EPDs and their definitions.

Check It Out!

Visit a breed association website to find additional EPD's and their definitions.

Analyze the numbers that go with the abbreviations mentioned above. Depending on the traits themselves, there is always going to be some sort of concern if numbers go into extremes or are

significantly separate from the average-breed-EPD values. There would be cause for concern if, for example, a bull has a high BW EPD, or a negative SC EPD.

- Remember that there are both numbers showing you the accuracy of the EPD values and the EPD values for the production traits themselves.
- The majority of the numbers don't go over 100 or below -10, and the accuracy range is from 0.0 to 1.0, or on a percentage-basis.
- Accuracy values are published with an EPD to indicate the amount of risk that an individual will take when using an animal in a breeding program. It is a reflection of the number and distribution of progeny per sire along with how much pedigree information is available. This accuracy gives us an indication of how close estimates are to an animal's true genetic value and is an extremely useful tool to breeders in determining the reliability of an EPD.
- The higher the accuracy value, the less risk there is to an EPD value changing as additional data is included. That being said, bulls with low accuracies should be used on a limited basis, while bulls with high accuracies can be used as deemed necessary.

Know and become familiar with the current averages for a breed. All EPDs are reported relative to a base population, making each breed's base year arbitrary. Most bases are obtained by forcing the EPDs for all animals in a particular year to add to zero. Thus, the EPDs reported on animals born in the current year are relative to the average genetic merit of the animals born in the base year.

- Note that an animal with a 0.0 EPD does not necessarily mean that they are at the current breed average for that EPD value. For example, a Charolais born in 2006 with a birth weight EPD of +2.3 would be the average for BW EPD of the Charolais breed, while a bull with a 0.0 EPD would be below the current average.

Put the context of EPD values into your purchase of a new bull. The majority of bulls these days have some form of EPD values put on them, so you will need to study the values and accuracies and base your decisions on the right bull for you for your herd.

- Don't just choose any bull. You will need to first analyze your cow herd and see where the weaknesses are. Wherever you find weaknesses you will need to try to find as strengths in your potentially new bull. In either extremes, a bull is selected to either improve daughters for replacements, or maximize growth so that the whole calf-crop is sold as weaning as feeder calves. You cannot have both: in other words, you can't have

your pie and eat it too! The same can be applied to the purchase of new heifers or cows. You need to select females that will potentially help improve the herd, even if it's a bit less than what a new bull can do.

When presenting more than one type of data for a particular trait, such as ratios and EPDs for

weaning weight, rank and use the data according to the accuracy with which future performance of offspring can be predicted. Give emphasis to the data in the following sequence:

1. EPD
2. Ratio within a contemporary group
3. An individual animal's actual records

Check It Out At Home!

Take a look at your cow herd and analyze where their weaknesses are and what traits you will want in a bull to help improve your herd.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

ACTIVITY #1

BULL SELECTION (JUDGING ACTIVITY)

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">– Mature Bovine Female Reproductive System - Anatomy worksheet– Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">– Pick 4 bulls at random from an AI company’s catalogue (use all one breed)– Provide the pictures to the members but not the genetic evaluations– Have them judge these bulls on appearance alone– After the have completed their placings and given reasons, provide the Genetic Evaluations and see if they would change their placing based on this information
REFLECT	<p>Learning Outcomes:</p> <p>To understand the importance of techniques needed for critical thinking skills. Members will be able to identify characteristics to look for and learn how to prioritize these characteristics.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">– Was this activity difficult or easy? Why?– What did you learn as you worked through this activity?– Why is it important to learn critical thinking skills?

ACTIVITY #2
GROUP OF HEREFORD BULLS

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">- Group of Hereford Bulls worksheet- Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">- Give each member a Group of Hereford Bulls worksheet- Explain the worksheet and have members answer the questions.- Review the worksheet and discuss each answer.
REFLECT	<p>Learning Outcomes:</p> <p>To understand the various selection traits to look for when choosing a bull for your herd.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Why is it important to be able to understand the various traits being sought after for the right bull for your herd?- Have you changed how you think about which bull is best for your herd?

ACTIVITY #2 GROUP OF HEREFORD BULLS

No.	Birth Date	Birth Weight EPD	Weaning Weight EPD	Yearling Weight EPD	Maternal Milk EPD
1	1/30/17	+0.1	+26.0	+35.0	+5.0
2	3/01/17	+4.9	+33.0	+59.0	+11.0
3	1/22/17	+5.3	+29.0	+38.0	-3.0
4	2/11/17	+4.0	+28.0	+40.0	0.0
	Breed Avg. EPD's	+3.0	+21.0	+33.8	+0.6

Above are the EPDs of a group of bulls that you have to choose from for your operation

1) Which of these bulls would be a good choice to use on yearling heifers?

2) Which would be more suitable for large frame mature cows?

3) Which of these bulls would increase weaning weights the most?

4) Which bull would you choose if increasing your Yearling weight was your only selection factor?

5) If you were trying to increase milk production in future generations in your cow herd which bulls would you consider using?

Saskvalley Yesterday (Shorthorn)

0200SP70704

Owners: Semex Alliance



Saskvalley Shadow 320Z	Saskvalley Navajo 153M
Sire: Saskvalley Wholesale 114W	Dam: Saskvalley Rose 43W
Saskvalley Victoria 53T	Uphill Rose 18S



	BORN	REG. #	TATTOO	BW	WW	YW	SC		
	28/04/2011	M476051	AEN 116Y	80 lbs	616 lbs	1000 lbs	39 cm		
ASA-W16	CE	BW	WW	YW	TM	CEM	RE	MB	FT
EPD	15	0.2	73	76	52	7	-0.18	0.14	-0.02
ACC	0.41	0.49	0.41	0.41	-	0.22	0.03	0.03	0.04
RANK	2%	20%	10%	30%	20%	10%	85%	15%	75%

AT HOME ACTIVITY

Study the genetic evaluations that accompany bulls in the various AI catalogues and online. Note the difference in traits measured for the various breeds .

DIGGING DEEPER

FOR SENIOR MEMBERS

Research what the term “heritability” means and compose a list of highly heritable traits and low heritability traits. Realize that selecting for some traits may be counterproductive. Meaning by choosing some traits you sacrifice others. This is sometimes referred to a “negative correlation” between traits.

SECTION 5D: FRAME SCORE AND ESTIMATING FINISH WEIGHT

SETTING OBJECTIVES

Being able to determine frame scores, estimated finished weights and average daily gain for beef cattle is an essential management tool every beef producer should be familiar with.

Suggested Lesson Outcomes

- To identify how to measure frame score of the 4-H project
- To estimate the finish weight of the 4-H project
- To be able to determine ADG of the 4-H project

ROLL CALLS

- What is a frame score?
- What does Finish Weight mean?
- What is average daily gain (ADG)?

SAMPLE MEETING AGENDA

Time: 1 hour 40 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Judging Activity	Activity #1 Build a Picture	30 min
Topic Information, Discussion & Activities	Topic Information Measuring hip height Determining Frame score Estimating Finish Weight Average Daily Gain Activity # 2 Average Daily Gain	30 min + Activities
At Home Activity	Frame Score	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

DETERMINING AND USING FRAME SCORE

Frame score is determined by the age and the hip height of the animal. With the frame score, the producer can better determine how best to feed the animal in the time that they have. The higher the frame score, the longer it will take to finish the animal or the larger it will be as a mature cow or bull.

Measuring Hip Height

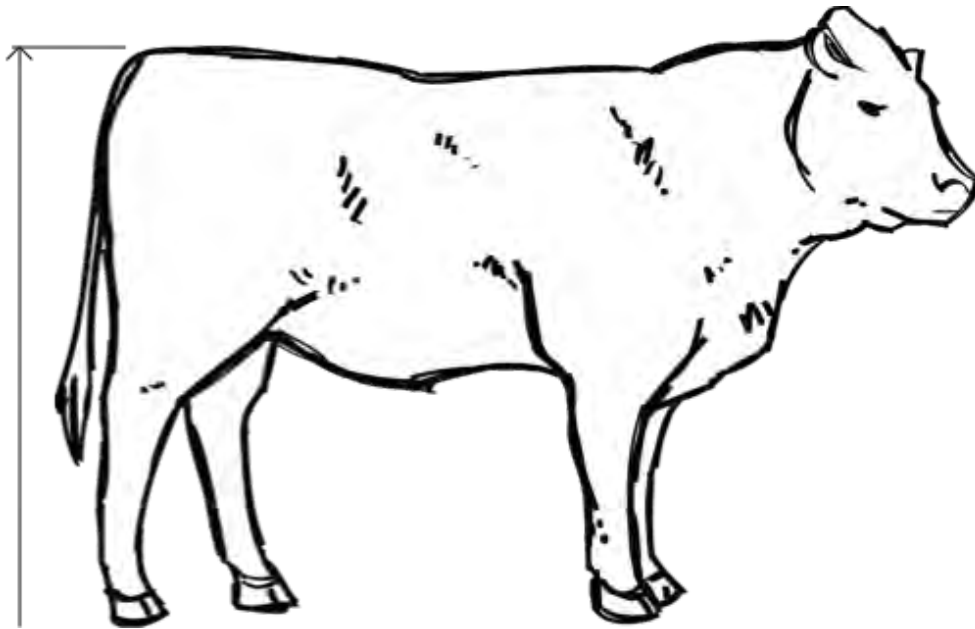


Photo Credit: 4-H Alberta

Ensuring that the animal is standing on a level surface, in inches, measure to the point directly over the hip bones. Make sure that the plane you are using at the hip is directly perpendicular to the measuring tape

FRAME SCORE FOR FEMALES AND MALES

Example: A heifer born on March 15th with a hip height measurement of 46.1 inches on October 15th will have a Frame Score of 6

Age (mo+1/4)	Frame Score for Heifers								
	1	2	3	4	5	6	7	8	9
5	33.1	35.1	37.2	39.3	41.3	43.4	45.5	47.5	49.6
6	34.1	36.2	38.2	40.3	42.3	44.4	46.5	48.5	50.6
7	35.1	37.1	39.2	41.2	43.3	45.3	47.4	49.4	51.5
8	36.0	38.0	40.1	42.1	44.1	46.2	48.2	50.2	52.3
9	36.8	38.9	40.9	42.9	44.9	47.0	49.0	51.0	53.0
10	37.6	39.6	41.6	43.7	45.7	47.7	49.7	51.7	53.8
11	38.3	40.3	42.3	44.3	46.4	48.4	50.4	52.4	54.4
12	39.0	41.0	43.0	45.0	47.0	49.0	51.0	53.0	55.0
13	39.6	41.6	43.6	45.1	47.5	49.5	51.5	53.5	55.5
14	40.1	42.1	44.1	46.1	48.0	50.0	52.0	54.0	56.0
15	40.6	42.6	44.5	46.5	48.5	50.5	52.4	54.4	56.4
16	41	43	44.9	46.9	48.9	50.8	52.8	54.8	56.7
17	41.4	43.3	45.3	47.2	49.2	51.1	53.1	55.1	57.0
18	41.7	43.6	45.6	47.5	49.5	51.4	53.4	55.3	57.3
19	41.9	43.9	45.8	47.7	49.7	51.6	53.6	55.5	57.4
20	42.1	44.1	46.0	47.9	49.8	51.8	53.7	55.6	57.6
21	42.3	44.2	46.1	48.0	50.0	51.9	53.8	55.7	57.7

Hip Height (Inches)

Age (Months)	Frame Score for Steers								
	1	2	3	4	5	6	7	8	9
5	33.5	35.5	37.5	39.5	41.6	43.6	45.6	47.7	49.7
6	34.8	36.8	38.8	40.8	42.9	44.9	46.9	48.9	51.0
7	36.0	38.0	40.0	42.1	44.1	46.1	48.1	50.1	52.2
8	37.2	39.2	41.2	43.2	45.2	47.2	49.3	51.3	53.3
9	38.2	40.2	42.3	44.3	46.3	48.3	50.3	52.3	54.3
10	39.2	41.2	43.3	45.3	47.3	49.3	51.3	53.3	55.3
11	40.2	42.2	44.2	46.2	48.2	50.2	52.2	54.2	56.2
12	41.0	43.0	45.0	47.0	49.0	51.0	53.0	55.0	57.0
13	41.8	43.8	45.8	47.8	49.8	51.8	53.8	55.8	57.7
14	42.5	44.5	46.5	48.5	50.4	52.4	54.4	56.4	58.4
15	43.1	45.1	47.1	49.1	51.1	53.0	55.5	57.0	59.0
16	43.6	45.6	47.6	49.6	51.6	53.6	55.6	57.5	59.5
17	44.1	46.1	48.1	50.1	52.0	54.0	56.0	58.0	60.0
18	44.5	46.5	48.5	50.5	52.4	54.4	56.4	58.4	60.3
19	44.9	46.8	48.8	50.8	52.7	54.7	56.7	58.7	60.6
20	45.1	47.1	49.1	51.0	53.0	55.0	56.9	58.9	60.9
21	45.3	47.3	49.2	51.2	53.2	55.1	57.1	59.1	61.0

Hip height (Inches)

Credit: 4-H Alberta

Example: A steer born on February 1st with a hip height measurement of 49.3 inches on October 1st will have a Frame Score of 7.

Check It Out At Home!

Using the chart that is appropriate for your beef animal(s), figure out it's frame score.

ESTIMATING FINISH WEIGHT

Frame Score is used to estimate the finished or mature weight at which the animal will be ready for market or breeding. After producers determine the frame score, they use this chart to estimate the finished weight:

Example: A steer with a Frame Score of 6 would have an estimated finished weight of 1250 pounds.

Frame Score	Finished Weight (estimated in pounds)
2	850
3	950
4	1050
5	1150
6	1250
7	1350
8	1450
9	1550

Credit: 4-H Alberta

Share It!

Once you have determined the frame score for your animal(s), share with the rest of the group what your animal(s) finished weight is.

AVERAGE DAILY GAIN

Once producers know the estimated finished weight of an animal, they can calculate the Average Daily Gain they need to achieve in order to reach a desired finished weight at the time they'd like to market or breed the animal.

Step 1

Target Weight 1250
 Current Weight - 650
 Weight to Gain 600

Target Weight or Estimated Finished Weight (pounds)

-

Current Weight or Weight at Weigh-In Day (pounds)

= Weight to Gain or Pounds needed to gain to reach Target Weight (pounds)

Step 2

5.5 months x 30 days
 165 Days

Months Until Desired Sale or Breeding Date

x

30 (days)

= Number of Days Until Desired Sale or Breeding Date

Reach Out!

Have a beef producer(s) come to the meeting to talk about the importance of average daily gain and what gain they look for a different stages of a beef animal's life. The beef producer could be cow-calf, backgrounder or feedlot.

Step 3

Weight to Gain 600
 Number of Days / 165
 3.64 pounds/day

Weight to Gain

÷

Number of Days Until Desired Sale or Breeding Date

= Average Daily Gain

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

Credit: 4-H Alberta

ACTIVITY #1 BUILDING A PICTURE (JUDGING ACTIVITY)

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">– Mature Bovine Female Reproductive System - Anatomy worksheet– Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">– Put four similar items on a tray or center of the table and cover the items.– Reveal the items to the group of members for approximately 30 seconds– Cover the items up again.– Have members write down distinguishing characteristics of each item, then ask them questions about the items.– Your questions might include:<ul style="list-style-type: none">Which item was:<ul style="list-style-type: none">a. Largest?b. Smallest?c. Was a particular colour?d. Most worn? <p>When giving oral reasons on a class of animals, judges will often ask the member questions after they have finished giving reasons.</p> <ul style="list-style-type: none">– Encourage members to always have a picture of the class in their minds. If they practice this now, when they have to give oral reasons in the future, it will be much easier for them. The only way to give oral reasons without notes is to keep that picture of the class in your mind. The easiest way to do this is to keep one distinguishing feature about each item or animal in your mind.
REFLECT	<p>Learning Outcomes:</p> <p>To teach judges the importance of creating a picture of a class in their mind and being able to use that picture when preparing and presenting reasons.</p>

APPLY

Processing Prompts:

- Was this activity difficult or easy? Why?
- How much more difficult would this activity have been if you were only given 15 seconds to look at the items?
- Why is it important to learn critical thinking skills?

ACTIVITY #2
AVERAGE DAILY GAIN

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">- Average Daily Gain worksheet- Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">- Give each member an Average Daily Gain worksheet- Explain the worksheet and have members work through the equations.- Review the worksheet and discuss the results.
REFLECT	<p>Learning Outcomes:</p> <p>To be able to learn the steps to determine frame scores, estimated finished weight and ADG for beef cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Why is it important to be able to determine frame scores, finished weights and ADG for beef cattle?- How do cattle of different breeds compare to your animal?

ACTIVITY #1
AVERAGE DAILY GAIN WORKSHEET

Work through the following exercise to determine the average daily gain needed to achieve a set end weight for your project.

Frame Score

Your steer calf or heifer calf’s age in months: a)

Current hip height of your steer calf or heifer calf in inches: b)

Referring to the appropriate Frame Score Chart, use the age in months (a.) and the hip height in inches (b.), to determine the frame score of your steer calf or heifer calf: c)

ESTIMATED FINISHED WEIGHT

Referring to the Estimated Finish Weight Chart, use the frame score (c.), to determine your steer calf or heifer calf’s approximate finished weight: d)

AVERAGE DAILY GAIN

Estimated Finished Weight d)

-

Current Weight of your steer or heifer e)

Weight to Gain f)

Months Until Desired Sale or Breeding Date g)

x

30 (days in a month) h)

Days Until Sale or Breeding Date i)

Weight to Gain f)

÷

Days Until Sale or Breeding Date i)

Average Daily Gain j)

Credit 4-H Alberta

AT HOME ACTIVITY #1

Measure the hip height of your 4-H project to determine its Frame Score.

DIGGING DEEPER FOR SENIOR MEMBERS

Complete the At Home Activity above. Use this to determine the Finished Weight and the Average Daily Gain required to achieve the desired finished weight.

MEETING 5E: BREEDING SEASON

SETTING OBJECTIVES

Cow-calf farms have many management decisions to make when thinking about the farm's breeding season. Members will be given the tools to create their own opinions and decisions about when and how long the breeding season should be as well as the how the cows are bred.

Suggested Lesson Outcomes

- To outline the basic requirements for breeding season
- To determine when breeding season should be
- Determine which method will fit into their home operations

ROLL CALLS

- What is the gestation period for a beef cow?
- When is the best time to calve your cows?
- Do you use Artificial Insemination on your farm?

SAMPLE MEETING AGENDA

Time: 2 hours 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Judging Activity	Judging Activity #1 Negatives to Positives	30 min
Topic Information, Discussion & Activities	Topic Information Natural vs AI Timing and Length of Breeding Season Activity #2 Determining a breeding Season	60 min + Activities
At Home Activity	Determining your farm's optimal breeding season	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

Several managerial practices increase productivity within cow-calf herds when they can be implemented economically and practically. These practices are mostly associated with reproduction, because improvements in herd fertility generally offer potential for increased profitability in cow-calf operations. They include a restricted breeding season, identification of the optimal calving season, a good heifer replacement program, heifer reproductive tract scoring, proper nutrition, good herd health, bull breeding soundness examinations, crossbreeding and maintaining good records.

NATURAL SERVICE VERSUS ARTIFICIAL INSEMINATION

Natural service involves the use of bulls to breed heifers and cows. Artificial Insemination, or AI, involves a technician using an instrument to deposit semen that has been collected from a bull, through the vagina and cervix and into the body of the uterus of the heifer or cow. Estrus synchronization is a method often used as part of an artificial insemination program.

Estrus Synchronization

Producers use estrus synchronization to cause groups of cycling heifers and cows to come into estrus and to ovulate at approximately the same time. It's a reproduction management tool that shortens, and helps producers to better manage, the breeding and calving seasons.

When deciding to naturally and/or artificially inseminate their cattle, producers need to think about the advantages and disadvantages of each method before making a decision that works best for their operation.

TIMING & LENGTH OF THE BREEDING SEASON

The gestation period for beef cattle is 283 days, approximately nine months. Therefore, producers determine the timing and the length of the breeding season based on what that will mean for the calving season.

Timing of Breeding Season

Producers may choose to calve in the Winter, Spring, Summer or Fall. The decision around the most suitable timing for the breeding season may be based on other farm/ranch commitments, production targets, weather trends and the availability of necessary resources and labour at the time of calving. Not one of the seasons works for all producers.

Reach Out!

Have an AI Technician come to speak at a meeting about their job. Find out what training they have, what kind of hours they work and what the rewards are of the job.

If possible, have the AI Technician do an artificial insemination demonstration.

Talk About It!

If you have cow-calf on your farm, what season does calving take place? Why did your farm choose that time of year?

Length of Breeding Season

A 60-90 day breeding season is the goal of many cow/calf producers, but a shorter breeding season lasting 45-60 days can offer producers a lot of advantages such as:

- To be able to identify cows that need to be culled due to lack of performance more easily.
- Being able to more effectively meet the nutrient requirements of the cow herd during each stage of reproduction, because all of the heifers and cows will be at a similar stage.
- Saving on time and labour required for breeding season and calving season management, because the seasons will be concentrated.
- Calves will be more uniform in age and weight, making calf management easier.
- Calves born earlier in the calving season are typically heavier at weaning than calves born late in the calving season.

Communicate It!

Can you think of any other advantages of a shorter breeding season that lasts 45 to 60 days?

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

ACTIVITY #1
NEGATIVES TO POSITIVES (JUDGING ACTIVITY)

<p>DO</p>	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">- Mature Bovine Female Reproductive System - Anatomy worksheet- Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">- Explain to members when judges give comments on a class they need to be comparative and positive. By positive we mean that they compare the strengths one animal has over another, rather than the weaknesses of an animal. If you are the animal placed in the lower spot, it is much easier to hear how one animal has some more desirable characteristics than yours does, rather than hear how bad your animal looks.- Distribute the worksheet with the weaknesses on to members and ask them to work in pairs to come up with ways to say the same thing in a more positive manner. You may have to work with members to explain the terms- Once they are finished the sheet, share it with the group.- Remind members that when they are giving reasons on a class, they should be talking about the strengths not the weaknesses.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To show members ways to give comments on a class of animals in a positive manner.</p>

APPLY

Processing Prompts:

- What was the biggest challenge when completing this activity? Why?
- Why is it important to learn critical thinking skills?

ACTIVITY #1 NEGATIVES TO POSITIVES (JUDGING ACTIVITY)

Turn the following negative statements to positive ones.

Example: Post legged becomes "More desirable set to rear legs"

1. Thick necked _____

2. Sickled Rear Legs _____

3. Pencil Gutted _____

4. Dip in their back _____

5. Excessive Waste _____

6. High pins _____

7. Short and dumpy _____

8. Poor rump _____

9. Weak over the loin _____

10. Poor Capacity _____

11. Lacks Femininity _____

12. Excessive Brisket _____

ACTIVITY #2

DETERMINE A BREEDING SEASON

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">- Determine a Breeding Season worksheet- Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">- Give each member a Determine a Breeding Season worksheet- Using the worksheet provided, answer the questions. Visit the website link provided for information to assist in completing the worksheet.- Review the worksheet and discuss the advantages and disadvantages of each season.
REFLECT	<p>Learning Outcomes:</p> <p>To be able to determine which season you think would work best for breeding beef cattle, given all of the factors that must be considered.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Did your findings surprise you?- Has the activity made you re-think when the best time for breeding cows might be?- Are there any other factors that should be considered when determining the best time to breed heifers/cows?

ACTIVITY SHEET # 1

DETERMINING A BREEDING SEASON

Reference: When Should I Calve My Cows?

<http://www.gov.mb.ca/agriculture/livestock/production/beef/when-should-i-calve-my-cows.html>

Instructions: Determining the timing of your breeding season and calving season is a major decision. Weigh your options carefully!

Winter Calving Season – January, February and March

- When would the breeding season need to take place?
- What would be some advantages of a winter calving season?
- What would be some disadvantages of a winter calving season?

Spring Calving Season – April and May

- When would the breeding season need to take place?
- What would be some advantages of a spring calving season?
- What would be some disadvantages of a spring calving season?

Summer Calving Season – June and July

- When would the breeding season need to take place?
- What would be some advantages of a summer calving season?
- What would be some disadvantages of a summer calving season?

Fall Calving Season – August, September and October

- When would the breeding season need to take place?
- What would be some advantages of a fall calving season?
- What would be some disadvantages of a fall calving season?

AT HOME ACTIVITY

Determine which breeding season would work best in your home herd. Take into consideration all of the information in the reference section, as well as your resources at your home operation.

DIGGING DEEPER FOR SENIOR MEMBERS

Determine and outline the various methods and protocols involved in estrus synchronization. Outline the various hormones used and the timing involved. Do a cost comparison for each method.

SECTION 5F: PREGNANCY CHECKING (DETERMINING IF THE FEMALE IS PREGNANT AND AT WHAT STAGE)

SETTING OBJECTIVES

Pregnancy checking beef cattle is an essential management tool on any cow-calf farm. Members will discover the various methods for doing pregnancy checks and why this task is so important.

Suggested Lesson Outcomes

- To Recognize the reasons for conducting a pregnancy check.
- Identify three possible methods of determining pregnancy in a beef female and be able to describe each method.
- Determine which method will fit into their home operations.

ROLL CALLS

- Do you think pregnancy checking is a valuable tool for the beef cow-calf producer?
- If you have cows at home do you pregnancy check them?
- When do you think is the best time to pregnancy check?

SAMPLE MEETING AGENDA

Time: 1 hour 35 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Judging Activity	Optional due to time limit	
Topic Information, Discussion & Activities	Topic Information Estrus Palpation Ultrasound Blood Tests Activity #1- Veterinary Demonstration Activity #2 Pregnancy Checking (True or False)	60 min + Activities
At Home Activity	Pregnancy Checks	
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

If estrus or standing heat cannot be detected within 17-24 days of being bred, you can generally assume that the cow or heifer is pregnant. But, many producers test their female animals for pregnancy after the breeding season.

One of the benefits of conducting pregnancy checks is finding out approximately when the calving season will be, which can help producers to make better management decisions, especially when it comes to developing a feeding and nutrition plan based on stage of gestation.

Producers can also use the information to identify fertility or health issues in the herd as well as any open cattle (heifers or cows that are not pregnant and cycle again), which will help to facilitate culling and marketing decision-making.

There are a few methods for pregnancy testing out there, with each method varying slightly in terms of who can conduct it, when it can be conducted, how much information you can get from the test, how accurate it can be and how long it takes to find out the results. The most common methods out there are:

- Palpation
- Ultrasound
- Blood or Milk Test

PALPATION

Pregnancy diagnosis by rectal palpation has been performed for decades in beef and dairy cattle. This of course involves an experienced person introducing their hand and arm into the rectum of the cow or heifer and physically feeling the fetus. A skillful palpator can diagnose pregnancy as early as 40 days of gestation and later. It is usually possible to determine the gestation length (or fetal age), although the variation in size of individual fetuses makes it somewhat more difficult as the fetus gets larger. In general, though, a veterinarian can do a decent job of determining the age of a fetus less than 4 months along. Rectal palpation is quick, requires no specialized equipment, gives instant results, and is the most economical of all methods. In addition, rectal palpation can help diagnose pathologic problems within the pelvis and abdomen.

ULTRASOUND

Ultrasound examination of the uterus has been employed for the past 15 years or so by veterinarians. Advances and availability in equipment has resulted in most veterinary clinics being able to offer this service. In this method, an ultrasound probe is inserted into the rectum for examination of the uterus. Ultrasound has the advantage of being able to determine sex of the fetus; however, there is a fairly narrow window in which this can be accomplished (between

Talk About It!

Discuss the benefits of conducting pregnancy checks on a beef herd. Why is this such an important management tool for a beef producer?

Reach Out!

Have a person experienced in palpation give a demonstration as to how they diagnose pregnancy in cattle.

55 and 70 days, in general). Ultrasound also has the advantage of being able to detect pregnancy earlier than palpation—as early as 28 days of gestation. Determining the age of the fetus is more accurately performed with ultrasound versus palpation, allowing cattle producers to differentiate between AI and bull bred pregnancies, and to group females by future calving dates. Ultrasound requires expensive equipment and considerable skill, and is more expensive than palpation. Certain operations, seedstock operations, for example, may find value in the ultrasound’s ability to obtain accurate ages and sexes of the calves about to be born.

BLOOD TESTS

The advantages of the blood test over palpation include being able to detect pregnancy a little sooner with better accuracy. It can be done quickly and easily, taking a blood sample from a vein under the tail, with less trauma to the animal. The BioPRYN bovine pregnancy test is very accurate on heifers, and on cows that are 90 or more days past calving. If checked too soon after calving, there will still be some PSPB (Pregnancy Specific Protein B) present in the bloodstream, which could result in a false positive. Currently there are over 50 labs that test blood for pregnancy in North America including two in Canada.

The producer can bleed the cows, using red-top tubes, then label and mail those tubes by courier or Canada Post. The samples don’t need to be kept cool — just wrapped in bubble wrap to protect them from breakage.

Reach Out!

Either have a veterinarian as a guest speaker or visit a veterinary clinic for a demonstration on how ultrasound works for detecting pregnancy in beef cattle.

Share It!

Has anyone in the club used Blood Tests on their farm as a method of pregnancy testing?

Is this a method that you are comfortable doing on your own?

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

ACTIVITY #1
VETERINARIAN DEMONSTRATION

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">– Veterinarian <p>Instructions:</p> <ul style="list-style-type: none">– Under the direction of a veterinarian, have members take a hands-on approach and try palpation and ultrasound on potentially pregnant cattle.
REFLECT	<p>Learning Outcomes:</p> <p>To be able to understand, in a hands-on activity, various methods of pregnancy detection in cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">– Was it difficult or easy to determine pregnancy in the cattle?– Did you feel comfortable doing this procedure? Or would you rather have someone else palpate or do ultrasound on your cattle?– Did anything surprise you when doing this activity?

**ACTIVITY #2
PREGNANCY CHECKING**

DO	<p>Time: 15 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">- Pregnancy Checking worksheet- Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">- Give each member a Pregnancy Checking worksheet- Explain the worksheet and have members answer the True/False questions.- Review the worksheet and discuss each answer.
REFLECT	<p>Learning Outcomes:</p> <p>To be comfortable with knowledge of various methods of checking for pregnancy in beef cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Why is it important to understand the various methods of checking for pregnancy in cattle?- Are there other reliable ways that members know of for checking for pregnancy?

ACTIVITY #2

PREGNANCY CHECKING

Answer the following questions from the reference material with a True or False answer

1. If estrus or standing heat cannot be detected within 17-24 days of being bred, you can generally assume that the cow or heifer is pregnant.
2. Pregnancy diagnosis by rectal palpation is a new technology.
3. One of the benefits of conducting pregnancy checks is: finding out approximately when the calving season will be.
4. A skillful palpator can diagnose pregnancy as early as 40 days of gestation and later.
5. The Palpation method can determine pregnancy earlier than ultrasound.
6. Ultrasound equipment is relatively inexpensive.
7. Blood sample taken to determine pregnancy does not need to be kept cool.

AT HOME ACTIVITY

Talk to a local cow-calf farmer and ask how they do pregnancy checks within their herd. Ask why they use the method they chose and if they are happy with the results. Ask if they would do anything different in the future.

DIGGING DEEPER FOR SENIOR MEMBERS

Further investigate the blood method of pregnancy testing. In your research determine how the test is chemically performed and what standards they are compared to.

ANSWERS TO ACTIVITY #2

1. True
2. False
3. True
4. True
5. False
6. False
7. True

SECTION 5G: CALVING SEASON

SETTING OBJECTIVES

One of the most important and busiest times of the year on a beef farm is calving season. Being prepared is a must! Members will begin to understand the complexities prior to, during and after calving.

Suggested Lesson Outcomes

- To encourage the member to prepare for calving season
- To be able to assemble a tool kit for calving
- To determine if and when to assist the cow during calving

ROLL CALLS

- When is the best time to calve out beef cows?
- What are some of the preparations you should do before calving season?
- What is the normal presentation of a calf as it is being born?

SAMPLE MEETING AGENDA

Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Judging Activity		10 min
Topic Information, Discussion & Activities	Topic Information Preparing for Calving Season Parturition and Calving Calf Presentation Calving Season Toolbox Caring for a Newborn Calf Activity #1 Calving Abnormalities	30 min + Activities
At Home Activity	Construct a Calving Season Toolbox	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

The busiest and most important time for producers is fast approaching. A successful calving season is an important kick off for the year. Without a live, healthy calf at foot, the production year for a brood cow unravels. As with most things, planning ahead makes calving season go better and as calving season goes, so does annual herd productivity and profit. Looking back, healthy calves beside every cow symbolize sound decisions around breeding, nutrition, and health management. Looking forward, calving season is a time to evaluate the cowherd and set it up for success through the next breeding season. Careful observation and keeping good notes through calving season captures information that is otherwise lost when memory is blunted by workload and lack of sleep. Have a notebook in your pocket and use it. Entries about calving difficulty, cow temperament, health issues and ideas for next year become reminders for improvement. Excessive birth weights and calving difficulties should be negligible if homework from one year to the next is completed. Notes will help assess whether or not assistance with calving cases was appropriate and if intervention was applied in a timely manner and handled using the right tool.

It's important for cows to maintain a body condition score (BCS) between 2.5 and 3.0 during the final trimester of pregnancy. Beginning now, body condition scores can be used to objectively judge nutritional status of the herd. Protein and energy intake can be adjusted as necessary. Good body condition promotes easier calving and higher-quality colostrum. To obtain optimum post-calving fertility, mature cows should calve with a body condition score of 2.5 to 3.0 and maintain it through the breeding season. Flushing, the practice of increasing energy levels for a couple of weeks before breeding season, will not enhance post-calving reproduction in thin cows (BCS 1.5 or less), but will improve the quantity of milk as cows start lactating. Research shows a five to 25 per cent reduction in adjusted 205-day weaning weight of calves from dams with body condition scores less than 2.0 at calving, or from nursing cows that lose condition after calving.

Check It Out and Share It!

Look at a herd of bred cows and determine what their BCS is. Share your observations with the group and see if everyone can agree on a BCS for each cow.

First-calf heifers should have a BCS of 3.0 to 3.5 before calving. Nutritional requirements for heifers need to take into consideration: continued growth, lactation and preparation for rebreeding. After calving, heifers won't add body condition so it is important they are in optimum condition at the time of calving.

The third trimester is time for producers to review vaccination protocols with their veterinarian. The timing of vaccination and choice of vaccines is critical.

Have a plan to manage cows onto and off of calving grounds. Calves from heifers face a greater risk of getting sick because heifers produce smaller amounts of lower-quality colostrum. As well, heifers have poorer mothering skills and are more likely to experience calving difficulty. Deal with these problems at the start of the calving season when things are the cleanest and the least harried.

Consider calving grounds as a controlled environment by limiting exposure to disease-causing organisms. Besides reducing the pathogen load, overcrowding, cold and dampness definitely affect the ability of calves to resist disease. Simple things like keeping the udders of nursing cows clean and the calf's environment dry and comfortable are important first steps in controlling scours.

The risk of developing disease is a function of challenge (dose of pathogens) and length of exposure. Crowded conditions increase the risk of disease on both counts and why the risk of getting scours and respiratory infections increases as calving season progresses.

The most important source of infectious organisms for calves is the adult cow. Most of the important pathogens for calves are normal inhabitants of the adult gut and the number of harmful bacteria, viruses and protozoa shed into the environment by cows increases exponentially during the calving season. Sick calves become additional multipliers to the countless billions of infectious organisms that blanket the calving environment. The multiplier effect means calves born later in the calving season are at greater risk for disease, or death.

Start clean; stay clean. Preventing scours is a matter of controlling pathogen numbers and maintaining resistance at a level higher than the risk of infection. It's a delicate balance. Temperature and moisture play a role. Mud and snow favour the buildup of pathogens. Cold can be a stressor that impairs the ability of calves to resist disease. Biosecurity in a sewer isn't achievable.

Many cow-calf operations have a nurse area for newborn calves, a place to dry them off, administer colostrum and maybe apply tags as needed. These same areas become a source of infection if they double as hospital pens for treating sick calves or cows. Producers should also try to avoid places like auction markets while cows are calving at the farm.

Be prepared to administer first aid as needed. Ensure first aid kits are readily available. Kits need to include a calf jack, obstetric chains, latex gloves, obstetrical sleeves, disinfectant soaps, esophageal feeders, clean syringes and needles. Access to appropriate antimicrobials, electrolytes and good lighting is important. Posted biosecurity protocols help inform staff and visitors about managing sick animals.

Colostrum control is a critical function through calving season. A calf needs to consume at least five per cent of its body weight in colostrum (i.e. a minimum of two litres for a 45-kg calf) within a few hours of birth. Calves that have failed to nurse within three hours should be given colostrum by esophageal

Judge It!

Compare various calving first aid kits and decide which one would be the most helpful in an emergency situation. Give ideas for the each of the kits to make them even more useful for a farmer to have on hand.

Research It!

If the cow isn't producing colostrum, what is the next best source of colostrum? What products are available on the commercial market to purchase as a colostrum supplement?

feeder. A variety of commercial colostrum supplements can be purchased at veterinary clinics, farm supply stores and feed dealers when colostrum supplies are low.

Do the dishes. Supplemental colostrum and electrolytes given to scouring calves will be much more effective if clean bottles, nipples and tubes are used. After each use, wash utensils using hot water (at least 50 C or 120 F) and bleach, or other sanitizing agents recommended by your veterinarian. Dry them properly.

Knowing what to expect helps. Traumatic injuries in calves are common. Crowded conditions increase the risk of calves being stepped on or crushed. Physical hazards like protruding nails, broken posts, loose wire, standing water and exposed electrical wires create danger zones for young calves. Calving grounds should be examined for potential hazards every year.

Gut infections, joint infections, intestinal accidents (including abomasal ulcers and rectal prolapse), navel infection, respiratory diseases (pneumonia, necrotic laryngitis, aspiration pneumonia), neurologic conditions (brain infections, selenium deficiency, trauma) and sudden death round out the syndromes that represent over 90 per cent of conditions observed in young calves.

Calves should be evaluated frequently during the first several hours after being born. Lack of vigor and unresponsiveness are cardinal signs of problems.

Minimizing the risk of infectious disease in the young calf is still the biggest challenge for most cow-calf producers, while non-infectious problems cause most of the losses in the first two to three days. Things like dystocia, hypothermia (low body temperature) and hypoglycemia (low blood sugar) increase the risk of calf death from infectious disease four- to eightfold. Acquired infections after birth are primarily a numbers game. Even the strongest calf can succumb to infections in a crowded, dirty calving environment. The inventory of “bad bugs” steadily increases during the span of a calving season unless care is taken to create space and clean ground.

WHAT SHOULD BE IN A CALVING SEASON TOOLBOX:

- obstetrical chains and handles or straps
- disposable gloves
- clean pail and cleaning brush
- disinfectant
- colostrum (either from a cow or powdered version)
- vaccinations (e.g. Calf Guard)
- injectable vitamins (A&D and E selenium)

- iodine to treat navel
- esophageal feeder or milk bottle
- whatever else you deem useful

PARTURITION OR CALVING

Regular observation during the calving season is a must. Producers often separate their heifers and cows, as heifers are more likely to need assistance during calving and therefore should be monitored closely.

Signs that indicate that the beginning of calving season is near:

- Udder fills with milk.
- Vulva relaxes and swells, called springing.
- Cervical plug is lost.
- Signs that parturition or calving is going to occur within the next 24 hours or so:
- Relaxation of the pelvic ligaments and
- Behaviours such as isolating herself or not eating.

The three stages of parturition, or calving, are:

1. This first stage is the dilation or opening of the cervix, vagina and vulva. This stage may go completely unnoticed, but at the end of this stage the cow or heifer may raise or switch their tail and there may be an increased mucous discharge from the vulva. She may also isolate herself or stop eating.
2. The second stage has officially begun when you can see the water sac hanging from the vulva, and it ends once the newborn calf has been delivered. The heifer or cow usually lies down during this stage.
3. In the third stage the placenta is shed.

Experience It!

If you are lucky enough to have a cow calving during a meeting (and the cow is mature and docile), quietly observe what is happening.

If a producer thinks that the heifer or cow may be having dystocia, or calving difficulty, a good rule of thumb is that if a heifer or cow has been actively labouring but has made no progress, she may need help.

If a producer decides to intervene with the calving process, they must remember that safety and cleanliness are of utmost importance. Using a gentle touch, many producers determine whether

the calf's presentation is normal before they do anything. It's important that producers know their limitations and contact their veterinarian if dealing with calving difficulty.

Reach Out!

Have a veterinarian as a guest speaker to speak about dystocia (difficult calving) in beef cattle.

CALF PRESENTATION DURING CALVING

Figure 1 is a diagram of a normal presentation. As you can see, the calf is right side up and facing forward with its head and both front legs extending out towards the vulva. All other presentations are considered abnormal.



Figure 1: Anterior presentation



Figure 2: Breech presentation



Figure 3: Head turned sideways



Figure 4: One or more forelegs back



Figure 5 Upside down anterior presentation



Figure 6: Head Down

Credit: 4-H Alberta

CARING FOR A NEWBORN CALF

Colostrum is critical to the development of the newborn calf's immune system because it contains the antibodies necessary to protect the calf from disease. Calves should receive colostrum as soon as possible following birth.

Calves that aren't able to nurse should be given 5-6 % of their body weight in colostrum or commercial colostrum supplements within six hours of birth and the same amount again at 12 hours.

Producers should look over and keep a close eye on heifers, cows and calves following calving. It's important that heifers and cows to recover well from pregnancy and calving so that they return to estrus, and for calves to be strong and healthy.

Share It!

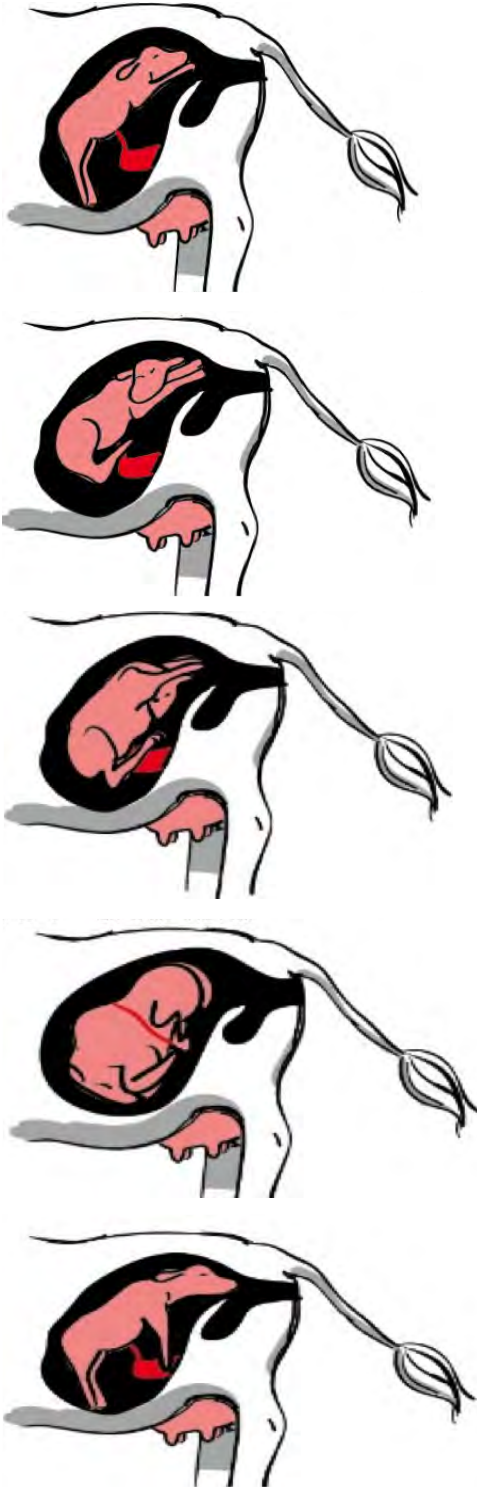
Do you have any experiences helping with a difficult calving? Why was it a difficult calving and what was done to try and calve out a live calf?

ACTIVITY #1 CALVING ABNORMALITIES

DO	<p>Time: 15 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none">– Calving Abnormalities worksheet– Writing utensil <p>Instructions:</p> <ul style="list-style-type: none">– Give each member a Calving Abnormalities worksheet– Explain the worksheet and have members circle and name the abnormal presentations.– Review the worksheet and discuss what each of the presentations.
REFLECT	<p>Learning Outcomes:</p> <p>To be able to identify abnormal calving presentations in cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">– Why is it important to be able to identify whether or not the calf's presentation in the birth canal is normal or abnormal?– Have you seen any calves that have presented themselves in any of these ways during calving?

ACTIVITY #1 CALVING ABNORMALITIES

Instructions: Circle and name the abnormal presentations.



Credit: 4-H Alberta

AT HOME ACTIVITY

Gather together all of the items you would need to have available at calving season. Ideally they should be in some form of easy to carry toolbox. If not available just having them accessible is good.

DIGGING DEEPER FOR SENIOR MEMBERS

Do research on the different types of illnesses or accidents that may happen during or after calving the heifer as outlined in the reference material above. For example : rectal prolapse, navel infection, gut infection, selenium deficiency. Pick three and describe them and how these can be avoided.

DOLLARS AND CENTS



SECTION 6A: RECORD KEEPING

SETTING OBJECTIVES:

To be successful in any business, good record keeping is essential. There are many different types of records that can and should be kept for a beef operation. Members will learn what these records are why they are so important.

Suggested Lesson Outcomes

- To understand why good record keeping is important
- To realize the various types of records that can be kept on a beef farm
- To learn where and how to keep good records

ROLL CALLS

- What is one record that should be kept on a beef farm?
- Name one reason good record keeping is important.
- Do you keep records for something (not necessarily farm related)? If so, what it is and why do you keep these records?

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Why Keep Records Where and How Do You Keep Farm Records	30 min + Activities
At Home Activities	Project Animal Records Online Auction Sale Reports	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

WHY KEEP RECORDS?

Records you keep on your farm might be for production, financial, or personal reasons. Some of these records might be:

- birth weights
- vaccinations
- weaning weights
- date of birth
- show winnings
- date and age castrated
- health problems

Good records help you to know many things about your farm and its animals including:

- good and poor mothers
- identification of your animals
- healthy cow families
- income and expenses
- overall herd health

Today, the agriculture industry is very complex. There are many choices that producers have to make:

- Which breed do I choose?
- Which bull do I buy or use?
- Do I choose purebred or crossbred?
- Do I choose cow-calf, finishing? Custom feeding?
- Do I cull or keep, expand or cut back?

By keeping accurate records, you will have the information you need to make informed decisions about your operation and its future. In 4-H, we ask that you keep detailed records on your project animal(s). By doing this, we hope that you will realize how important records are.

PEDIGREES

All animals and people have a history. They have mothers, fathers, daughters, sisters, etc. These things are often written down, making a pedigree. A pedigree is a written ancestry or history.

REGISTRATION

This is the official recording of purebred animals. Purebred animals have only one breed in their pedigree.

PRODUCTION RECORDS

Production records are one of the most important you should keep in your beef operation. Identification of your animals is the first step to good record keeping. Identification of your cattle by ear tagging means you can always identify each of your animals. Cattle are produced under conditions (housing, feed, labour) which often vary from farm to farm. Therefore, it is important that you be able to identify animals suitable for your operation.

PERFORMANCE RECORDS ON BEEF CATTLE

This involves keeping records on the traits that affect the profits on your farm. This means that you can then compare the animals to other animals of the same age and conditions in the herd.

Some of the performance traits you can record are:

- calving percentage (percentage of your cattle who produce a live calf)
- calving interval (length of the time between birth of the calf and birth of its next calf)
- length of gestation (time from successful breeding to calving)
- cow defects or abnormalities
- calving ease
- calf condition at birth
- birth weight
- growth traits up to 18 months of age
- any other information you feel is important

Performance records on an animal are most valuable when you use them to compare animals - animals which are the same age, have had performance measured at the same location and under the same management conditions (nutrition, health, etc.).

Research It!

How are purebred beef cattle registered in Canada? Choose a breed and find out where to register that particular breed. Find out what form(s) must be filled out, what information you will need to fill out the form(s) and what type of identification is required for the breed you choose.

An animal's performance is determined by:

- its genetic composition - half of which is inherited from the dam and half from the sire
- the environment (health, climate, nutrition, care)

WEANING WEIGHT can be used to evaluate the differences in milk production between cows and the genetic potential for growth of the calves. Usually, calves in a group are all weaned and weighed the same day. Therefore, they will all have slightly different ages. To allow for this, weaning weights are adjusted to a 205 day weaning weight.

$$205 \text{ day weaning wt} = [(actual \text{ weaning wt} - birth \text{ wt}) / age \text{ of calf in days}] \times 205 + birth \text{ wt}$$

The age of the dam affects the milk production and also the weaning weight of the calf.

Therefore, you may need to adjust the 205 day weaning weight to account for this. Adjust the 205 day weaning weight as follows:

If the dam is this old at the time of the birth of her calf:	Add this weight to the 205 day weaning weight:	Add this weight to the 205 day weaning weight:
	Male Calves	Female Calves
2 or 21-33 months	27kg	24kg
3 (34-46 months)	18kg	16kg
4 (47-59 months)	9kg	8kg
5-10 (60 to 128 months)	0kg	0kg
10+ (over 128 months)	9kg	8kg

Credit: B.C. 4-H Beef Member Manual

These adjusted 205 day weaning weights can now be used to compare calves within your groups. Calves with higher adjusted 205 day weaning weights will be those which have the genetic potential for optimum growth in your herd. The larger the group size, the more valuable your comparisons will be.

USING BEEF PERFORMANCE RECORDS

Productivity and profitability of beef production can be improved by using performance records. You can then identify and cull the lower producing animals and concentrate on breeding using the top quality animals.

Cattle are produced under conditions which vary greatly from one farm to the next. Housing, feed, labour and marketing are determined by the individual producer. Because the conditions are so variable, each producer must determine which cattle perform best under his/her farm conditions. Performance programs attempt to eliminate the environmental influences by comparing animals which raised under the same conditions. By doing this, genetically superior and inferior animals can be accurately identified.

Beef herd improvement programs often include this information:

- weaning index (index value is determined for each animal in the group; average is 100 and more desirable animals have higher indexes, less desirable have lower indexes)
- gain index
- composite index
- birth weight
- calving ease
- adjusted weaning and yearling weights
- calving interval

These performance evaluation programs vary for bulls, heifers, steers and commercial producers. Each producer should use the system which is best suited to his/her individual needs.

FINANCIAL RECORDS

These are an important part of any farm operation. They should include the costs of everything from computer and office expenses to feed, farm equipment, land rental and livestock purchases. Good farm records will make it easier for you to complete income tax returns. They can also help you make your decisions about future changes and/or improvements to the farm.

MEDICATION RECORDS

These records are vital when raising cattle. The date, name of medication, how much was given and the tag number of the animal must all be recorded. This is covered in more detail in the Herd Health section.

WHERE AND HOW DO YOU KEEP FARM RECORDS?

It is important to keep your farm records in a way which works for you and your operation. On a small operation, records can be accurately and completely kept by hand. But, many small operations and almost all larger operations find computer programs more useful.

No matter how you keep your records, it is important for you to decide:

WHERE you will keep your books and important farm information. It is important to keep your information organized and all together in a place where you can easily access it (office, desk, filing cabinet).

Reach Out!

Invite an accountant or bank manager who specializes in farm accounts. Ask what they suggest for best practices when keeping financial records for a farm operation.

Do It!

List as many things as possible that can be recorded on a farm.

WHEN you will update your records. One farmer routinely records all of his information in his computer every Sunday afternoon. During the week, he jots notes in a small book he carries in his pocket.

WHO will record the information. If more than one person is recording, it is important that both or all of you do it the same way.

HOW you will use your records. Will you use them to make farm decisions or just for income tax purposes?

WHAT information you want to be able to get from your records. You can use your information and prices to find out profit per animal, how much you can afford to spend per calf purchased next season or almost anything else you want to know. Decide in advance how you want to use the information and store it in a form which you can use.

WHY your records are valuable to you. A farm is a business and good farm records are one of your most valuable assets.

Talk About It!

Using your own farm or a neighbour's farm, tell everyone a bit about the farm. Answer the questions: Where? When? How? What? Why?

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY #1

Take a look at the records for your project animal. If someone else were to read your animal's records, would it give a complete story about your animal? Insure that your animal's records are complete.

AT HOME ACTIVITY #2

Look up an auction sale report online for finished beef cattle. Figure out how much the farmer received for the animal. Then list all of the costs the farmer would have had in order to raise the animal if the farmer had the animal from birth to sale date.

OR

Look up the Beef Farmers' of Ontario Daily Market Report at: <http://www.ontariobeef.com/markets/about-market-info.aspx> and figure out the price a farmer would receive for a finished animal. Then proceed to list all of the costs for raising the animal.

DIGGING DEEPER FOR SENIOR MEMBERS

Beef Herd Improvement Programs can include a variety of different performance evaluation markers. If possible, interview a beef producer that is willing to discuss and share their records. Find out why they chose to record certain evaluation markers. From this, create a list of evaluation markers that you would want to keep for your farm.

SECTION 6B: HISTORY OF THE BEEF INDUSTRY IN CANADA

SETTING OBJECTIVES:

To truly understand the beef industry today, members need to understand how the beef industry in Canada has evolved, grown and changed.

Suggested Lesson Outcomes

- To learn about the history of the beef industry in Canada
- To understand that Beef Farmers of Ontario is the organization that is the advocate and unified voice for Ontario beef producers

ROLL CALLS

- Name one reason settlers would want to raise beef cattle in Canada.
- Why is it important to have an industry organization that advocates for the beef industry?
- Name a farming statistic that Canadian beef producers can be proud of.

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information History of the Canadian Beef Industry The Canadian Beef Industry Today	30 min + Activities
At Home Activity	Beef Cattle Numbers in Your Area	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

HISTORY OF THE CANADIAN BEEF INDUSTRY

The origins of beef cattle farming in Canada can be traced back to the import of dual-purpose cattle breeds as live sources of food for French and British fur trading posts. By the 17th century, cattle were raised as a source of draft power, food (dairy and meat) and hides by the French-speaking habitants on mixed farms along the St. Lawrence Valley and the Bay of Fundy. Later, British settlers used cattle for the same purposes in the present-day Maritimes and Southern Ontario. Cattle were one of the mainstays of mixed farming that spread across the country with rural settlement and ranching became particularly important in the rangelands of Western Canada.

1940's-50's

- The cattle feeding industry becomes part of the supply chain. Finishing efficiencies and a more consistent beef product is achieved.
- Marketplace is growing.

1970's-80's

- Major processing plants are built.
- Packing industry evolves from carcass to boxed beef production.
- Transportation and logistical improvements allows industry to meet global market demand.

Research It!

Where were the major processing plants built in Canada in the 1970's and 1980's? Why do you think these spots were chosen?

1990's-2000's

- Radio frequency identification and genetic technologies are adopted.
- Improvements to pasture management systems and herd health practices are made.

2010's

- There are approximately 3.8 million beef cows in Canada. 236,000 of these cows reside on farms in Ontario.
- There are approximately 68,000 farms and ranches with beef cattle in Canada.
- Around 60% of those cattle farms or ranches have less than 50 cows.
- The average number of head per beef farm or ranch in Canada is 147, in Ontario it is 88.
- There are nearly 2.7 billion pounds of beef produced in Canada per year.
- Western Canada finishes 75% of all fed cattle in Canada.
- Producing 1.8% of the world's beef supply, Canada is the 11th largest beef producing

nation in the world.

- Canadian's are collectively consuming almost 900,000 tonnes of beef per year, or about 39 pounds per person!
- Canada is the 6th largest beef exporter in the world, excluding live cattle exports.
- Canada exports approximately 45% of total beef and cattle produced in the nation, mostly to the United States.
- The Canadian beef industry contributes over \$30 billion dollars per year to Canada's economy.
- The Canadian beef industry also creates over 200,000 full-time equivalent jobs directly or indirectly linked to the beef industry supply chain.

THE CANADIAN BEEF INDUSTRY – TODAY

The Canadian Beef Industry is over 300 years old and today, it contributes significantly to the Canadian economy. It's a leader in industry research, innovation and marketing. Canada's natural environment is well suited to cattle production. We have a cooler climate that doesn't limit the selection of breeds to those which can tolerate high heat conditions and there's an abundance of fresh water, wide open spaces as well as access to high quality feed.

HISTORY OF THE BEEF FARMERS OF ONTARIO ORGANIZATION



forward sustainably and profitably. The Association is involved in a wide range of issues and initiatives that are important to all stakeholders. These include industry sustainability, market development, animal health and care, environment, and food safety. In addition, BFO works closely with other sectors of the agriculture and food industries on areas of mutual concern.

For over fifty years the Beef Farmers of Ontario (BFO) has been a tough and credible advocate and unified voice for the province's 19,000 beef farmers, representing all sectors of the industry. BFO is the leading organization in Ontario working with beef farmers to develop and support landmark achievements that move the province's beef industry

Reach Out!

Invite someone who has many years of experience in the beef industry to talk about how the beef industry has changed since they first started.

Check It Out!

Visit the Beef Farmers of Ontario website for the latest news about the beef industry in Ontario.
<http://www.ontariobeef.com>

BFO is an Association deep rooted in history. The Association was founded in 1962 as the Ontario Beef Improvement Association (OBIA) and was first established to address the need for a unified voice for Ontario's beef industry. Later, in 1976, with growing concern to become a stronger lobby organization with government, and to align its name with the Canadian Cattlemen's Association, the Association transformed to become the Ontario Cattlemen's Association (OCA), a name that was sustained for 37 years.

Most recently, in 2013, the organization transitioned to become the Beef Farmers of Ontario to address the changing industry environment and to enhance its visibility and strength with valued stakeholders.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

Find out how many beef cattle are in the area where you live. Check out the statistics provided by the Ontario Ministry of Agriculture, Food & Rural Affairs found at: <http://www.omafra.gov.on.ca/english/stats/livestock/index.html>

DIGGING DEEPER FOR SENIOR MEMBERS

Early Breeds of Cattle – many breeds of cattle have been introduced to the North American beef industry in the past 50 to 100 years. Find out what breeds of cattle were raised in Canada (and in Ontario if possible) in the 1700's and 1800's.

SECTION 6C: CUTS OF MEAT

SETTING OBJECTIVES:

There are many cuts of meat from a beef carcass. To be able to talk to the consumer about the variety of options consumers have when purchasing beef products, members need to have a good understanding of what the cuts of beef are and the best use for each of these cuts.

Suggested Lesson Outcomes

- To be able to identify cuts of beef.
- To understand which cuts of beef are more desirable to the consumer.
- To gain an appreciation for the variety of cuts that come from a beef carcass.

ROLL CALLS

- What is your favourite cut of beef to eat? Least favourite?
- What is your favourite type of beef to cook on the barbeque?
- Name a type of beef steak.

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Cuts of Meat Activity #1 Cuts of Meat	30 min + Activities
At Home Activity	Grocery Store Flyers	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

CUTS OF MEAT

Consumers are drawn to different cuts of meat.

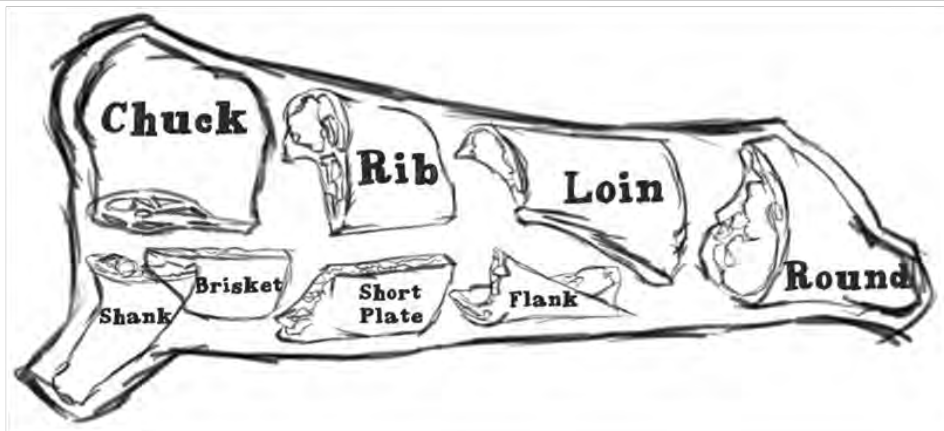


Diagram credit: 4-H Alberta

COMMON CUTS OF MEAT

No matter how you slice it, beef is a staple on menus across Canada. Some cuts are more commonly purchased, prepared and served than other cuts of meat. The 'Tenderness Rule of Thumb' is:

The farther a cut is from hoof, horn and hip the more tender the meat. BUT less tender cuts often have more flavour!

There is a lot to choose from when buying Canadian beef, with cuts that slow-simmer or others that are ready in minutes. Whatever your schedule, beef's got a cut to fit!

Visit <https://canadabeef.ca/cuts-by-colour/> for an interactive Guide to the most common cuts from each of the areas

Experience It!

Visit a butcher shop to see first-hand what cuts of beef are available. Find out what type of beef animals the butcher shop sources and why they process these type of animals.

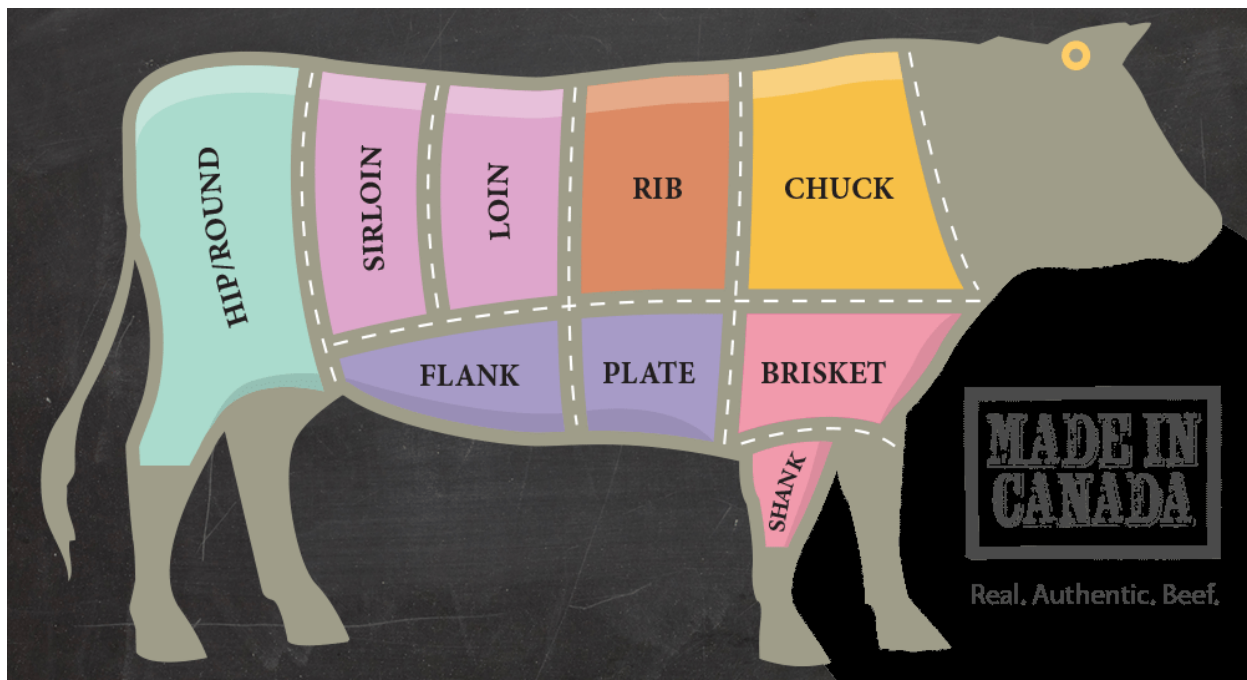


Photo credit: Canada Beef <https://canadabeef.ca/cuts-by-colour/>

pictured on the beef animal. The guide provides information about tenderness, taste, suggested uses and tips for cooking each particular cut of meat.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about beef animal digestion through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

Check It Out!

Visit a grocery store and look at the various cuts of meat offered for sale. Look at the prices. Do the prices reflect the type of cut?

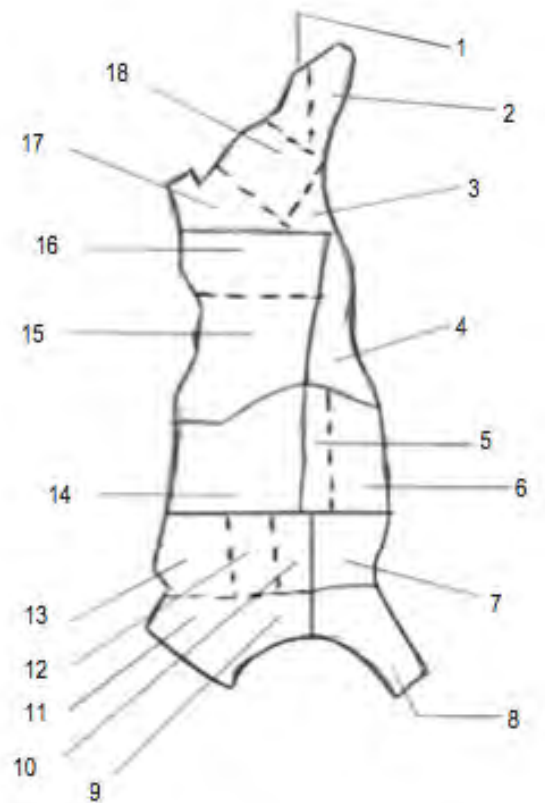
**ACTIVITY #1
CUTS OF MEAT**

<p>DO</p>	<p>Time: 20 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> - Cuts of Meat worksheet - Writing utensil <p>Instructions:</p> <ul style="list-style-type: none"> - Give each member a Cuts of Meat worksheet - Explain the worksheet and have members match each cut of meat to the location on the carcass that it comes from. - Review the worksheet and discuss each cut of meat, which ones are more desirable and, if comfortable, discuss how each cut of meat is best cooked.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To allow members to identify various cuts of meat on a beef animal. Once members know about various cuts of meat, they will have a better understanding of which cuts are more desirable to the consumer, why cattle are needed in the neck area (see Herd Health section for more detailed information) as well as why certain cattle make better beef animals.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Why is it important to know and understand cuts of meat on a beef animal? - Was it easy or hard to fill out the worksheet? - Which area of the animal do you think the best cuts of meat come from? - How would you best prepare and cook each cut of meat?

ACTIVITY #1 WORKSHEET

CUTS OF MEAT

Match each cut of meat to the location on the carcass that it comes from.



___ Sirloin roast or steak,
Ribeye steak

___ Heel of round

___ Chuck short rib

___ Plate

___ Stewing Beef (Shoulder)

___ Short ribs

___ Shank

___ Inside or outside round
steak or roast, eye of
round roast or steak

___ Shank

___ Brisket

___ T-bone
Porterhouse
Tenderloin
Striploin
Wing steak

___ Blade roast or
Steak neck

___ Sirloin tip roast
or steak

___ Flank steak

___ Neck

___ Rump roast

___ Sirloin steak

___ Cross rib

Credit: 4-H Alberta

AT HOME ACTIVITY

Look at the weekly flyers. See what cuts of beef are on sale at various grocery stores. Identify which area of the beef carcass each cut of meat came from.

DIGGING DEEPER FOR SENIOR MEMBERS

Any cut of beef can be tasty if prepared correctly. Choose a cut of beef and research how to best prepare the cut. Once you think you are comfortable with how to prepare it, purchase the cut of beef, making sure to keep cost in mind. Prepare and serve the cut of beef to your family or to your 4-H club at the next meeting. Prepare a short survey (can be written or verbal) to gather feedback about the recipe you tried.

SECTION 6D: BEEF GRADING SYSTEM

SETTING OBJECTIVES:

The grading of beef carcasses in Canada is an important step in delivering consistent beef products to consumers. Grading places carcasses into uniform groups of similar quality. The information collected through the grading process is used by beef producers in making marketing and production decisions.

Suggested Lesson Outcomes

- To understand what a beef carcass is.
- To be able to identify the various grades in Canada's beef grading system
- To see the difference between Canadian and American beef grading systems.
- To be introduced to new beef grading technology.

ROLL CALLS

- Name a grade that a beef carcass could receive.
- Why are beef carcasses graded?
- Name a grade for beef cattle that is used in the United States and not in Canada.

SAMPLE MEETING AGENDA Time: 1 hour 20 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information What is Considered a Beef Carcass? Beef Grading in Canada Yield Grade U.S. Grade Equivalency Ontario Corn Fed Beef Program Beef Grading Advancements	40 min + Activities
At Home Activity	How Feed Can Affect Meat Quality	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

WHAT IS CONSIDERED A BEEF CARCASS?

As indicated in Canada's Livestock and Poultry Carcass Grading Regulations, 'beef carcass' means the carcass of a slaughtered bovine animal that is produced for beef and has had the following removed, namely:

- the hide
- that portion of the head and neck forward of the first cervical vertebra
- that portion of the foreshank below the carpal (knee) joint and that portion of the hindshank below the tarsal (hock) joint
- the respiratory, digestive, reproductive and urinary systems and the thoracic and abdominal organs
- the membranous portion of the diaphragm and the pillar of the diaphragm
- the spinal cord
- the kidney fat, pelvic fat, heart fat and scrotal or udder fat
- the tail posterior to the first coccygeal vertebra
- any portion of the carcass the removal of which is required for pathological reasons under the Meat Inspection Regulations, 1990

HOW CANADIAN BEEF IS GRADED

The Canadian beef grading system follows standards set by the Government of Canada based on industry and government recommendations. The Canadian Beef Grading Agency (CBGA), a private, non-profit corporation, is accredited by the Canadian Food Inspection Agency to deliver grading services for beef in Canada. Trained graders visually assess the whole carcass based on several criteria and assign a grade.

Beef Grading in Canada

It is important for beef producers to understand the grading system because carcasses with top quality grades are sold at a premium and the information collected from the grading process can be used to improve production and marketing techniques.

Grading gives consumers a consistent way of selecting beef and therefore greater consistency and predictability in the eating quality of specific grades of beef. Beef grading is overseen by the Canadian Beef Grading Agency and is conducted by certified graders after a carcass has been inspected and approved for health and safety standards and bears a federal or provincial meat inspection legend or stamp.

The grader assesses a carcass based on several criteria influencing carcass quality and the lean yield.

Research It!

Find out what kind of training that trained beef graders receive from the Canadian Beef Grading Agency.

Quality – Predicted tenderness, juiciness, customer acceptability and shelf life are assessed based on maturity (age), sex, conformation (muscling), fat (colour, texture and cover) and meat (colour, texture and marbling). The assessment of marbling is based on the average amount, size and distribution of fat particles or deposits in the rib eye.

Yield – Carcasses qualifying for Canada Prime or any of the Canada A grades are also assessed for an estimation of lean meat yield. This is done by graders using a yield ruler to determine the rib-eye size and fat class between the 12th and 13th ribs.

Each of the characteristics assessed while grading has an influence on quality.

- **Maturity.** Affects tenderness. Carcasses are categorized as youthful or mature.
- **Sex.** Pronounced masculinity affects meat colour and palatability.
- **Muscling.** Meat yield is influenced by the degree of muscling.
- **Fat.** Colour and texture of fat influence consumer acceptability whereas fat cover affects yield.
- **Meat.** Marbling affects eating quality for juiciness and tenderness. Colour and texture influence consumer acceptability.

Look It Up!

Look through grocery store flyers, or visit a grocery store, to view the grades on various cuts of beef. When looking at the grades, determine if the beef is Canadian, American or from another country.

The grades that all feedlots feeding youthful cattle strive for is Canada A, Canada AA, Canada AAA and Canada Prime with a lean meat yield of around 60%.

This chart shows what characteristics are required for many of the quality grades.

The Quality Grades						
Grade	Maturity (Age)	Muscling	Rib Eye Muscle	Marbling	Fat Colour & Texture	Fat Measure
Canada Prime	Youthful	Good to Excellent with some deficiencies	Firm, Bright Red	Slightly Abundant	Firm, White or Amber	2mm or more
Canada A, AA, AAA	Youthful	Good to Excellent with some deficiencies	Firm, Bright Red	A-Trace AA-Slight AAA-Small	Firm, White or Amber	2mm or more
B1	Youthful	Good to Excellent with some deficiencies	Firm, Bright Red	No requirement	Firm, White or Amber	Less than 2mm
B2	Youthful	Deficient to Excellent	Bright Red	No requirement	Yellow	No requirement
B3	Youthful	Deficient to Good	Bright Red	No requirement	White or Amber	No requirement
B4	Youthful	Deficient to Excellent	Dark Red	No requirement	No requirement	No requirement

Chart courtesy of 4-H Alberta

Canada Prime

The highest marbled quality carcasses are given the 'Canada Prime' grade. Canada Prime represents carcasses with at least "slightly abundant" marbling. In 2012, the Canada Prime grade represented 1.1% of all graded beef from fed slaughter cattle in Canada.

'A' Grades

Canada 'A' grades (A, AA, AAA) are also high quality grades, representing increasing degrees of marbling from Canada A to AAA respectively. The segregation into different marbling ranges permits consumers, retail, and food service options in fat content. In 2012, the Canada A, AA and AAA grades together represented 97.1% of all graded beef from fed slaughter cattle in Canada.

'B' Grades

The 'B' grades are for youthful carcasses that fail to meet one or more of the quality requirements of the 'A' grades. In 2012, 'B' grades represented 1.8% of all graded beef from fed slaughter cattle in Canada. Beef with 'B' grades may be prevalent in fast food service.

Carcasses graded as 'B4' are called dark cutters. They are visually unappealing and have a higher pH than typical beef. Beef from dark cutters is often used in further processed products.

'D' Grades

The 'D' grades are applied to carcasses which are not youthful. They are typically given to carcasses from cows and represented 13.2% of the total graded cattle in Canada in 2012. Beef given a 'D' grade is typically used for ground beef and further processed products with the exception of the D1 grade, where whole muscle cuts may be used in low cost food service enterprises.

'E' Grades

The 'E' grade is reserved for mature bulls or youthful bull carcasses showing pronounced masculinity. This grade represented 0.5% of the total graded cattle population in Canada in 2012. These carcasses typically go into further processed products.

YIELD GRADE

When a carcass qualifies for Canada Prime or any of the Canada 'A' grades, a prediction of carcass lean yield is also made.

Yield grade Canada 1, Canada 2 or Canada 3 is an estimation of the percentage of the carcass that is red meat.

Talk About It!

Invite a trained beef grader to your meeting to discuss the training required for the position and what they look for in a beef carcass. Or, invite a professional cattle buyer that buys for a packing plant/butcher shop to discuss what they look for when buying live cattle for processing.

Experience It!

Visit an agricultural fair that has a beef carcass competition. View the carcasses and the grades assigned to each carcass. If possible, be present when the judge announces the winners of the competition and gives reasons for the placings.

Yield Grades

Yield Grade	Estimated Yield (%)
Canada 1(Y1)	59 or more
Canada 2(Y2)	54 to 58
Canada 3(Y3)	53 or less

Credit: Beef Cattle Research Council www.beefresearch.ca

A ruler, developed by the Agriculture and Agri-Food Canada Lacombe Research Station, is used to measure the fat depth and ribeye length and width. These measures of fat and lean are then used to predict an overall carcass lean yield.



Photo credit: Beef Cattle Research Council www.beefresearch.ca

U.S. GRADE EQUIVALENCY

The U.S. equivalent grade for Canada Prime is USDA Prime. Canada AAA, AA and A are equivalent to USDA Choice, Select and Standard respectively.

U.S. Yield grade 1 to 5 is also largely based on fat and REA (Hot Carcass Weight + Kidney Pelvic Heart fat). It does not reflect total lean percent, but a prediction of cutability for closely trimmed, boneless retail cuts from the round, loin, rib and chuck.

ONTARIO CORN FED BEEF PROGRAM



The Ontario Corn Fed Beef program provides consumers with an identifiable Ontario brand of beef – known to be consistent, premium and locally-raised. This program is in addition to the Canadian Beef Grading System. This quality assurance program ensures that only Canada AA and AAA beef is used.

The feed of cattle plays a big role in the flavour of the beef. In the Ontario Corn Fed Beef Program, cattle consume a high percentage of corn in their diets. This diet gives beef superior marbling which makes it tender and tasty.

Judge It!

Either at an agricultural fair that has a beef carcass competition or at a grocery store or butcher shop that have cuts of meat for sale, look at the carcasses/cuts of meat and decide what criteria you look for in a desirable carcass/cut of meat. After the criteria has been established, place the carcasses/cuts of meat and be prepared to give reasons.

The Ontario Corn Fed Beef (OCFB) Quality Assurance program is designed to produce a consistent quality beef animal that has been raised by a specific set of guidelines in order to provide a premium product to the marketplace. To be eligible to participate in the program, beef farmers must follow stringent quality assurance protocols.

A producer becomes certified by adhering to the following procedures:

The OCFB Program Producer has complied with the following:

- Completed Ontario Corn Fed Beef Quality Assurance Training
- Animals sold live through a sales ring are properly identified with OCFB tag
- Adhered to feed regimen as per program guidelines
- Submitted feed samples for testing
- Feed tags/labels for each ration ingredient
- All animal health products have Drug Identification Number (DIN)
- Prescriptions on-file for off-label use, feed and water medications

OCFB Producer has completed the following records and reviewed corresponding Standard Operating Procedures (SOP's):

- Cattle Receiving Record
- Ration Composition Record
- Suspect Feed Investigation Record
- Animal Treatment Record
- Group Treatment Record
- Animal Health Product Inventory Record

Review of additional Standard Operating Procedures (SOP's):

- Animal Health Management Procedure
- Feed Receiving Procedure

Review of on-farm management Good Production Practices (GPP):

- Bio Security
- Sanitation
- Pest Control
- Feed Storage
- Medicine Storage
- Water Quality

OCFB Producer must:

- Allow a third party Auditor to visit the farm for initial certification and approval – Pre-AUDIT Review
- Complete a Producer Audit Self-Assessment Tool
- Allow a third party Auditor to visit the farm for subsequent on-farm audits – Final AUDIT

BEEF GRADING ADVANCEMENTS

Evaluating and developing grading tools and sharing information are necessary in order to improve the grading process for the delivery of a consistent beef product and sending signals back to producers for livestock production.

e+v Technology

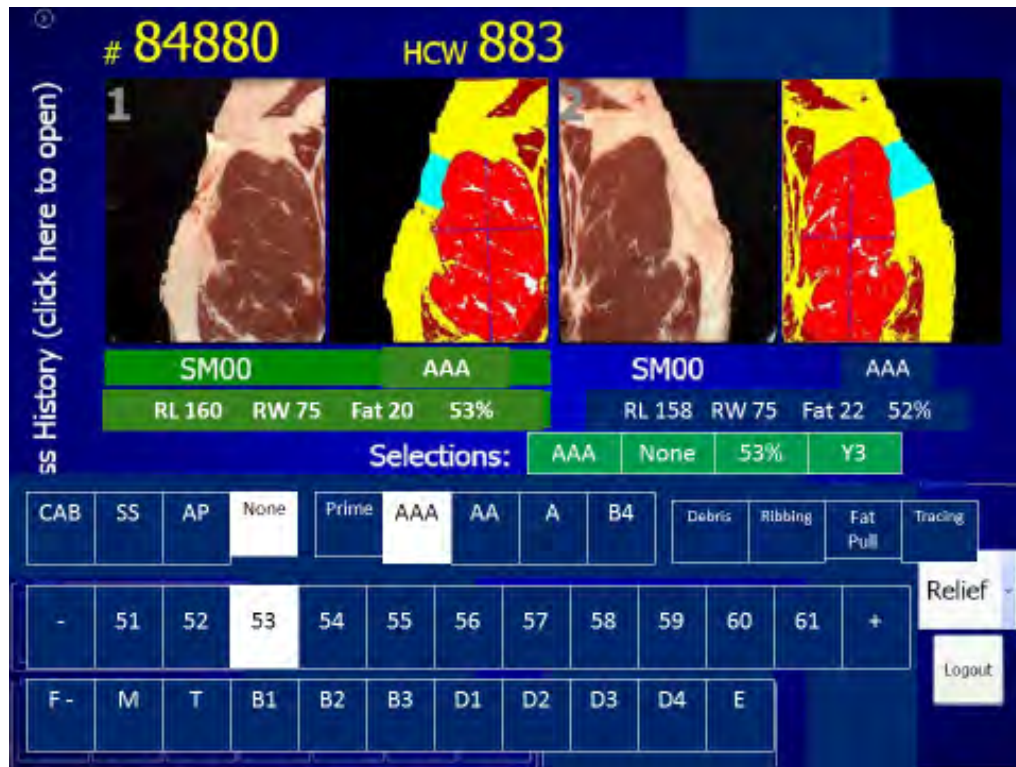


Photo credit: Canadian Beef Grading Agency

One of the most recent developments is the computer vision grading system e+v Technology GmbH Beef Instrument Technology. It marks the first major advancement in the Canadian system since the Computer Vision System (CVS) camera was introduced in 1999. The e+v technology is approved for use as a grading aid by the Canadian Food Inspection Agency and enables improved grading accuracy under current grading regulations.

The e+v grading instrument is a stationary machine that photographs and analyses the rib eye area between the 12th and 13th ribs of both sides of each carcass as it passes by on a moving rail. At present, the computer grading camera measures grade, fat, rib eye width, rib eye length,

and calculates a lean yield percentage, providing a lean yield grade and a marbling score. In some situations, such as where it is difficult for the camera to get an accurate reading, a grader can provide an overall assessment or override the camera's grading.

This technology is objective and assesses marbling under the same light and at the same distance from the rib eye based on minute calculations of red and white pixels within the traced muscle. This reduces the variability inherent with human assessment. The information captured can be stored, shared and further analyzed.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

AT HOME ACTIVITY

Find out what the main feeds are for finishing beef cattle in your area. Ask a local farmer or feed nutritionist how this feed affects the quality of meat, if the feed helps to finish the beef animals quicker and if the feed helps with marbling in the meat.

DIGGING DEEPER FOR SENIOR MEMBERS

Technology for grading beef keeps advancing rapidly. As shown in this meeting, computer visioning for grading beef is in its early stages but shows great promise. Research where the technology development process is at and whether this technology is being embraced by the beef industry.

SECTION 6E: BEEF VALUE CHAIN

SETTING OBJECTIVES:

Having a value chain for any food product is important. Each link in the value chain must work together to ensure an efficient and effective food production system. The value chain for the beef industry helps the industry to have a competitive advantage in local and international markets.

Suggested Lesson Outcomes

- To understand what the beef value chain is and what components make up the chain.
- To realize why it's important to have a value chain.

ROLL CALLS

- Name one part of the beef value chain.
- Name a grocery store where you can purchase beef.
- Why is it important to understand value chains?

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information The Canadian Beef Value Chain Activity #1 Beef Value Chain	30 min + Activities
At Home Activity	Purchasing Local Beef	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

THE CANADIAN BEEF VALUE CHAIN

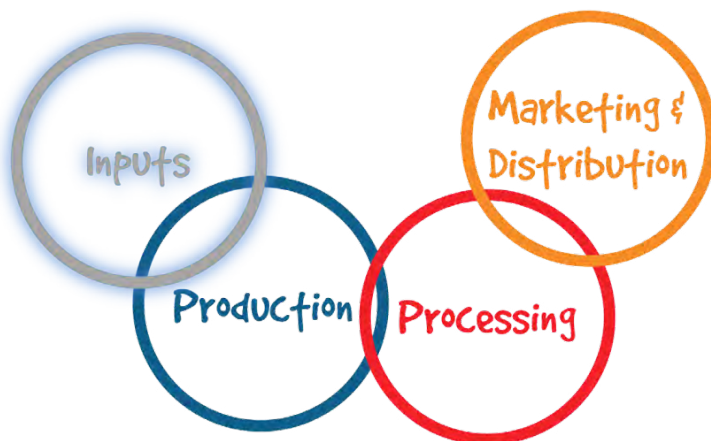
A value chain provides a structure and a process for cooperation between each “link” in a chain of enterprises that adds value to an end product that a customer purchases –in this case the product is beef.

The links in the beef value chain include input suppliers (such as feed suppliers), producers, processors, food services, retailers, traders and associations as well as federal and provincial government policy makers. As part of the Canadian beef value chain, it’s important that producers are engaged and look beyond their farm gate to see the big picture.

Each link in the value chain must work together to give the Canadian Beef Industry a long-term competitive advantage in both domestic and international markets, and to effectively and efficiently respond to customer preferences. To achieve these goals, the Canadian beef value chain engages in the:

- Creation of a shared vision, trust and long-term, cooperative strategies
- Identification of research, policy, regulatory and technical requirements
- Sharing of information and data
- Evaluation of performance
- Coordinated response to crises

The value chain is key to the success of the Canadian beef industry, ensuring that each aspect of the industry is responding effectively to changing markets and customer preferences in order to keep that competitive edge.



Credit: 4-H Alberta

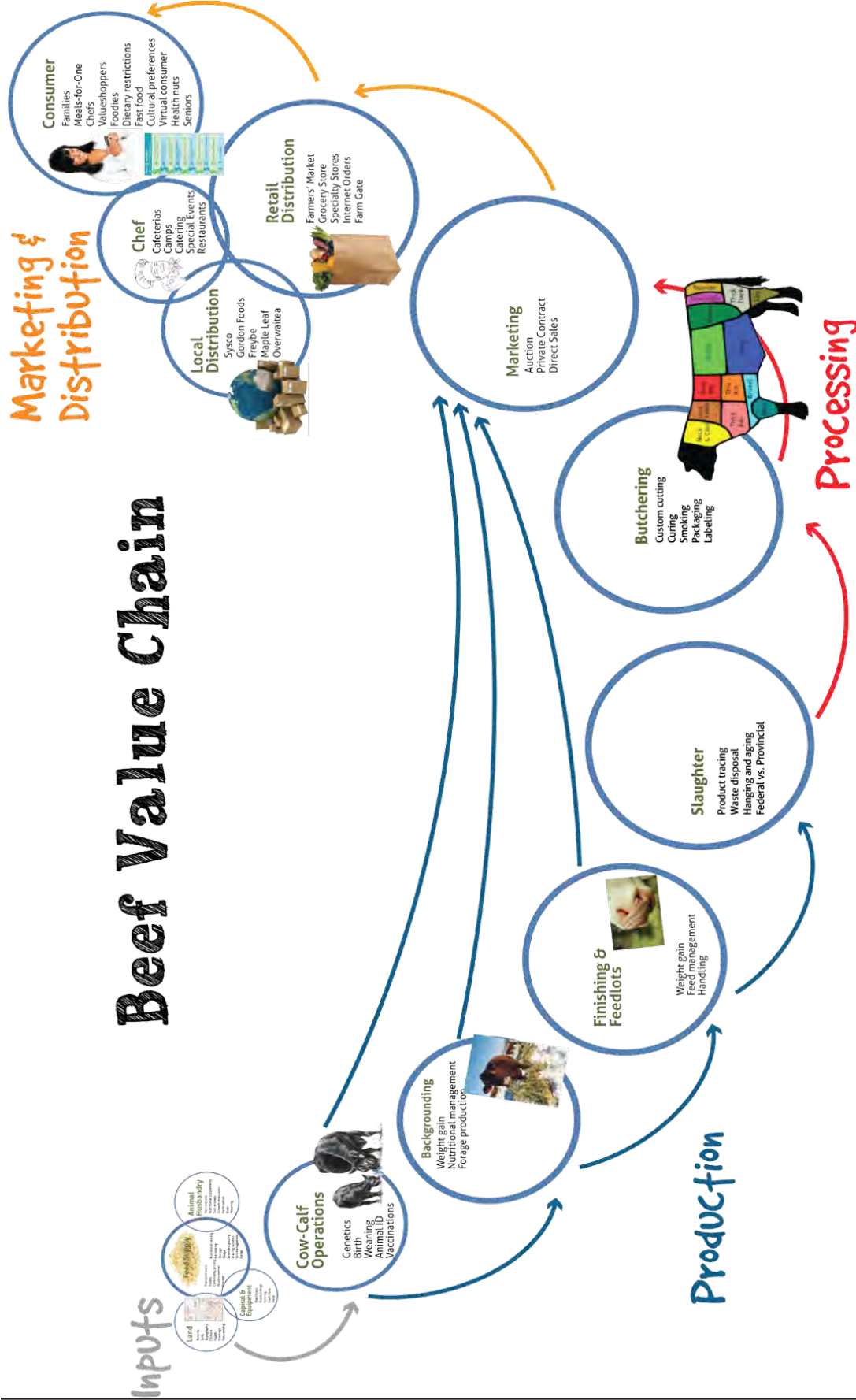
Experience It!

Look at any link in the value chain to see how it fits with the rest of the value chain.

Judge It!

Make a list of criteria of what you think makes a good advertisement. Find four different advertisements for Canadian beef. It can be from a grocery store, restaurant or any other type of ad you can find. Judge the ads and be prepared to give reasons as to why you placed the advertisements in the order you chose.

Beef Value Chain



Credit: 4-H Alberta

Talk About It!

How has Canada responded to crises in the beef industry in the past? What happened to the beef industry in 2003 when BSE was discovered in a beef animal in Canada? This activity may involve doing some research to see how this crisis was handled.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about the beef industry through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

**ACTIVITY #1
BEEF VALUE CHAIN**

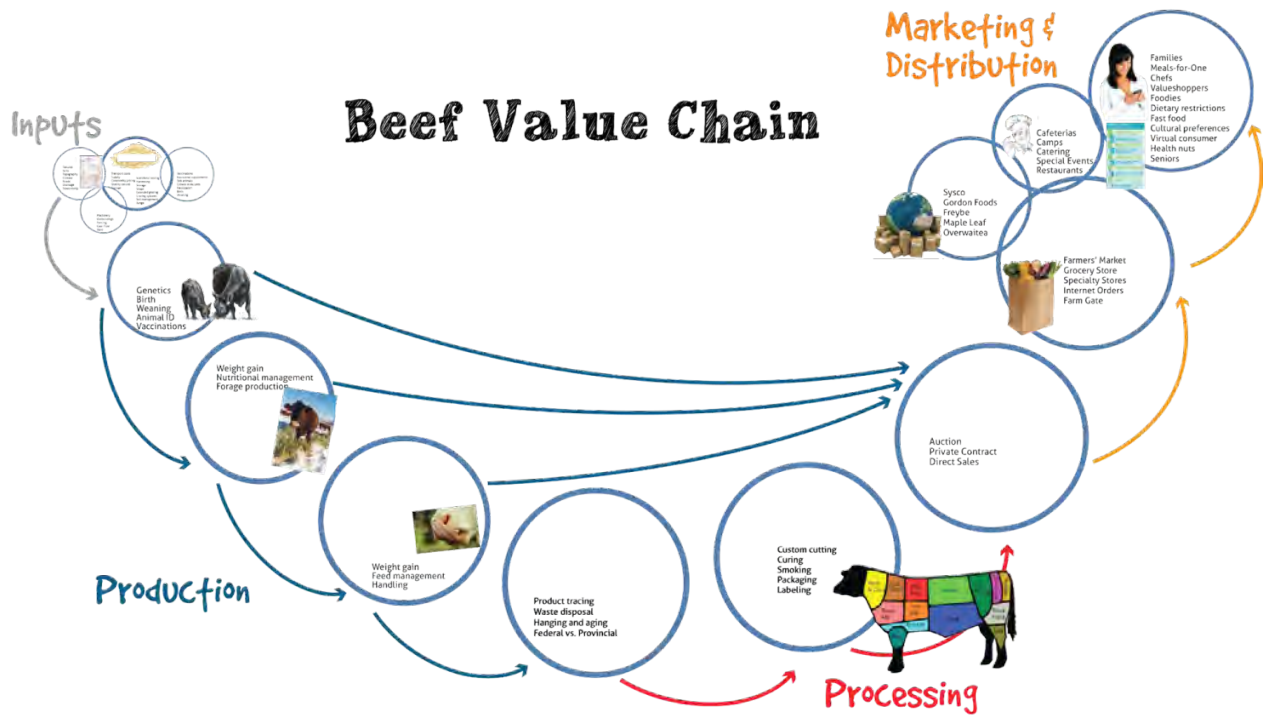
DO	<p>Time: 20 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> – Beef Value Chain worksheet – Writing utensil <p>Instructions:</p> <ul style="list-style-type: none"> – Give each member a Beef Value Chain worksheet – Explain the worksheet and have members label the parts of the value chain. – Review the worksheet and discuss what each part of the value chain does and how it contributes to the overall health of the beef industry. – Have members add in timelines in the production section of the Beef Value Chain to figure out how long it takes from the time a calf is born until it goes to slaughter (processing plant).
REFLECT	<p>Learning Outcomes:</p> <p>To allow members to identify and understand the various links within the Beef Value Chain. It is important to realize how each link affects the others and how the system can fail if the links do not all fall into place.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none"> – Why is it important to know and understand the links within the Beef Value Chain? – Was it easy or hard to fill out the worksheet? – Are there any additional links you think should be added to the value chain? – Are there any links that could be deleted from the value chain? – How does the length of time from the time a calf is born until it reaches the packing plant affect the adaptability of the beef industry?

ACTIVITY #1 WORKSHEET

BEEF VALUE CHAIN

Instructions:

1. Label each of the following links on the Beef Value Chain.
2. In the production section of the Beef Value Chain, add in timelines to figure out how long it takes from the time a calf is born until it goes to slaughter (processing plant).



Finishing & Feedlots

Capital & Equipment

Marketing

Consumer

Retail Distribution

Feed Supply

Local Distribution

Backgrounding

Land

Butchering

Cow/Calf Operations

Animal Husbandry

Chef

Slaughter

Credit: 4-H Alberta

AT HOME ACTIVITY

For many consumers, buying local is very important to them. Look in your area to see where beef can be purchased locally. Find out where these local stores source their beef, where it is processed and how they market their beef.

DIGGING DEEPER FOR SENIOR MEMBERS

There are two types of packing plants in Canada – provincial and federal. Find out what the difference is between the two and why there are two levels.

UNIT 6F: MARKET ANALYSIS – CATTLE CYCLE

SETTING OBJECTIVES:

To have a chance at being successful in the beef industry, it is important for producers to understand the cattle cycle in order to better understand market conditions and what affects the beef cattle market.

Suggested Lesson Outcomes

- To realize the importance of knowing beef market conditions
- To understand what the cattle cycle is.
- To be able to identify factors that influence the cattle cycle

ROLL CALLS

- Name one thing that would affect the cattle cycle.
- Name one way the weather can affect the cattle cycle.
- Why is it important to understand beef cattle market conditions?

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Cattle Cycle	30 min + Activities
At Home Activity	BSE and the Cattle Cycle in Canada	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

CATTLE CYCLE

The more knowledgeable of market conditions a producer is, the better they can position themselves for success and the more profit they could potentially realize when the time comes to market their product. It is important that producers stay up to date as markets for Canadian beef are constantly changing, along with factors that affect the domestic and international markets, such as supply and consumer demand.

Cow-calf producers tend to expand inventory numbers in response to profits and reduce herd size in response to losses. Generally, as cattle numbers go down, prices go up and as cattle numbers go up, prices go down. Ultimately, this process has resulted in long-term patterns in the cattle inventory, what is commonly called the cattle cycle.

The lag time between when producers get the price signal to expand production, and when they can actually expand due to beef cattle biology, is what makes the average length of a typical cycle about 10 years.

Typical Cattle Cycle

Beginning of the Cycle

- There are low cattle numbers and prices begin to increase because of this
- The increasing prices encourage existing producers to expand and new producers to enter the market, causing cattle numbers to increase.

Mid-Cycle

- Cattle numbers begin to peak and these high inventory numbers begin to push prices downwards
- This is followed by a turn-around phase where cattle numbers begin to decrease as price margins become less attractive.

End of the Cycle

- Cattle numbers are at their lowest since the beginning of the cycle;
- Prices begin to increase and the cycle begins again.

Keep in mind that this is a typical cattle cycle, and that changing consumer demand, mixed market signals, internal production factors as well as external factors such as weather or trade

Research It!

Find out what the beef cattle numbers in Canada and in Ontario have been over the past 10 years. If possible, expand your research to the past 20 years.

The find out what the price of beef cattle has been over the same time period. Is there a pattern? Create a graph showing the relationship between cattle numbers and cattle prices.

Reach Out!

Invite a cattle buyer that has been in the beef business for a number of years to your meeting to speak about cattle cycles and what they have seen over the years.

barriers for example, can have a greater influence on producer decisions than price, and can therefore disrupt the cycle. Therefore, no two cycles are exactly the same.

4-H beef project members should keep in mind that some 4-H market beef animals are bought at a premium price that exceeds actual market price.

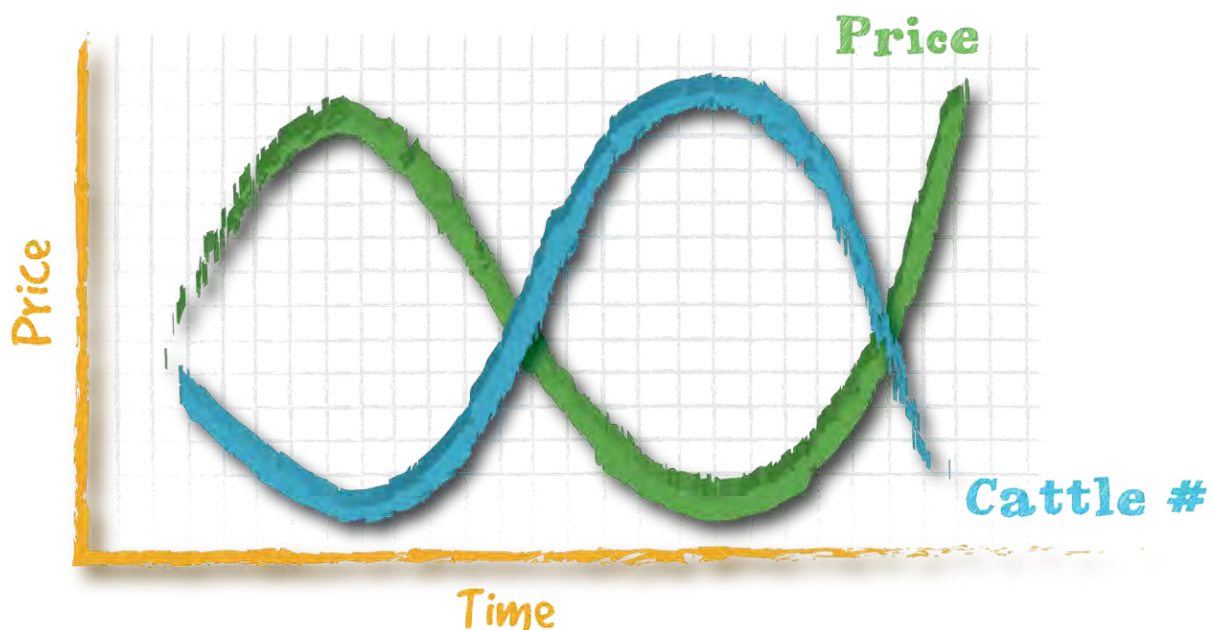
Judge It!

Take a poll within your group as to what their favourite kind of steak is. The one that is the most popular was chosen by 'consumer demand' as each member of the club is also a consumer.

From those that chose the most popular steak in the group, find out why that type of steak is their top choice. This is their criteria for choosing a steak.

Find four pictures of this type of steak and, based on the criteria listed, place the pictures of steak first through fourth. Be prepared to give reasons.

Cattle Cycle



Beginning of the Cycle:

As Cattle numbers decrease, price begins to increase.
Increasing prices encourage expansion
and new producers to enter the market

Mid-Cycle

Cattle numbers begin to peak; high inventory pushes
prices downwards.
Cattle numbers then begin to decrease as price margins
become less attractive.

End of Cycle

Cattle numbers are at their lowest since the beginning
of the cycle.
Prices begin to increase, cycle begins again.

Check It Out!

Watch Beef TV courtesy of
4-H Alberta. Learn about
the beef industry through
their eLearning tools
found at: <http://www.4h.ab.ca/Beef/>

Credit: 4-H Alberta

AT HOME ACTIVITY

BSE, which was found in Canada in 2003, caused a disruption to the cattle cycle. Doing an online search or by going to the library, find out how it affected the Canadian beef industry both financially and what it did to the cattle numbers in Canada.

DIGGING DEEPER FOR SENIOR MEMBERS

International Trade Agreements and Trade Barriers can play a large role in the cattle cycle. Look at a trade agreement that Canada has with another country (or countries) and find out how beef is exported to other countries and/or imported into Canada within the agreement. Find out how/if the trade agreement benefits the Canadian beef industry.

SECTION 6G: TOOLS FOR THE INDUSTRY – BEEF MARKETING

SETTING OBJECTIVES:

Developing a good marketing plan is crucial when producing a product. There are many factors that go into creating a marketing plan and producing beef is no different. Focusing on the 4P's, members will learn how to create a proper marketing plan, whether it is an animal or a beef product.

Suggested Lesson Outcomes

- To understand that marketing is a process
- To be able to identify the 4P's of marketing
- To understand labelling on beef products and to identify which beef products are Canadian beef

ROLL CALLS

- Why is it important to understand proper marketing of a product?
- Have you ever sold a product before? Where did you sell it and how successful were you?
- Name one place you could sell a beef product.

SAMPLE MEETING AGENDA Time: 1 hour 10 minutes plus activities

Welcome, Call to Order & Pledge		10 min
Roll Call		5 min
Parliamentary Procedure	Minutes & Business	10 min
Topic Information, Discussion & Activities	Topic Information Marketing & the 4P's Canadian Branding of Beef Activity #1 The 4P's of Your Beef Project	30 min + Activities
At Home Activity	Canadian Beef in Restaurants	5 min
Wrap up, Adjournment & Social Time		10 min

TOPIC INFORMATION

MARKETING & THE 4P'S

Marketing is a process that involves identifying and understanding customer's needs and wants, and profitably producing a product or service that satisfies those needs and wants. When developing a marketing plan for a product or service, one that will positively impact production and your bottom line, think about the 4Ps:

Product

Price

Place

Promotion

Product: What are you going to sell?

- Is your product replacement heifers, live steers, bulls, semen or embryos, carcasses, boxed beef, valued added products or individual meat cuts for example?
- Is your beef grass finished or is it produced organically or locally? Is your product part of a current consumer trend?

Price: How much can you charge for your product?

- What are your estimated costs of producing your product?
- What are the market conditions and price forecasts for your product?
- Based on estimated production costs and breakeven calculations, what is your target price?
- Is there currently a premium offered for your product?
- How will the product be delivered to the buyer? How does that affect the price?

Place: Where will you sell your product?

- Through live, video or electronic auction, private contract, producer or breed association sales, direct sales to packers, wholesale distribution or retail distribution including farm-gate, farmer's markets or speciality stores for example?
- What is the associated pricing method for each market delivery option?

Communicate it!

List examples of value added beef products. Try to create as large a list as possible.

Research It!

Some cattle receive a premium because of their breed or age. Find out which breeds are eligible to receive this premium and at what age an animal has to be under to receive a premium.

Check It Out!

What are direct sales to packers? Ask a beef producer to explain this to your club. Find out why they chose this option for selling their product.

Promotion: How will people find out about your product?

- Will your product be branded?
- Does what you're saying about your product align with what you're delivering?
- Is your product meeting the customer's wants or needs?

With so much to think about when it comes to marketing, having a plan to refer back to is crucial. And like any plan, it's important that you refer back to it and evaluate how well it worked in order to make timely adjustments and improvements.

CANADIAN BRANDING OF BEEF

Product of Canada

The words "Product of Canada" stamped on the box does not mean the product in the box is from Canada – it simply means that the beef has undergone some form of processing in Canada. The product in the box may be Canadian but it could also be imported beef that has been "reworked" (i.e. undergone trimming or portioning) in Canada.

Canadian Federal or Provincial Inspection Stamp

The Canadian Federal or Provincial Inspection stamp on the label or box doesn't mean the beef inside is Canadian – it just means that the product has been inspected and approved at a Canadian plant as meeting a standard set of health and safety guidelines under the supervision of the Canadian Food Inspection Agency (CFIA). The stamp will also have a number listed on the bottom that refers to the plant at which the product was processed. For a list of establishments and their associated numbers, go to the CFIA website at: www.inspection.gc.ca.

If you want to be sure the beef you buy is Canadian, what do you look for?

Look for the Canadian Grade.

The Canadian Grading System

The Canadian Beef Grading Agency (CBGA) is a private, non-profit corporation. They have been accredited by the Canadian Food Inspection Agency (CFIA) to deliver grading services for beef in Canada. The Federal Government, based on recommendations from industry, sets the grade standards. Only Canadian beef that has been

Experience It!

Visit a Farmer's Market, a specialty store that sells beef products or a farm that does farm-gate sales or have someone who sells their products this way be a guest speaker. Have his or her explain why they market their product this way and what their challenges and successes have been.

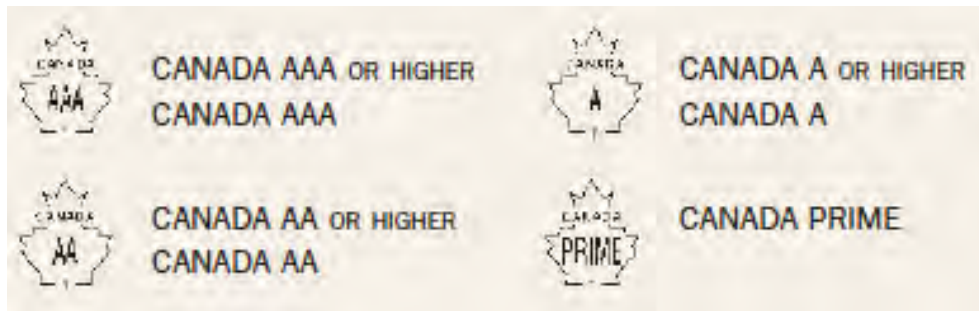
Judge It!

Look at the branding on four different packages of beef products. As a group determine what will catch the consumer's eye and what information the consumer will be looking for (criteria).

Once a list of criteria has been created, judge the four different packages and be prepared to give reasons as to why you place the packages in the order you chose.

processed in a federally or provincially inspected facility can be assigned a Canadian grade name by the CGBA. Grading is not mandatory.

One sure way to know that your beef is Canadian is to ensure the official Canada Grade Name is clearly printed on the label. To be “official” the Canada Grade name must be noted as follows; it must be shown in these words with or without the maple leaf:



These grade labels refer to Canada’s top grades, which have minimum marbling requirements, and set characteristics for maturity, muscling, meat and fat colour and texture.

Any variation on these names as listed above is not allowed. For example “Angus AA,” “Canadian A,” “AAA,” “Certified A or higher,” “Premium AAA,” “Mucky Lake Top Quality AAA Beef” are not allowable grade designations. Remember that the colour of an animal’s hide, or designation of a special name or program, is not a grade. If you find mislabelled product, question the supplier and report the suspected misrepresentation to the CBGA.

When branding Canadian beef products, the logo above, the Canadian Beef Brand Mark, is often found on packaging and in advertising and signifies an unparalleled dedication to sustainability, nutrition, quality and food safety by the Canadian beef industry. The logo belongs to Canada Beef, the organization that promotes beef products and the beef industry in Canada, and must be used in accordance with their standards.



Do It!

Look at various beef products and determine if it is Canadian beef or if it has just been processed, inspected and approved in Canada.

Check It Out!

Watch Beef TV courtesy of 4-H Alberta. Learn about marketing beef through their eLearning tools found at: <http://www.4h.ab.ca/Beef/>

**ACTIVITY #1
THE 4P’S OF YOUR 4-H BEEF PROJECT**

NOTE: If a 4-H member does not have a 4-H Beef Project animal, this activity could be completed using any beef related product.

DO	<p>Time: 30 minutes</p> <p>Materials Needed:</p> <ul style="list-style-type: none"> – The 4P’s of Your 4-H Beef Project worksheet – Writing utensil <p>Instructions:</p> <ul style="list-style-type: none"> – Give each member a 4P’s of Your 4-H Beef Project worksheet – Explain the worksheet and have members answer the questions. – Review the worksheet and discuss the various answers that each member gave for each of the questions.
REFLECT	<p>Learning Outcomes:</p> <p>To allow members to identify and understand the 4P’s of marketing and how the 4P’s affect them personally in relation to their project animal or a potential beef product that they might be selling.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none"> – Why is it important to know and understand the 4P’s of marketing? – Was it easy or hard to fill out the worksheet? – Would it be easier to complete this worksheet using a product that isn’t a live animal? – Would it be easier to complete this worksheet using a product that isn’t a beef product? – Were you surprised by some of the answers that other members had? – Did you learn any new ideas from other members in your club?

WORKSHEET
THE 4P'S OF YOUR 4-H BEEF PROJECT

For your 4-H Beef Project, work through the 4P's of Product, Price, Place and Promotion.

Product: What are you going to sell?

Price: How much can you charge for your product?

Place: Where will you sell your product?

Promotion: How will people find out about your product?

Credit: 4-H Alberta

AT HOME ACTIVITY

Take a look at how various restaurants market the beef they are serving. Do they market it as Canadian beef? If so, what do they have in their advertising so consumers know they are purchasing Canadian beef?

DIGGING DEEPER FOR SENIOR MEMBERS

Look at your beef farm (or interview a beef farmer and find out about what they produce on their farm) and create a marketing plan for the product being produced on the farm using the 4P's. Be prepared to share your marketing plan at a 4-H meeting as well as the farmer you interviewed, if not using your own farm.

INTO THE SHOWRING



SECTION 7A: SELECTING A PROJECT

SETTING OBJECTIVES

When selecting a project and possibly a project animal, there are a lot of options to consider. This meeting will introduce members to the project and animal selection process and help them to make smart project selection choices, in order to ensure that they have successful and rewarding experiences while participating in a 4-H Beef Project.

Suggested Lesson Outcomes

- To have members select a project that is well-suited to their interests.
- To select a project that will contribute to extended learning about the beef industry.
- To offer projects whereby members select a project animal to work with, or where members can learn about the beef industry without participating in showing animals.
- Help members feel confident selecting a project for the beef club.
- Determine the factors that go into selecting a project animal.
- Learn about beef breeds and their history, physical characteristics and dominant traits.

REFERENCE MATERIALS IN THIS SECTION

- Selecting a Project - What should I consider?
- The Types of Project Animals
- Breeds of Beef Cattle
- Factors for Consideration When Picking a Project Animal

ACTIVITIES

- Activity #1 Goal Setting
- Activity #2 Breaking Records
- Activity #3 Match My Origin
- Activity #4 Who Am I Breed Activity
- Activity #5 The Selection Checklist
- Activity #6 Rank the Selection Factors
- Activity #7 Beef Selection Crossword

SAMPLE MEETING AGENDA – 2hours, 30mins

Welcome, Call to Order & Pledge		10 min
Topic Information, Discussion	Selecting a Project - What should I consider?	5 min
Activities Related to Topic	Activity #1 Goal Setting	15min
Topic Information, Discussion	The Types of Project Animals	5 min
Activities Related to Topic	Activity #2 Breaking Records	10 min
Topic Information, Discussion	Breeds of Beef Cattle	15 min
Activities Related to Topic	Activity #3 Match My Origin Activity #4 Who Am I Breed Activity	20 min
Topic Information, Discussion	Factors for Consideration When Picking a Project Animal	15 min
Activities Related to Topic	Activity #5 The Selection Checklist Activity #6 Rank the Selection Factors Activity #7 Beef Selection Crossword	40 min
Wrap up, Adjournment & Social Time!		10 min
At Home Activity	Interview with a producer	5 min

TOPIC INFORMATION

SELECTING A PROJECT– WHAT SHOULD I CONSIDER?

There are a lot of beef project options for members, leaders and clubs to consider. Members should choose the project or projects they are most interested in, and that also are a good fit for their knowledge/skill level, as well as the type of support available. Leaders and clubs should keep an open mind to new project ideas and help each member and their family make a plan for successfully managing their beef project or projects.

Potential projects could include:

- Market Heifer/Steer
- Breeding Heifer
- Cow/Calf Project
- Carcass Market Beef Project
- General Research About the Beef Industry

In this section, we will focus on the concept of using an animal for your project.

If you are considering using an animal for your project, there are several questions to ask yourself:

- What is my goal for this animal’s future (breeding stock, show stock, meat production, etc.)?
- What classification of animal do I want (purebred, crossbred, market)?
- How will I access my animal (through my own herd, from a herd nearby, through purchase)?
- Which animal will best fulfill my goal (how old should my animal be, which breed, which specific animal)?

Answering these questions will help you to choose a suitable project animal. Being successful in fulfilling your goal for your project animal will require planning and dedication at every step. The planning begins through selection. Selecting your project animal is a fun but challenging process. Be sure to ask for advice from those around you and pick a project that you are confident will be your best partner.

THE TYPES OF PROJECT ANIMALS

4-H members have the opportunity to show just about any type of beef animal for their project, depending on the specialization of their club. Some clubs welcome both market animals and breeding animals into their clubs, some focus on heifer calves and yearlings, others allow mature animals, and some will allow any combination of the lot. Be sure to check in with your club leaders about their program to ensure that your goals align.

Market Animal – Market animals are animals that are raised and exhibited at shows with the ultimate goal of being purchased through a sale and harvested for meat. Members can choose a market heifer or a market steer project of any breed/crossbreed. Animals are typically spring yearlings, born somewhere between March and May of the previous year. Members will select, manage, care for, and market their steer or heifer, all while learning about many different aspects of the beef industry. They can then participate in spring shows with their calves as prospect market animals and then take them forward to fall shows with the goal of participating in a market show and sale. Projects are divided into classes at shows based on breed and/or weight.

Breeding Heifer Project – Breeding heifer projects can include calendar-year heifer calves or yearling heifers. Heifers are typically born anywhere between January 1st of the previous year and May 1st of the current calendar year. In this project, members will breed, manage, care for, and potentially market their heifer. Project heifers can be shown at shows throughout the year, with the ultimate goal of incorporating the animal into an existing herd as a producing animal or marketing it to another breeder. Projects are divided at shows based on age and/or breed.

Cow/Calf Project – These projects are often a continuation of the Heifer Project. Members will manage, care for, and potentially market a beef cow and/or calf. Pairs generally include a mature female who is at least 2 years of age. Her calendar-year calf shows with her as a unit. Project pairs can be shown throughout the year, with the ultimate goal of incorporating the animals into an existing herd for continuing production or marketing it to another breeder. Projects are divided at shows based on age and/or breed.

Carcass Market Beef Project - The Carcass Market Beef Project involves raising a steer or heifer for slaughter and carcass evaluation. Members will select, manage and care for the carcass project steer or heifer until it goes to slaughter. Additionally, they will market the carcass. For this project, it is recommended that a display of the Carcass Market Beef Project is featured at the club's Achievement Day. It is up to the club's discretion as to how the project animal is marketed.

BREEDS OF BEEF CATTLE

There are many different breeds of beef cattle throughout the province, all of which have strengths in different areas of the beef industry (i.e. some are known for their docility, some for high carcass yields, etc.). Decisions regarding which breed to invest in for a given producer can be based on tradition and emotion, where a family has been involved in one breed for several generations, or they can be made based on current market trends and the breed's ability to best aid in the herd's production. For instance, factors such as breeding goals, the environment in which the herd is stationed, the quality of feed and seedstock available locally, etc. should be taken into account when selecting breeds.

Breeds of beef cattle are generally classified into two groups; British Breeds and Exotic Breeds. British Breeds are those that originated in England, Scotland, Ireland, and Wales and include

Talk about it!

Cattle gain an average of 2-3 pounds per day when fed and cared for properly. Ensure that your animal is housed in stress-free conditions and fed well so that it will be at the ideal weight for your final show. For your specific type of project, what do you think the ideal weight for your animal is for your final show?

Angus, Hereford, Shorthorn, Galloway, Highland, Murray Grey, and several others. Exotic Breeds include Belgian Blue, Blonde d' Aquitaine, Charolais, Chianina, Gelbvieh, Limousin, Maine-Anjou, Piedmontese, Pinzgauer, Salers, Simmental and several others. These breeds originate from Europe and other countries outside of Great Britain and were introduced more recently to Canada than the British breeds.

Share It!

There are an estimated 800+ breeds of cattle in the world.

Share with the group what your favourite breed of beef cattle is and why it is your favourite.

Breed Comparisons

The environments and resources available to raise beef cattle are as varied as the breeds themselves. [Table 1](#) groups breeds into biological types for four criteria. The table is based on extensive research performed over the past 25 years at the Meat Animal Research Centre in Clay Centre, Nebraska.

The table compares breeds and ranks them according to criteria important to the producer and their herd or market, whether it is reproduction, growth, carcass traits or a combination of them all. More information is available on a breed-average basis for individual traits than is presented here, but a large degree of variability can exist within a breed. Breeding decisions involve individual animals, not breed averages, so selection of the right individuals within a breed is critical. This information can be used to familiarize yourself with available breeds and narrow down your choices. Selection of individual animals for a breeding program or project will require analysis of the individual's genetic merit for the traits of interest. Breed differences can be blamed for product inconsistency, but they can also be exploited to produce adapted animals and a consistent product.

Table 1. Breeds Grouped into Biological Types for Four Criteria***

Breed	Growth Rate and Mature Size	Lean to Fat Ratio	Age at Puberty	Milk Production
Longhorn	X	X X X	X X X	X X
Herf-Angus	X X X	X X	X X X	X X
Shorthorn	X X X	X X	X X X	X X X
Galloway	X X	X X X	X X X	X X
Pinzgauer	X X X	X X X	X X	X X X
Brahman	X X X X	X X X	X X X X X	X X X
Gelbvieh	X X X X	X X X X	X X	X X X X
Simmental	X X X X X	X X X X	X X X	X X X X
Maine Anjou	X X X X X	X X X X	X X X	X X X
Salers	X X X X X	X X X X	X X X	X X X
Piedmontese	X X X	X X X X X X	X X	X X
Limousin	X X X	X X X X X	X X X X	X
Charolais	X X X X	X X X X X	X X X X	X
Chianina	X X X X	X X X X X	X X X X	X

Credit: Cundiff et al., 1993 BIF Proceeding, <http://www.omafra.gov.on.ca/english/livestock/beef/facts/01-051.htm>

***Increasing number of X's indicate relatively higher values.

Common Breeds of Beef Cattle In Ontario

A brief overview of the history, physical characteristics and dominant traits of the beef cattle breeds common to Ontario follows. The breeds in this section have substantial numbers in both purebred and commercial operations and have undergone substantial selection programs over the years. The breeds listed offer the genetics and selection required to develop a breeding program suitable for the available market.

Angus

The Aberdeen Angus breed existed in Scotland 400 years ago and evolved during the 19th century in northeast Scotland in the counties of Angus and Aberdeen. The first Aberdeen Angus was imported into Canada in 1860.



Angus cattle are solid black or red and are polled. Both colours are registered in the Canadian Angus Association herd book. Angus are noted for good maternal qualities and a high carcass quality. Angus cattle are also recognized for their ability to forage under rugged conditions.



Photo credit: Canadian Beef Breeds Council www.canadianbeefbreeds.com

Judge it!

Create a set of criteria that you think is most important in a beef animal.

Randomly choose four breeds of beef cattle from the list and rank them based on the set of criteria you have created.

Do it!

One easy way to check for soundness in feet and legs is to examine the stride of the animal. A sound-moving animal should have their rear foot step into the footprint of the front foot on each side. Either at your club meeting or at home, walk a trained beef animal and examine its stride. Is it a sound animal?

Blonde d'Aquitaine

Blonde d'Aquitaine originated in the southwest of France, where they developed as a dual-purpose breed. Animals are cream to fawn coloured. The breed is horned and recognized primarily for its beef characteristics and high yielding carcasses. The first Blondes were introduced into Canada in 1971.



Photo credit: Canadian Beef Breeds Council www.canadianbeefbreeds.com

Charolais

Charolais, one of the oldest French breeds and the earliest European import into Canada, arrived from the U.S. in 1955 and from France in 1967. Originally, Charolais were used for meat, draft and milk, but have since become specialized as a beef breed. Cattle of the Charolais breed are large and heavy, white to cream-coloured and either horned or polled. Through sire evaluation and breed improvement, they offer the beef industry hardy cattle with rapid growth and good muscling.



Photo credit: Canadian Beef Breeds Council www.canadianbeefbreeds.com

Gelbvieh

Gelbvieh or German Yellow Cattle evolved in the early 19th century through the crossing of various breeds in northern Bavaria. This produced a growthy dual-purpose animal that also served as a draft animal. Gelbvieh have been in Canada since 1972. Emphasis in North America in recent years has been on meat production.

The Gelbvieh is solid-coloured, reddish gold to russet or black, with fine dense hair. They have good size, heavy muscling and are known for their desirable carcass and strong maternal characteristics.



Photo credit: Canadian Beef Breeds Council www.canadianbeefbreeds.com

Hereford

The Hereford, one of the oldest cattle breeds, was developed in Herefordshire, England. First importations into Canada were in 1860.

The Hereford is a reddish-brown colour with white on the head, brisket, chest, underpart of the body, lower legs and tassel. The white face is a dominant characteristic. Herefords can be either horned or polled.

Hereford cattle are extremely hardy and show excellent foraging ability. Among beef breeds, they are not high milk producers but have good growth potential and calve relatively easily. Their popularity is shown by their continued use as a beef-producing animal that crosses well with other breeds. Bulls are usually docile and easy to handle.



Photo Credit: <http://www.hereford.ca/gallery.php>

Limousin

The Limousin originated in the hill country of south-central France. The cattle range from a golden wheat colour to a deep red-gold or black, darkening somewhat with maturity and age. The Limousin has always been selected for its meat qualities. Referred to as the “carcass breed,” Limousins do well in carcass competitions with their large rib eyes and high yielding, quality, lean carcass.

Cows are also noted for their calving ease and mothering ability. Limousins were introduced into Canada from France in late 1968.



Photo Credit: <http://www.limousin.com/resources/photo-galleries/>

Maine-Anjou

The Maine-Anjou is one of the largest breeds of cattle in France. They were developed in Brittany when stock that existed in the area before 1850 were crossed with imported Shorthorns to produce a superior animal. The breed is large, polled or horned, and is dark red or black, usually with a white underline and often with small white patches on the body. The appeal of this breed to cattle producers is their high growth rate, milking ability and good disposition. Lean carcass quality and high cutability also put them in demand.

The breed was first imported into Canada in 1968.



Photo Credit: <http://livestockpedia.com/cattle/maine-anjou/>

Shorthorn

The Shorthorn originated in the counties of Durham, Northumberland and York, England. First importations into Canada took place in 1825. The Shorthorn has been called the Foundation breed since it has been used in the development of 30 or more exotic breeds throughout the world.

Shorthorns may be red, white, roan or any combination of red and white. Cattle are either horned or polled. The breed acquired a reputation for hardiness, mothering ability, and good temperament. The major development of the breed has been for beef production, although dual-purpose herds for milk production are being maintained.



Photo credits: Canadian Beef Breeds Council www.canadianbeefbreeds.com and <http://www.albertashorthorn.com/photo-gallery/>

Simmental

The Simmental originated in Switzerland during the Middle Ages. Although developed as a triple purpose meat/draft/milk animal, they are now considered a dual purpose milk and meat producer. Simmentals range in colour from light tan to dark red or black, sometimes with white markings on the head, behind the shoulders, belly, legs and flank. They can be horned or polled.

Simmentals are noted for their muscling, high growth rate and high milk production. Simmental cows usually wean heavy calves due to their high milk production and the breed's high growth potential. First imports into North America were in 1967.



Photo credits: Canadian Beef Breeds Council www.canadianbeefbreeds.com

OTHER BREEDS OF BEEF CATTLE IN ONTARIO

There is limited availability of purebred seed stock from the breeds listed in this section due to the small number of breeders and purebred stock in Ontario. Several of the breeds are used in crossbreeding programs for specific traits. The double-muscled breeds are often bred to the low end of dairy herds to increase meat yield and marketability of veal calves. Breeds known for their calving ease can be used on heifers, and include Salers, Murray Grey and Galloway. If considering one of the following breeds it is important to understand where they fit in the Ontario market, what market opportunities are available and whether or not seed stock can be located and purchased.

Belgian Blue

Belgian Blues are the third largest and perhaps fastest growing beef breed in Great Britain. First introduced to Canada in 1976, it is one of the highest yielding beef breeds. The breed's attributes include double-muscling, fine bones and quiet temperament. Dairy producers are making use of Belgian Blue semen to raise beef-type calves from the bottom end of their dairy herds.

Chianina

The Chianina breed of cattle is of ancient origin, going back to the Roman era when they were used as draft animals. These cattle derive their name from the Chiana Valley in Italy. It is one of the largest breeds of cattle in the world with weights up to 4,000 lbs. The animals are tall, long-legged, long bodied and heavy. Mature bulls are 6 feet tall and are higher at the back. They have white hair and black skin, and adapt well to hot climates.

Chianina are noted for rapid growth rate, leanness, high dressing percent and calving ease. First importation into Canada occurred in 1971.

Galloway

Galloway is an older breed, developed in southwestern Scotland. They have not experienced the extreme breeding for type that other breeds have. They were originally imported from Britain into Canada in 1861.

Three separate breeds of Galloway exist; Galloways, Belted Galloways and White Galloways. They are registered in the same herd book but in 3 separate sections. Three colours are registered: black, dun and red. All Galloways are polled and are noted for their hardiness, maternal traits, calving ease and foraging ability. Their double hair coat allows them to thrive year round in the harshest climates, requiring minimal shelter.

Highland

Highland cattle originated in the Highlands and west coastal area of Scotland. They were first imported into Canada in the 1880's. The breed is horned and can be black, brindle red, yellow, white or dun in colour.

The breed will survive and reproduce under extreme climatic and poor grazing conditions. It is known for its browsing ability. The double coat consisting of a downy undercoat and long outer coat that can reach 13 inches is well oiled to shed rain and snow. They are slow maturing and noted for longevity.

Murray Grey

The Murray Grey cattle originated in Australia and were introduced into Canada in 1969. The breed resulted from the chance mating in 1905 of a light roan, nearly white Shorthorn cow to a purebred black Angus bull, producing a calf that was silver grey in colour. The same cow produced 12 calves, all grey, by various Angus bulls. From 8 females of these naturally polled grey calves the colour remained dominant in their progeny although Angus bulls were used exclusively.

The breed has a reputation for calving ease, mothering ability, hardiness and a docile temperament. They are easy keepers, can finish on grass and have a high carcass cutability.

Parthenais

The Parthenais breed existed in Western Europe for hundreds of years with the official French herdbook being established in 1893. The Canadian herdbook was established in 1993 following the first importations of embryos and semen in 1991. Parthenais are docile, reddish buckskin cattle with black pigmentation. They are highly productive, fertile producers known for their high cutability and heavily-muscled carcass.

Piedmontese

The Piedmontese is considered a double-muscled breed, which is native to only a small section of northwest Italy in the Alps. Importations into Canada were delayed because the national breed association in Italy refused to sell breeding stock until 1980.

Piedmontese are fawn in colour, gradually turning white with black skin pigmentation. The breed is considered to be fully double-muscled, with none of the difficulties traditionally associated with this characteristic, and are noted for their quality, lean carcass, high cutability and calving ease.

Pinzgauer

The Pinzgauer belongs to a group of European cattle breeds that are indigenous to the Alpine regions of Austria. They are considered a dual-purpose breed. The first Pinzgauers arrived in Canada in the early 1970's.

The hair colour of the Pinzgauer cattle is chestnut brown having a range of light to dark brown with a clearly defined white stripe of varying width along the back and loins. The breed is of medium size, horned, with a gentle temperament. Pinzgauer are known for their longevity, fertility and mothering ability.

Red Poll

Red Polls existed as a prehistoric breed in Europe. The Danes introduced them into England. Two strains, the Norfolk and Suffolk, were crossed in 1808 to combine fleshing qualities and milking qualities, respectively. This was the origin of the Red Poll breed that was introduced into Canada in the early 1880's.

The breed is red in colour, small to medium in size and polled.

Salers

This breed was developed in south-central France in the rough mountain region of Salers. The cattle are a solid, deep cherry red, varying somewhat in intensity and horned. A small number are black and polled animals are rare. Salers were first brought into Canada in 1972.

Salers were originally bred for milk, meat and draft purposes. The breed now is primarily raised for meat production. They are known for their maternal qualities of easy calving and milk production and their ability to forage and tolerate extremes in climate.

South Devon

The South Devon breed was developed in the southern part of Devonshire, England. Originally a draft type these cattle were selected for both milk production and fleshing quality during the 19th century.

South Devons are the largest of the English and Scottish breeds. These cattle are a solid bright yellowish red, varying slightly in shade and often having a somewhat mottled appearance. The cattle are horned and noted for hardiness, good milk yield and their lean carcass quality.

South Devon cattle were introduced into Canada in 1969 direct from England.

Tarentaise

The Tarentaise is one of the old breeds indigenous to the Alpine regions of southeastern France. It is a hardy, well-adapted mountain type that has survived to the present without any particular infusion of other breeds.

Tarentaise are a moderate-sized animal, early maturing and usually reddish tan in colour, with dark pigmented skin. The breed is horned and has been primarily selected for milk production, although they have been selected for beef characteristics since their importation into Canada in 1972.

Welsh Black

The Welsh Black are descendants of cattle raised and domesticated in the rugged Welsh mountains of ancient Britain before the Roman Conquest in 55 B.C.

Welsh Black cattle are medium in size, horned, black in colour and have thick soft and fairly long hair that is shaggy in winter. They are known as a maternal breed with gentleness, hardiness, milking ability and foraging ability.

The first Welsh Black were purchased in the U.S. in 1968 and the first direct importation from Wales was in 1971.

Breeds of Beef Cattle



Aberdeen Angus



Belgian Blue



Blonde d'Aquitaine



Charolais



Dexter



Galloway



Gelbvieh



Hays Converter



Hereford



Highland



Limousin



Lincoln Red



Maine Anjou



Murray Grey



Parthenais



Pinzgauer



Salers



Shorthorn



Simmental



South Devon

Aberdeen Angus

Origins: Originated in the Highlands of Scotland when early breeders selected primarily for quality of the carcass and meat. The breed first came to North America in 1876 and the first purebred calf was born in Ontario at the Guelph Experimental Farm in 1877.

Quality traits: Recognized for quality carcasses and maternal strengths of the cows.

Weight of bulls: 2400 to 2600 lbs.

Weight of cows: 1400 lbs.

Appearance: May be either red or black and are always one solid colour. Naturally polled (born without horns).

Belgian Blue

Origins: Third largest breed in Great Britain. First introduced to Canada in 1976.

Quality traits: Noted for its quiet temperament.

Weight of bulls: 2700 lbs.

Weight of cows: 1650 lbs.

Appearance: Colour varies from white, blue roan or black. Some also have a red factor. Animals have double-muscled carcasses and are all born with horns.

Blonde d'Aquitaine

Origins: Originated in southwest France and date back to the sixth century. Today's breed is a combination of the Garonnais of the plains, Garonnais of the hills and the Blonde des Pyrenees.

Quality traits: Crosses well with other breeds, is heavily muscled, and yield a high percentage of lean meat. Cows are known for ease in calving.

Weight of bulls: 1900 to 2300 lbs.

Weight of cows: 1100 to 1500 lbs.

Appearance: Range in colour from a solid wheat shade to darker shades with lighter rings around the eyes and muzzle, on the inner sides of the legs and under the belly and shins.

Charolais

Origins: Came from France and was the earliest European beef cattle import to Canada.

Quality traits: Proven adaptable to a wide range of environments. Grow rapidly and have good muscling. Widely used in crossbreeding with other breeds.

Weight of bulls: 2500 lbs.

Weight of cows: 1600 to 2000 lbs.

Appearance: White to cream coloured, either horned or polled (born without horns). Have medium to large frames.

Dexter

Origins: Originally natives of the south and southwest districts of Ireland. The breed was in Canada prior to 1900 but has become more popular since 1977.

Quality traits: Well used to roaming shelterless hillsides with sparse forage. Their small size makes them easy to handle and their smaller cuts of meat have also proved popular. In Canada, they are classified as a dual-purpose breed – for both meat and milk.

Weight of bulls: 1000 lbs.

Weight of cows: 800 lbs.

Appearance: Smallest purebred dual-purpose breed of cattle in the world. Can be black, red or dun. All purebreds are horned.

Galloway

Origins: One of the older breeds of cattle, originating in Scotland. They were imported from Britain to Canada in 1853 and are believed to be one of the oldest registered breeds in Canada.

Quality traits: Noted for their hardiness, maternal traits, ease in calving and feed foraging abilities.

Weight of bulls: 1500 to 2100 lbs.

Weight of cows: 1050 to 1600 lbs.

Appearance: Basic colours are black, dun, red. Belted Galloways come in the same colours but have a wide white belt around their stomachs. All are polled (born without horns).

Gelbvieh

Origins: Evolved in the early 19th century through the crossing of various breeds in Bavaria. In Germany, the breed was developed for both milk and meat production although emphasis in recent years has been on meat production. The breed has been in Canada since 1972.

Quality traits: Reputation for having a good size and heavy muscling. Known to have desirable carcasses.

Weight of bulls: 2300 to 2800 lbs.

Weight of cows: 1400 to 1800 lbs.

Appearance: Solid in colour ranging from reddish gold to russet. Breed has fine, dense hair.

Hays Converter

Origins: First breed developed by a Canadian livestock producer – Senator Harry W. Hays of Calgary Alberta. Registered in December, 1975.

Quality traits: Fast-growing cattle adapted to range conditions of Western Canada.

Weight of bulls: 2300 to 2800 lbs.

Weight of cows: 1250 to 1500 lbs.

Colour: Usually black with some white markings.

Occasionally can be red and white.

Hereford

Origins: Originated in England and is one of the oldest and most numerous of breeds.

Quality traits: Extremely hardy, has good growth potential and calves easily. Bulls are docile and easy to handle. Crosses well with other breeds.

Weight of bulls: 2200 to 2300 lbs.

Weight of cows: 1300 to 1500 lbs.

Appearance: Reddish-brown in colour with white on the head and chest. A white face is a dominant characteristic. Animals can be horned or polled (born without horns).

Highland

Origins: Originated in Scotland and was first imported to Canada in the 1880s.

Quality traits: Will survive and reproduce under extreme climates and poor grazing conditions. A double coat is well oiled to shed rain and snow.

Weight of bulls: 1300 to 2000 lbs.

Weight of cows: 900 to 1400 lbs.

Appearance: Most common colour is brindle red but can also be black, yellow, white or dun in colour. Animals are horned.

Limousin

Origins: Originated from the Limoges Valley in France and was first imported to Canada in 1969.

Quality traits: Referred to as the "carcass breed" and is selected for meat qualities. Known for calving ease and maternal instincts.

Weight of bulls: 2200 to 2400 lbs.

Weight of cows: 1400 to 1600 lbs.

Appearance: Most commonly, colour ranges from a golden wheat colour in the females to a deep red-gold in the males. Black animals are also growing in popularity. Full blood animals can be either horned or polled (born without horns).

Lincoln Red

Origins: Originated in Lincolnshire, England.

Quality traits: Well muscled, noted for easy fertility and calving, has excellent milk production and docile temperament.

Weight of bulls: 1800 to 2450 lbs.

Weight of cows: 1300 to 1500 lbs.

Appearance: Animals are a solid, deep cherry red colour and are often polled (born without horns).

Maine Anjou

Origins: Originated in France. First imported to Canada in 1968.

Quality traits: Traditionally recognized for high growth rates, good milking abilities and good dispositions.

Weight of bulls: 2200 lbs.

Weight of cows: 1500 lbs.

Appearance: Cattle generally have dark red and white colour patterns and can also be black or solid red. Traditionally, horned but polled (born without horns) and scurred (born with small horns) animals have also developed.

Murray Grey

Origins: Originated in Australia resulting from a chance mating of a Shorthorn cow to a purebred black Angus bull producing a calf that was silver grey in colour. Introduced to Canada in 1969.

Quality traits: Reputation for calving ease, maternal instincts, hardiness and a docile temperament.

Weight of bulls: 2200 to 2500 lbs.

Weight of cows: 1200 to 1600 lbs.

Appearance: Silver grey in colour.



Parthenais

Origins: The French Parthenais Herdbook, established in 1893, is one of the oldest in France. Parthenais were originally a three-fold use breed, used for "oxen", meat and milk. The first embryos were imported to Canada in 1991.

Quality traits: Calving difficulties are minimal. Animals have an excellent rate of gain and have high cutability carcass qualities. They are very docile and cross well with other breeds.

Weight of bulls: 1800 to 2200 lbs.

Weight of cows: 1300 to 1600 lbs.

Appearance: Tan/buckskin colour and must have black pigmentation around the eyes, ears, nose, tail, hooves and genitals for full-blood status. They are also a heavily muscled breed.

Pinzgauer

Origins: The breed belongs to a group of cattle indigenous to Austria and first arrived in Canada in the early 1970s. In Austria, they are used for both milk and meat. In Canada, they are used strictly as beef cattle.

Quality traits: Medium size with a reputation for a gentle temperament.

Weight of bulls: 2000 to 2400 lbs.

Weight of cows: 1300 to 1600 lbs.

Colour: Generally chestnut-brown in colour but can range from light to dark brown. A clearly defined white stripe of varying width can be found along the back and loins. Animals also have a white rump and tail and are generally horned but, on rare occasions, can also be polled (born without horns).

Salers

Origins: Breed developed in south central France and first appeared in Canada in 1972.

Quality traits: Known for maternal qualities of easy calving and milk production. Have good dispositions and are recognized for their ability to forage for feed and to tolerate extreme climates.

Weight of bulls: 2000 to 2500 lbs.

Weight of cows: 1300 to 1500 lbs.

Colour: Purebreds are generally a solid, deep cherry red in colour and are horned. A small number of animals are black.

Shorthorn

Origins: Originated in England and first appeared in Canada in 1825.

Quality traits: Called the "Foundation breed" because it has been used in the development of a number of other breeds throughout the world. Has a reputation for hardiness, strong maternal instincts and a good temperament.

Weight of bulls: 2300 lbs.

Weight of cows: 1200 to 1400 lbs.

Colour: May be red, white, roan or any combination of red and white. Can be either horned or polled (born without horns).

Simmental

Origins: Originated in Switzerland during the Middle Ages where it was used for both milk and meat production. In the rest of the world, the breed is primarily raised for meat.

Quality traits: Heavy muscling combined with the length and weight of the breed gives a high percentage of prime cuts without an excess of fat.

Weight of bulls: 2200 to 2800 lbs.

Weight of cows: 1400 to 1650 lbs.

Appearance: Range in colour from a light tan to dark red with white markings.

South Devon

Origins: Developed in Devonshire, England and is recognized as being the oldest of the English breeds.

Quality traits: Noted for its hardiness and excellent marbling (marbling refers to the fat particles contained within the muscle fibres that affect the meat's juiciness).

Weight of bulls: 2200 to 2600 lbs.

Weight of cows: 1400 lbs.

Colour: Bright yellowish-red in colour and can vary in shade. Can be either horned or polled (born without horns).

Note: Weights are mature weights.

Poster produced by the Beef Farmers of Ontario
130 Malcolm Road, Guelph, Ontario N1K 1B1
519.824.0334 | www.ontariobeef.com

*Background Photo: David Barr
Bull photos and facts courtesy of individual associations.*

FACTORS TO CONSIDER WHEN PICKING A CALF

Selecting a calf may require some “homework”. If you are thinking of purchasing or borrowing a project calf, you should spend even more time making your choice. You should be sure to speak to an experienced herdsman before choosing a calf. He or she might be able to give you some useful tips. It is always a good idea to consult with at least one or two people who are not related to the animal in any way. You might also speak to several other “resource people” who might be able to give you information about places to look for a calf. People who work in the industry, such as personnel at a local custom abattoir or butchers, large animal veterinarians, professional fitters, or breed association offices will probably be able to provide lists of breeders in your region who would be knowledgeable about purchasing or borrowing an animal.

After you have decided the breed and type of project calf that you want, you will have to find one that suits your needs.

When evaluating a group of calves with the goal of selecting one calf for your project, any possible project animals should meet the requirements on this checklist:

- The calf is healthy.
- It is the right size that you want to work with and will grow to the size that you require for your project goals.
- It is the right sex.
- It has been dehorned, castrated, dewormed, vaccinated, tattooed or pre-conditioned in whatever way you require.
- The calf is of the breed or breed-type that you want.
- The calf has whatever “records” you require (sire EPDs, dam records, if it is registered, it should be tattooed and have registration papers).

Once you have found a group of animals that satisfies these criteria, your next task will be to choose the one from the group that will best fulfill your goal for the project. Whether you are looking to work with a market animal or a breeding animal, evaluating the conformational structure of a calf will come down to three factors; muscle, structure, and balance.

Ideal project animals will show good muscling through exhibiting adequate base width at the ground between their rear legs, definition of muscling through the loin, and width through the hind quarter from stifle to stifle. They will also exhibit soundness in their structure, with smooth angling of the shoulder, and free and cushioned movement about their feet and legs. The ideal project animal will also be well balanced, showing consistent depth of body from front to back and straightness about their topline and underline.

The final factor to consider when selecting your project animal is its behaviour. It is vital that you and your project animal be a good team. Choose a project animal whose disposition is a good match for your skills and preferences. Your project calf must be accessible to you, in order for you to spend as much time with it as possible and that time must be enjoyable for you both.

Do it!

One easy way to check for soundness in feet and legs is to examine the stride of the animal. A sound-moving animal should have their rear foot step into the footprint of the front foot on each side. Either at your club meeting or at home, walk a trained beef animal and examine its stride. Is it a sound animal?

ACTIVITY #1 GOAL SETTING

Do

Time: 15 minutes

Materials:

- Goal Setting Worksheet
- Pens

Instructions:

Before anyone can select an ideal project for their beef project, they must have an idea about what their end goal for their project and for themselves will be.

Members have a Project Goal Setting Worksheet in their record books. Help them work through this sheet, using examples from below as needed.

Goals should follow the SMART formula, being Specific, Measurable, Achievable, Relevant, and Timely.

In this activity, members will develop one long-term goal. Examples of a long-term goal might be...

- To incorporate their 4-H project animal into their breeding herd as a producing 2-year old before the beginning of the following year's project year.
- To market the bull calf from their cow/calf project as a breeding animal by the conclusion of the project.
- To finish in the top five at a given show in either showmanship or conformation classes.
- To sell their market steer for a specific amount of profit at Achievement Day.
- To learn about a specific aspect of the beef industry and present their knowledge at a local event.

In order for them to achieve their long-term goal, members will need to develop mid-range goals that will build toward the long-term goal. Members will be asked to note two mid-range goals. Examples of mid-range goals might include...

- Ensuring that their breeding heifer is bred on time to deliver a calf on the desired date the following year.

	<ul style="list-style-type: none"> - Developing a marketing plan for their calf, including research on sales that might be open to consignments by mid-way through the project. - Having a well-known judge come to coach them on showmanship skills or to evaluate their animal and give suggestions for improvements after their first show. - To talk with industry professionals about the subject matter that the member has selected for their project by their third meeting. <p>Members' pre-cursors to their mid-range goals will be short-term goals. They will be asked to note three short-term goals, all of which will be their focus for the beginning of the project. Examples of short-term goals might include...</p> <ul style="list-style-type: none"> - Watching their breeding heifer for a heat cycle and selecting a bull to mate her with. - Halter breaking the bull calf. - Working with their project heifer 4 times per week for showmanship practice and hair training. - Halter breaking their steer. - Selecting a topic for their research project.
<p style="text-align: center; font-weight: bold; color: white;">REFLECT</p>	<p>Learning Outcomes:</p> <p>To develop a set of goals that will be helpful to members in completing their project and that will contribute to helping them select the right project to suit those goals.</p>
<p style="text-align: center; font-weight: bold; color: white;">APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Have members who are comfortable share their goals with the group. - Why is important to set long term goals? - Why is it important to set mid-range and short-term goals? - Did this activity help you to plan for your project? - Suggest that members develop a plan for how to select a project animal/topic that will help to fulfill their goals.

GOAL SETTING WORKSHEET

Throughout my beef project this year, I will be working on a...

- Market Heifer/Steer Project**
- Breeding Heifer Project**
- Cow/Calf Project**
- Carcass Market Beef Project**
- General Research Project About the Beef Industry**
- Other (Please Specify _____)**

It's time to set some SMART goals...

Make sure that your goals are Specific, Measurable, Achievable, Relevant, and Timely.

One long-term goal I have for my project is:

(Long-term goals are ones that will be completed in the distant future. For example, before next year's beef project)

In order to complete my long-term goal, I will need to complete these mid-range goals:

(Mid-range goals are ones that will be completed by the time you are half-way to your long-term goal)

1. _____

2. _____

In order to complete my mid-range goals, I will need to complete these short-term goals:

(Short-term goals are ones that will be completed by the time you are half-way to your mid-range goals)

1. _____

2. _____

3. _____

**ACTIVITY #2
BREAKING RECORDS**

<p>DO</p>	<p>Time: 10 minutes</p> <p>Materials:</p> <ul style="list-style-type: none"> - Breaking Records Worksheet - Pens <p>Instructions:</p> <p>Discussion: Record keeping is an important part of monitoring a beef herd.</p> <ul style="list-style-type: none"> - Have members complete the Breaking Records Worksheet, with help from older members as needed.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To introduce the concept of Record Keeping.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Why is record keeping important? - Do you find record keeping easy or difficult?

BREAKING RECORDS WORKSHEET

Record keeping is an important part of looking after and keeping track of cattle.

Fill in the chart below.

My 4-H Animals for the Year _____

Type of Project Animal	
Tag	
Birthdate	
Breed	
Breed of Sire	
Breed of Dam	
Tattoo	
Birth Weight	
Project Start Weight	
Project Finish Weight	
Breeding Date	
Type of Breeding	
Sire	
Preg Check Date	
Birth Date	
Calf Birth Weight	
Sex	
Tag/Tattoo	

Credit: Manitoba Beef Resource

**ACTIVITY #3
MATCH MY ORIGIN**

DO	<p>Time: 10 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- Match My Origin Worksheet- Pens <p>Instructions:</p> <ul style="list-style-type: none">- Have members complete the worksheet.- Take up the answers as a group.
REFLECT	<p>Learning Outcomes:</p> <p>To reinforce members' knowledge regarding the origin of different breeds of cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Did you learn something new when working through this activity?- Was this a hard activity? Why or why not?- Have you changed your mind about which breed you would like to work with based on this activity?

MATCH MY ORIGIN WORKSHEET

Match the breed on the left with the country or region of origin on the right.

Breed	Origin
Angus, Shorthorn, Luing, Galloway and Highland	Southern United States
Charolais, Limousin, Salers and Maine Anjou	Wales
Hereford, South Devon	Germany
Simmental	France
Gelbvieh	Australia
Hays Converter	Switzerland, France and Germany
Murray Grey	Scotland
Pinzgauer	Canada
Longhorn	Austria
Welsh Black	England

MATCH MY ORIGIN WORKSHEET ANSWER KEY

Breed	Origin
Angus, Shorthorn, Luing, Galloway and Highland	Scotland
Charolais, Limousin, Salers and Maine Anjou	France
Hereford, South Devon	England
Simmental	Switzerland, France, and Germany
Gelbvieh	Germany
Hays Converter	Canada
Murray Grey	Australia
Pinzgauer	Austria
Longhorn	Southern United States
Welsh Black	Wales

Credit: 4-H Alberta

ACTIVITY #4
WHO AM I BREED ACTIVITY

DO	<p>Time: 10 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- Who Am I Worksheet- Pens <p>Instructions:</p> <ul style="list-style-type: none">- Have members complete the worksheet.- Take up the answers as a group.
REFLECT	<p>Learning Outcomes:</p> <p>To reinforce members' knowledge regarding the characteristics of different breeds of cattle.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Did you learn something new about a breed that you surprised you?- Did this activity help you to decide which breed you would like to work with for your project animal?

WHO AM I WORKSHEET

Answer the question "Who am I?" Fill in the breed that corresponds to the description.

1. I often have horns. I am red and white, and am one of the oldest and most common breeds in Canada.

Who am I? _____

2. I have one of the largest gene pools in the world. I range in colour from tan to dark red and have white markings. I come from five different European strains.

Who am I? _____

3. I originated in Scotland some 250 years ago. I came to Canada in 1825. I can be red, white or roan.

Who am I? _____

4. I was imported from France in the 1960's. I am used primarily as a terminal breed in crossbreeding programs. I traditionally have dark red and white markings.

Who am I? _____

5. I am noted for my heavy muscling and lean, high yielding carcass. I came to Canada in 1969.

Who am I? _____

6. I was introduced to Canada in 1860. I can be black or red. My polled gene is dominant when crossed with other breeds.

Who am I? _____

7. I am noted for my maternal traits. I came from France to this country in 1973. I have a thick curly red coat.

Who am I? _____

8. I am one of the oldest French breeds. I have developed a polled gene which now represents 30% of all animals registered. My association has been operating the

Conception to Consumer program since 1968. I can be white to straw coloured.

Who am I? _____

9. I was the first breed to be developed in Canada by private interests. The foundation stock was selected under Alberta range conditions.

Who am I? _____

10. I was brought to Canada from the Southern United States. My horns can grow up to seven feet, that's 210 cm, across. I am often bred to first calf heifers because of my ease of calving.

Who am I? _____

WHO AM I WORKSHEET ANSWER KEY

In case you, the leaders, did not find all of the answers to this exercise, here they are.

1. Hereford
2. Simmental
3. Shorthorn
4. Maine-Anjou
5. Limousin
6. Angus
7. Salers
8. Charolais
9. Hays Converter
10. Longhorn

Credit: 4-H Alberta

ACTIVITY #5
THE SELECTION CHECKLIST

<p style="text-align: center; font-size: 2em; color: white;">DO</p>	<p>Time: 20 minutes</p> <p>Materials:</p> <ul style="list-style-type: none"> - Project Selection Checklist Worksheet - Pens <p>Instructions:</p> <ul style="list-style-type: none"> - Have members bring a copy of the Project Selection Checklist Worksheet with them as you visit a farm with four animals who might make a possible project animal for a member. - Have a senior member share their goal sheet with the group, to use as an example for what the group will look toward as a goal for this activity only. - As a group, fill out the checklist for each possible project animal and use that to make a selection for which animal would be most suitable for the end goal.
<p style="text-align: center; font-size: 2em; color: white;">REFLECT</p>	<p>Learning Outcomes:</p> <p>To develop skills in problem-solving, critical thinking, and process-building and to develop and fill out a checklist to select the project animal/topic that will be most beneficial for each member.</p>
<p style="text-align: center; font-size: 2em; color: white;">APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Do you feel more comfortable now in choosing a project animal? - Do you feel well equipped to be able to ask the right questions when choosing an animal? - Have members take the worksheet home to evaluate which animal is best for them.

PROJECT SELECTION CHECKLIST WORKSHEET

In order to select the best Project for us, we need to ask ourselves some questions about the animal itself. An animal's history and previous management will affect how the animal will grow, develop and generally maintain its overall health in the future. When building a comprehensive history of an animal, producers consider the following:

Date of Birth/Age Verification. Ask for an age verification certificate and make sure the certificate matches the tag number.

Weaning. Ask when the animal was weaned and what it weighed at weaning.

Breeding Considerations. Will the animal's dominant breed traits help to meet your cattle and beef production goals? If you're considering a purebred animal, ask to see a copy of the registration papers.

Castration. For a steer, determine when it was castrated and what method was used. Be sure to check that its castration was done properly and is in fact complete.

Horns. Check to see if the animal is horned, dehorned or polled. If the animal is not polled, ask when it was dehorned and what method was used. Inspect the head for any regrowth. If there is regrowth, will the process need to be repeated?

Health. Observe to see if the animal is alert and active. Does it have a good appetite? Is the hair coat smooth and shiny? Does the animal have bright, clear, eyes? Are the ears upright, not drooping? Does the animal drink the water provided? Is the manure and urine normal for its age? Is there evidence of disease or parasites? Is the animal too fat or too thin? What is the current weight of the animal?

Vaccinations and De-Worming. Ask for a record of both.

Disposition. Is it calm and comfortable around people and other animals or does it seem agitated? What is its positioning in a corral?

Implants. Ask if the animal received any growth implants. If so, with what product and when?

Circle the answer that best suits the animal that you are evaluating.

Date of Birth (DOB) / Age Verification			
- Does the animal meet the age requirements for the project?	Yes	No	
- Is there proof of age available for the animal?	Yes	No	
- Is the animal of an ideal age for fulfilling the long-term goal of the project?	Yes	No	
Weaning			
- Has the animal been weaned?	Yes	No	
- Should the animal be weaned?	Yes	No	
- What was the weaning date?	_____		
- What was the weaning weight?	_____		
Breeding Considerations			
- Is the animal a purebred or crossbred?	Purebred	Crossbred	
- If crossbred,			
- What are the major breed influences?	_____		
- Will this cross's traits help meet your project goals?	Yes	No	
- If purebred,			
- Will the breed's traits help meet your project goals?	Yes	No	
- Are there registration papers for the animal?	Yes	No	
- Is the animal of the ideal breeding for the desired outcome/goal?	Yes	No	
Castration			
- If selecting a steer, when was it castrated?	_____		
- What method was used to castrate?	_____		
- Is there evidence that castration was complete?	_____		
Horns			
- Is the animal horned, dehorned or polled?	Horned	Dehorned	Polled
- When was the animal dehorned?	_____		
- What method was used to dehorn the beef project animal?	_____		
- Is there any regrowth, and if so, will the process have to be done again?	_____		

Health

- Does the animal look healthy? Yes No
- Is the animal alert? Yes No
- Does it have a good appetite? Yes No
- Is the animal active? Yes No
- Is the hair coat smooth and shiny? Yes No
- Does the animal have bright, clear, eyes? Yes No
- Are the ears upright, not drooping? Yes No
- Does the animal drink the water provided? Yes No
- Is the manure and urine normal for the age of the animal? Yes No
- Is there evidence of disease or parasites? Yes No
- Is the animal either too fat or too thin? Yes No
- What is the current weight of the animal? _____

Vaccination & Deworming

- Is there a record of vaccinations and deworming available? Yes No

Disposition

- What is the beef project animal's disposition? _____
- How does the animal behave? _____
- Is the animal calm and comfortable around people and other animals? Yes No

Implants

- Has the animal received a growth implant? Yes No
- If so, with what product? _____
- When was it implanted? _____

Conformation

- Does the animal show good muscling, with adequate base width at the ground between their rear legs, definition of muscling through the loin, and width through the hind quarter from stifle to stifle? Yes No
- Does the animal exhibit soundness in their structure, with smooth angling of the shoulder, and free and cushioned movement about their feet and legs? Yes No
- Is the animal well balanced, showing consistent depth of body from front to back and straightness about their topline and underline? Yes No

Credit: 4-H Alberta

ACTIVITY #6
RANK THE SELECTION FACTORS

DO	<p>Time: 10 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- Rank The Selection Factors Worksheet- Pens <p>Instructions:</p> <ul style="list-style-type: none">- Have your members rank the factors from most important to least important independently.- Once they have completed their individual ranking, have them partner up and discuss their individual rankings, to come to a consensus on a ranking as a pair.- Have each group share their rankings, coming together as a whole club to make a club ranking.
REFLECT	<p>Learning Outcomes:</p> <p>To aid members in developing critical thinking skills and to give members an idea which characteristics are most important to consider when choosing a project animal.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Why is important to consider various factors when selecting an animal?- Why are some factors more important to consider than others?- Did this activity help you to feel more confident in selecting an animal?

RANK THE SELECTION FACTORS WORKSHEET

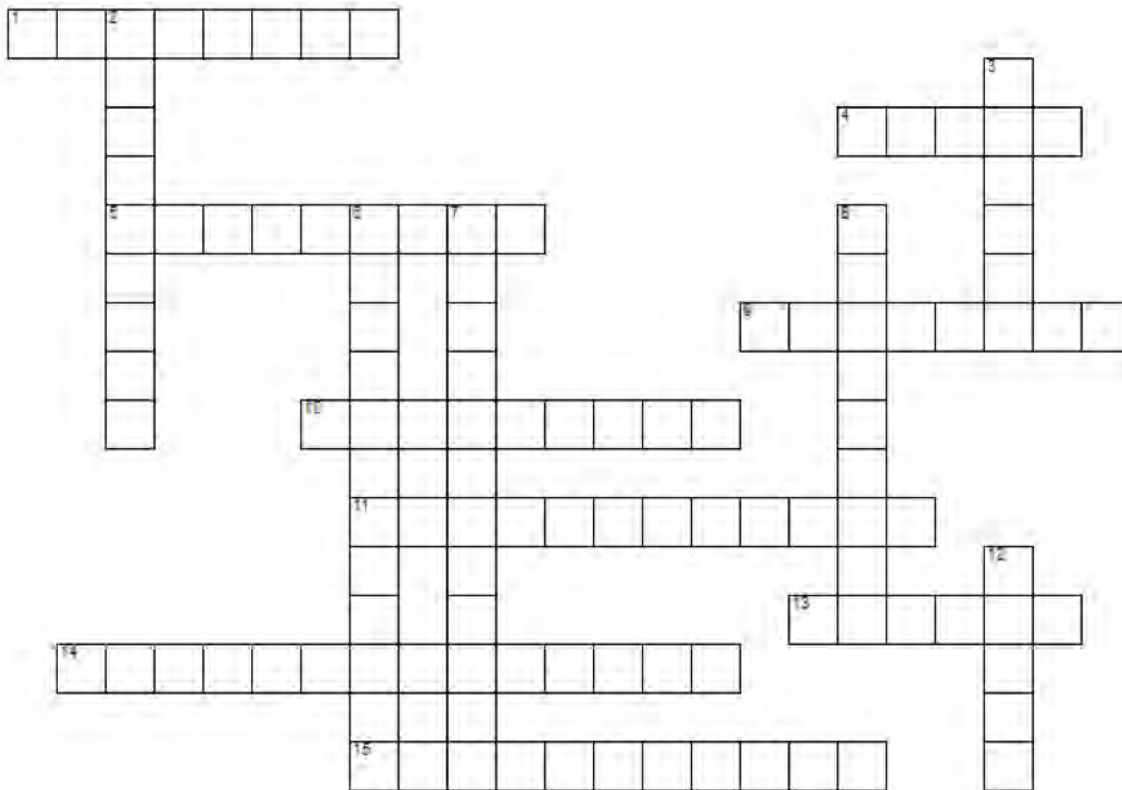
There are many factors to consider when selecting a project animal. Rank the following factors from most important to least important.

<u>Factor</u>	<u>Individual Ranking</u>	<u>Pair Ranking</u>	<u>Club Ranking</u>
Muscling	_____	_____	_____
Straight Top Line	_____	_____	_____
Sound Legs	_____	_____	_____
Breed	_____	_____	_____
Health	_____	_____	_____
Disposition	_____	_____	_____
Age	_____	_____	_____
Depth of Body	_____	_____	_____
Angle of Shoulder	_____	_____	_____
Pedigree	_____	_____	_____

ACTIVITY #7
BEEF SELECTION CROSSWORD

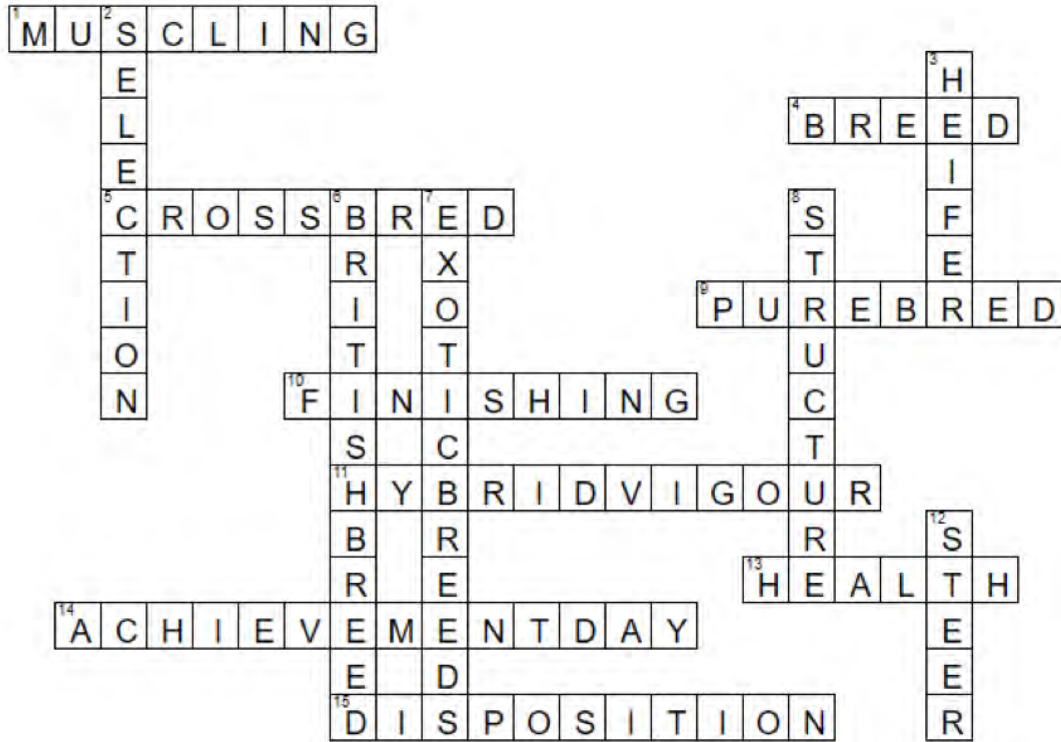
DO	<p>Time: 10 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- Beef Selection Crossword Worksheet- Pens <p>Instructions:</p> <ul style="list-style-type: none">- Have members complete the worksheet.- Take up the answers as a group.
REFLECT	<p>Learning Outcomes:</p> <p>To reinforce members' knowledge regarding the selection of beef animals.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Was this activity easy or hard?- Did you learn something new while doing this activity?

BEEF SELECTION CROSSWORD WORKSHEET



ACROSS	
1.	Exhibiting width through the loin, rear legs, and hind quarter contribute to showing good...
4.	The origin of an animal.
5.	An animal whose genetic makeup includes more than one breed.
9.	An animal that is registered to belong to one breed.
10.	The process of feeding a market animal to be ready for harvesting.
11.	The factor that sometimes makes crossbred calves stronger, healthier, and quicker to grow.
13.	The most important factor to consider when selecting a specific animal.
14.	The event at which you will present your project.
15.	An animal's attitude.
DOWN	
2.	The process of choosing a project animal.
3.	A yearling or calendar year calf project.
6.	Hereford, Shorthorn, Angus, Galloway
7.	Charolais, Limousin, Maine-Anjou
8.	Animals with good _____ exhibit smooth angling of the shoulder and cushioned movement about their legs.
12.	A market animal that has been castrated.

BEEF SELECTION CROSSWORD ANSWER KEY



Credit: 4-H British Columbia

AT HOME ACTIVITY

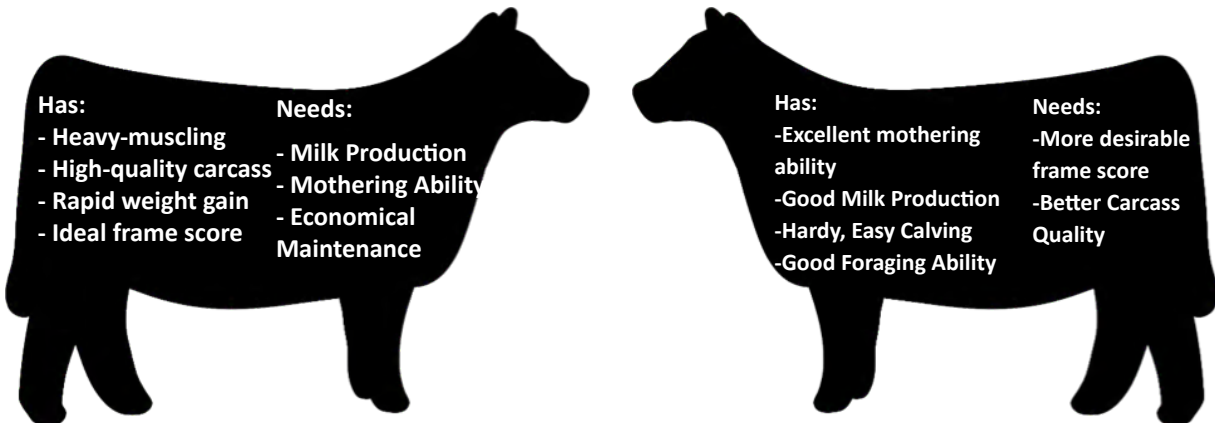
Visit a breed of cattle that you are not familiar with. Do some research online about the breed and (where possible) contact the breed association to get in touch with a local breeder. Develop a list of questions to ask them about their breed and plan an outing to go and see them. Make notes on what strengths you observe the breed to have and share your findings with your club.

DIGGING DEEPER SENIOR MEMBERS

CROSSBREEDING

Beef farmers often combine two or more breeds to create crossbred cattle. Certain good points about one breed will blend well with good points of another breed.

For example:



The other advantage of crossbreeding is that crossbred calves are often strong, healthy and quick growing compared to purebred calves. This is called “heterosis” (or “hybrid vigor”). Crossbred cows may have better fertility, calving easy and mothering ability than purebred cows. A good crossbreeding program will be carefully planned so that it takes advantage of “heterosis”. For example, crossbred cows will be kept as breeding stock because of their superior mothering abilities.

DIGGING DEEPER:

Take a look at some information on various beef breeds to develop your own crossbreeding program. Be sure to research breeds that you are not currently familiar with and look at common strengths and weaknesses of each.

Research 3 bulls from Artificial Insemination catalogues to mate with your 4-H heifer or another heifer from your herd, all from different breeds. Assess the strengths and weaknesses of the female and her possible bull partners. Take your findings to an upcoming meeting, to play a beef club version of ‘The Dating Game’ with your fellow members, in an attempt to find the ideal match for your heifer.

SECTION 7B: CLIPPING & FITTING

SETTING OBJECTIVES

When considering exhibiting animals for a show, the preparation of the animal is a key factor in the overall success of the exhibitor. This meeting will introduce members to clipping and fitting in beef animals in order to ensure that they have successful and rewarding experiences while exhibiting beef cattle.

Suggested Lesson Outcomes

- To aid in having members feel comfortable preparing their animal for show.
- To help members understand what work needs to be done with an animal before they begin to clip or fit.
- To offer tips and tricks to members for clipping and fitting.
- To aid in members' understanding of the tools of the trade.

REFERENCE MATERIALS IN THIS SECTION

- Before You Clip or Fit
- Tools of the Trade
- Hair Training
- Clipping Basics
- Fitting Basics

ACTIVITIES

- Activity # 1 Tour of a Showbox
- Activity #2 Show Supply Scavenger Hunt
- Activity #3 Which Way Do We Go? Hair Training
- Activity #4 Measure Twice, Cut Once
- Activity #5 Cut and Paste
- Activity #6 Brush/Comb Evaluation

SAMPLE MEETING AGENDA – 3hours, 45mins

Welcome, Call to Order & Pledge		10 min
Topic Information, Discussion	Before You Clip or Fit Tools of the Trade	15 min
Activities Related to Topic	Activity #1 Tour of a Showbox Activity #2 Show Supply Scavenger Hunt	45 min
Topic Information, Discussion	Hair Training	15 min
Activities Related to Topic	Activity #3 Which Way Do We Go? Hair Training	15 min
Topic Information, Discussion	Clipping Basics	30 min
Activities Related to Topic	Activity #4 Measure Twice, Cut Once	20 min
Topic Information, Discussion	Fitting Basics	30 min
Activities Related to Topic	Activity #5 Cut and Paste Activity #6 Brush/Comb Evaluation	30 min
Wrap up, Adjournment & Social Time!		10 min
At Home Activity	Practice Clip	5 min

BEFORE YOU CLIP OR FIT

When it comes time to think about preparing your project animal for a show, it doesn't matter what animal you have selected, you will always find that the work that you do at home will benefit you in the presentation of your animal.

Preparation for a show begins weeks and months in advance of you hitting the ring. Every effort that you can make to ensure that your animal has been properly prepared through training and maintenance will pay off in results in the long run. Beginning a maintenance routine early and sticking to it throughout the season, makes it easy to get into the habit of spending time with your animal and making it look its best. These routines can include things like hair training (rinsing, drying, and brushing), clipping, conditioning, etc.

TOOLS OF THE TRADE

Becoming an expert clipper and/or fitter does require the use of some tools. As you start out, borrowing from friends where possible is always a good idea. This will allow you to develop your own tastes for your favorite types of equipment before making financial commitments. Remember to always treat your equipment carefully, especially if it has been borrowed. Keeping track of equipment at a show can be difficult as many people have the same items. Be sure to mark your own items if possible and keep them visible and tidy.

Some common show supplies are listed below. There are thousands of products on the market and this is only a small sampling.

A Flexible Hose



A good hose with a nozzle of some sort is a must for washing and watering your calf. You will want to ensure that you have a decent length that will stretch as long as you might need it to, but that is not so long that it will get tangled easily.

A Wash Pail



Plan to have a small bucket that you use only for washing your animal. If you try to use the same bucket that you water your animal with, they will not likely want to drink out of it after it has had soap in it.

Animal Shampoo



A good animal shampoo will save a lot of time in the wash rack. There are lots of brands available, and you will find that you develop a favorite. Ensure that you always opt for animal shampoo and not dish soap, as dish soap will strip oils from the animal's hair.

Brushes



There are many different types of brushes that are commonly used in working with beef animals. In general, you will want to stick to a stiff- bristled option like a plastic curry or a rice root that will easily move hair.

A Scotch Comb



The Scotch Comb or Tail Comb is the right-hand tool for anyone working with beef cattle. There are several different models of combs, including skip-toothed, fluffing, plastic, etc.; all are good for different uses, but the standard comb is a great starter. This is the tool you will want on hand for working with your animal at every stage, from hair training, to clipping, to fitting, to the show ring.

Conditioners



Beef cattle require conditioning of their hair to keep it looking its best. There are leave-in rinseable conditioners to use when you are finished washing, spray-in conditioners, foaming conditioners, etc. All of the types are useful in different ways.

Electrical Cords



Cords with a multi-plug end on them are handy, so that you can plug in multiple items at once. Be sure to use cords that are intended for outdoor use and limit the number of items that you run off one cord or outlet so that you do not blow breakers. You can never have too much extension cord length, but make sure that your cords are not a tripping hazard for passers by.

A Blower



One of the bigger investments, but handiest tools you will acquire for working with beef cattle, is a good blower. You will want to opt for a dual-motored model, with a heater if at all possible.

A Roto Brush



This handy tool is a newer one that professionals are using frequently. Pairing a roto brush with a cordless drill makes for a handy tool in training leg hair.

Flat-Head Clippers



Flat-heads are very useful for clipping heads, briskets, and tails. There are flathead blades now available for smaller clippers with quick-change blades as well.

Sheep-Head Clippers



Sheep-heads are great clippers for cutting through glue and getting the job done quickly. Because they are a little on the heavy side and they take hair off quickly, they are recommended for the experienced clipper.

Quick-Change-Bladed Clippers



It has become very common for clipping enthusiasts to use small sets of clippers that have quick-change blades. These clippers are very versatile, as blades can be purchased that are intended for shaving, blending, fitting, etc.

Adhesives



Adhesives are used as a heavy-duty hair spray, which will hold hair in place when fitting. There are many, many varieties, all of which will have slightly different levels of hold.

Foams



Foams are used as a mousse product when fitting and are great conditioners for cattle hair. They require brushing and blowing into the hide of the animal, and promote hair popping and setting.

Oil



Oils are a great finishing touch to a fitted animal. They are sprayed on the hair and work well for conditioning the hair and making it shine.

Touch-Up Products



Finishing touches on fitting your animal usually include spraying a touch-up product on their hair. This product is designed to disguise any white spots of adhesive or pesky stains on your animal.

Adhesive Remover



It is very important that adhesives be removed from the hair after a show. There are many oil-based products on the market that work well for this. Be sure to read and follow the directions for use and rinse your animal after using these products.

HAIR TRAINING

In order for a beef animal to look its best, its hair should be trained to go in the proper direction and to appear smooth, but full. This is a process that takes time and effort, but aids in overall presentation.

Hair should be trained to go in a forward and upward direction. This creates a look of added length and fullness of body to the animal.

There are several steps in hair training and different people will suggest different ways of doing so. Many people use a four step approach;

Step One: Rinsing/Washing

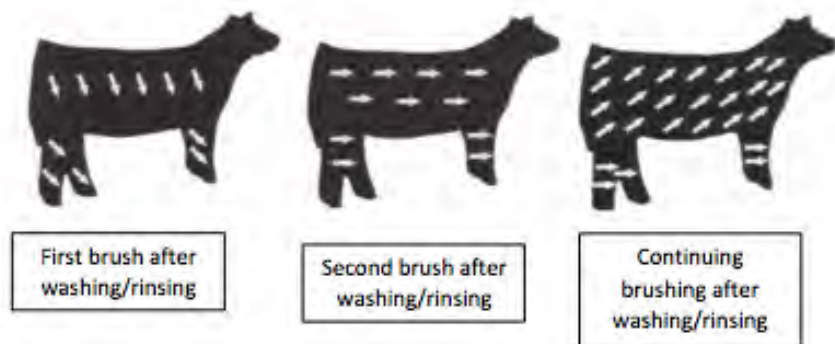
Rinsing the animal daily will aid in hair growth. Many people find it good practice to give the animal a full wash with good animal soap and conditioner weekly as well. Do be careful, though; washing with soap too often will break down the oils in the animal's hair, which is not advantageous.

When washing your animal, be sure to get them completely soaked with water, followed by doing a full-body lather with animal shampoo. Exercise caution when working around your animal's head. Not only do they not enjoy having water on their faces, but beef animals should never have water sprayed in their ears. Be sure to use animal shampoo and not dish soap, as dish soap often includes a degreaser, which will also break down the oils in the animal's hair. Placing a small bit of soap in the bottom of a pail and filling the pail with water and then pouring the diluted soap over the animal's back to cover their body works well. Stubborn stains and dirt can be spot-washed with straight soap. Animals should be rinsed thoroughly as soon as possible once soaped, so that soap does not dry on the animal. Complete rinsing is essential to prevent dandruff. Leave-in animal conditioners are a great aid in hair growth and can be diluted and applied once the animal is rinsed.

Daily rinsing includes a thorough full-body rinse.

Step Two: Brushing

Once an animal is rinsed, brushing or combing their hair straight down and then ahead and upward will aid in evening out the coat. See images below for direction.



Talk About It!

Many people find that rinsing their animal after dark at night, brushing them, and then releasing them into the cool night air during hot summer weather will act as a refreshing lift for their animal and will promote hair growth. Be sure to time this correctly and avoid temperatures that are too cool, so that your animal doesn't catch a chill.

Are there any other tips and tricks for rinsing and washing your animal?

Step Three: Blow-Drying

The blow dryer is the hair-trainer's best friend, when it comes to beef cattle. These heavy-duty machines are very useful for encouraging hair to go in the right direction.

When beginning to dry your calf, it is always recommended to part the hair down their top line with a comb and then follow the natural direction that the tail head hair parts to get it lying in the direction that it will be blown.

As you blow dry your animal, be sure to hold the nozzle firmly and to point the blower away from the ground or any dust that might land on your animal.

Working from back to front is most common, beginning at the animal's shoulder and working your way backward. Ensure that your blower is pointed at an angle to the animal's body that will be successful in blowing the water out of their hair, but will not leave lines in the hair. Pointing the nozzle straight into the animal's body will force the hair to swirl and lines will appear, making your hair-training process unsuccessful. Hold the nozzle close the animal's hide and blow hair forward and up, in the same pattern as you did in the final stage of brushing your wet animal.

When drying an animal's face, exercise caution. Just like washing their face, animals typically dislike having their heads dried. Never point the blower in an animal's ear or nose. Drying is a process that takes time. You want to make sure that every inch of your animal is dry, from the tip of their hair, right down to their hide. Don't forget to get to difficult areas like their brisket and underbelly. Once you think your animal is completely dry, keep blowing for another 10-15 minutes. Leaving the animal's head tied high, so that they are not likely to lie down for a period of time after you have dried them will allow them a chance to continue to dry out.

Step 4 – Brushing and Blowing Some More

When it comes to brushing and blowing your animal, you can never brush or blow too much.

Applying a sheen or conditioner after drying is a great idea. Many of these products will work best when they are blown in after brushing.

Continue to work the hair forward and up at a 45° angle. If it is possible to tie your animal in front of an industrial fan while working hair, you will find that this is helpful. Many professionals now use a roto brush on leg hair to train the hair to go upward. This brush is connected to a cordless drill and does a nice job of moving hair quickly. Exercise caution when starting out with a roto brush near your animal's tail; getting the tail caught in a roto brush is a rookie mistake that you don't want to make.

Experience It!

Whether you are washing, brushing, or drying your animal, it is always a good idea to tie their head up high so that they are not tempted to lie down and they are trained to stand nicely when being worked with. This will also help to train them to naturally hold their head high when you are in the show ring. Never leave an animal that is not comfortably trained to stand unattended.

Practice, or have someone demonstrate, the proper way to tie an animal for clipping and fitting.



When you are at a show, ensure that you blow your animal out and give them a good brush any time they stand up after a rest. This will bring the hair back from being flattened and remove any shavings or straw they may have picked up.

CLIPPING BASICS

Cattle clipping and fitting is a serious business and there are many professionals who prepare animals for the show ring or sales. It takes time to learn how to clip and fit beef cattle properly. The best way to learn is by watching experienced individuals while they work on cattle. Make every effort to watch them at work whenever you can. Pay attention to the products they use while preparing cattle. Observe how they clip, comb and brush. Take notice of how they clip the hair on different parts of the animal's body. There are also many helpful videos and guides available online.

Before you begin to clip, you will want to give some thought as to when the best time to clip your animal before a show will be. As we learned through hair training, the speed to which animals grow hair will vary with the temperature of their environment and many other factors throughout the year. You will always want to avoid clipping too close to show day, as the animal's hair will work best for you when it has had a chance to bounce back a bit, and any mistakes will be hidden more easily with a few days growth. Throughout the summer, clipping a week before your show will work well in most climates. If you find that their hair is growing back too quickly and they are looking a bit shaggy, narrow this time span. Touch-up work can always be done in the days leading up to the show.

The goal for clipping any animal is to make it look its very best. In order to do so, the first step should always be to survey the animal and take note of its strengths and weaknesses. Faults in an animal can be disguised and strengths can be emphasized through a good clip job. Be sure to start with a completely clean and dry animal, whose hair is crushed and combed out to appear just as it would in a show ring. Secure the animal, tied with its head up in a clipping chute or against a wall or gate. Stand back and take a good look at your animal, noting any faults you might see; does your animal's top line have a dip? Are its shoulders angled ideally? These are all good questions to ask yourself, so that you can look toward making the best of your animal. Asking an experienced clipper for an opinion is always a good idea. Every animal is different and requires a slightly different clip job.

When first starting to clip, asking for help from a friend who is experienced can be very helpful. Certain areas of the body are easier to manage than others, and getting your feet wet with those spots is a great way to start. Your clipping buddy can help you determine where to start and can handle the fine details in these challenging spots. They will also be well-versed in the current clipping trends. Like fashion, clipping trends vary from time to time and you will want to stay up to date.

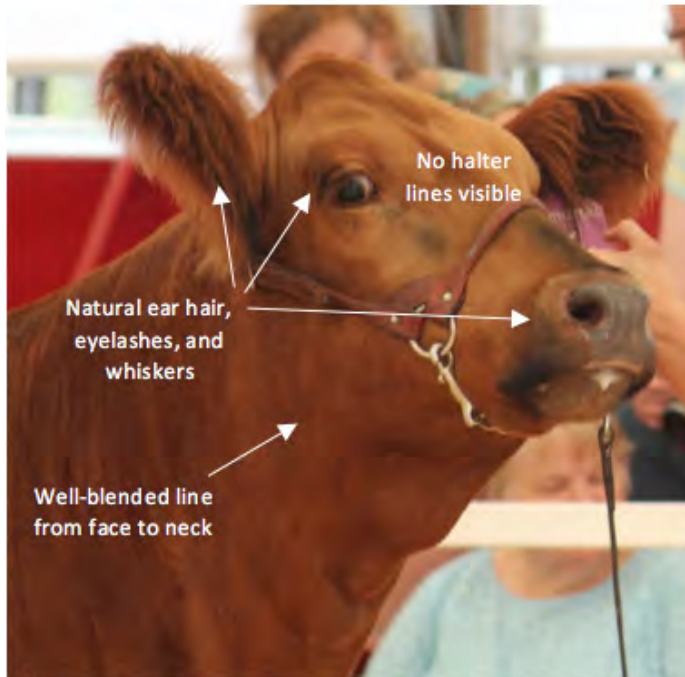
Research It!

Hair training time is great bonding time for you and your animal, especially as you are just starting to train them. Talk to them, feed them snacks, and give them lots of love as you train hair. This will ensure a close bond. What snacks are best to feed while training your animal's hair?

Once you have a set of clippers in your hand and are about to tackle your first clip job, remember that measuring twice and cutting once is not just a good rule in carpentry, it works well for clipping as well. It is very easy to take hair off, but putting it back on if you've made a mistake is nearly impossible. Take small bits of hair off at first, until you get more experience and your comfort level increases.

Clipping Heads

Clipping an animal's head is sometimes the most challenging part of the whole job, because they often are irritated by having their head played with. That said, it is a great job for a beginner clipper, because it is a straight shave. Many clippers recommend clipping the animal's head last, so as not to irritate them from the beginning of the clipping experience. Ideally, you will want to work with a set of flat-head clippers, as they will reach the desired outcome for length of hair and they are no danger to the animal or clipper if the animal should move or shift. Work against the natural grain of the hair growth to shave the entire face, from the snout to the poll and then down along the side of the face to the cheek. Draw a natural line at the cheek bone as a finishing line, ensuring that it is a smooth line that you will blend in to their neck later. Leaving a bit of hair on the poll of the animal is common, as it lengthens out the skull. Be sure to leave eyelashes, nose whiskers, and ear hair intact, trimming only uneven stray hairs. You will also



A properly shaven head Photo Credit, MegB Photography

Do It!

When beginning to clip, it's always a good idea to start out with an animal that is not headed straight to the show ring. Choose a well-trained animal that is not on your show string to start on. That way, if there are mistakes made, they will stay hidden at the farm and not be in the ring.

Practice clipping animals that are not going to the show ring.

want to make sure that the hair under the halter that the animal is wearing is trimmed. Adjust bits of the halter back and forth to make sure that you get it all.

Move from the face, down in an even and smooth panel to the dewlap, and the brisket. It is common to also shave the brisket of the animal. This will lengthen out the neck. Be sure to blend your borders between brisket and neck later.

Clipping Bodies

When it comes to clipping bodies, blending is the name of the game. Using small sets of clippers with interchangeable blades is very common. Using a blending blade throughout the body is a great idea, as it will take off a small amount of hair at a time because the bottom blade of the clipper is set back away from the top blade, making hair have to travel farther onto the blade before being trimmed. Large sheep-head clippers work well, but can sometimes be cumbersome and heavy. This is a great area of your animal to observe an experienced clipper working with before taking on the challenge yourself.

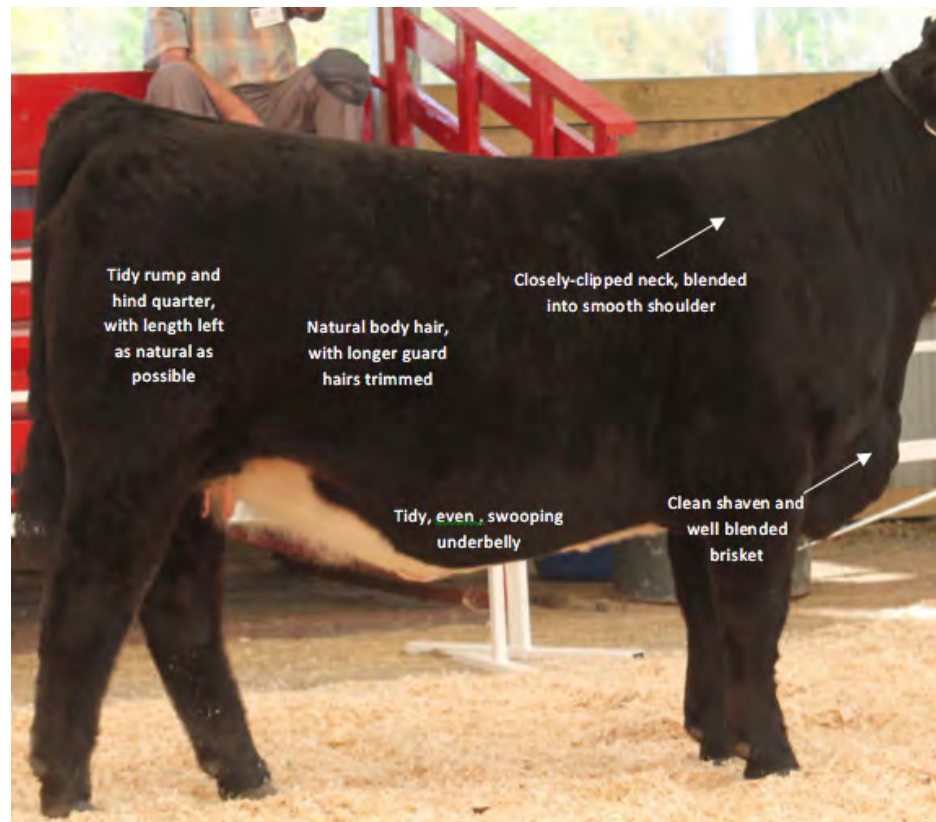
Beginning at the animal's neck and shoulder, you will want to work interchangeably with your clippers and comb, taking off only small bits of hair at a time. Clipping with the grain of the hair, to ensure that you do not take off too much hair at a time is a great idea for beginners. The crest of the neck should be clipped into a straight line, moving naturally toward the poll. Other neck hairs will want to be clipped fairly close to the hide, to give the appearance of a clean and long neck.

Your animal's shoulder is a sensitive spot when it comes to possible areas of fault. You will want to take more hair off in areas that appear to bulge and invade a smooth and angled presentation.

As you work toward the ribcage and mid-section of your animal, ensure that you leave hair long and take off only stray guard-hairs throughout the body. This will help aid in creating a broad rib with lots of spring.

Underbelly hair should be neatly trimmed, with the goal of appearing square with a slight swoop from the brisket to the navel, and then exhibiting a natural slight sweep upward toward the flank.

Rump and hind quarter hair should be tidy and free from guard hairs. The emphasis through these areas should be to bring out the muscling of the areas with fine cuts of meat. It is common to leave hair in these areas long, where possible, and to use that hair for fitting when show day comes.



*A neat and tidy body clip, exhibiting smoothness from the shoulder into the body.
Photo Credit: MegB Photography*

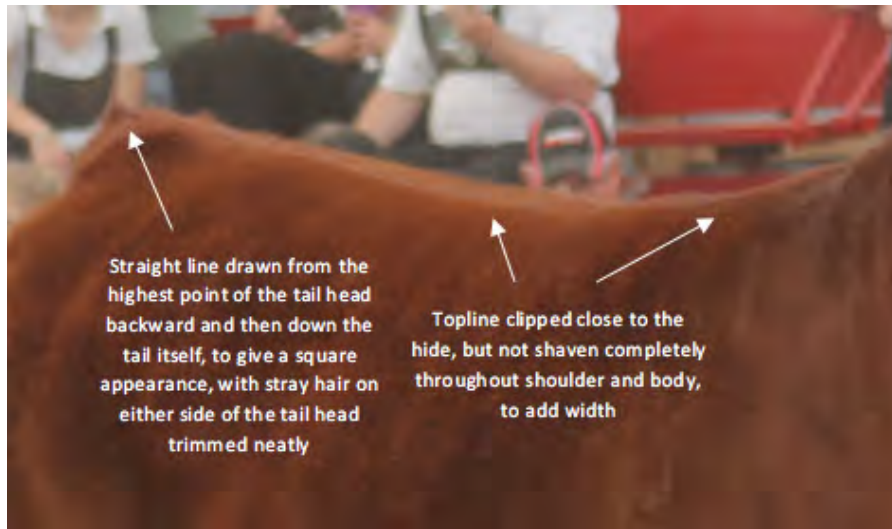
Clipping Toplines

The topline of your animal is another sensitive area. Many animals have natural dips in their topline, and your goal will be to even out those dips by leaving hair longer in low spots and clipping it shorter in high areas. An equally important goal is to make the topline appear wide. Width can be achieved through ensuring that the topline is clipped short throughout the loin and top of the shoulder.

The tail head of an animal's topline is one of the important areas on your animal to clip with care. Any dips in the tail head should be disguised through leaving hair longer, and a straight and square line should be drawn from the highest point on the animal's tail head, backward toward its tail and then down the tail bone itself. Any longer stray hairs to the sides of the tail head should be trimmed and tidied. Fine-tuning of the clipping of the tail head should be left until show day, once the animal has been fitted.

Fun Tip:

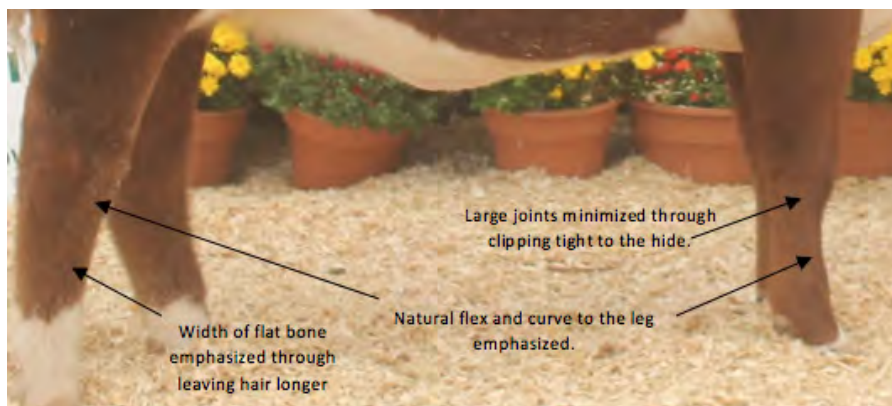
Show animals are conditioned to enjoy having their bellies or briskets scratched with a show stick. This is a comfort to them and they generally react by calming when they are scratched. When you are clipping or fitting, have a buddy scratch your animal's belly to keep them happy.



Straight line drawn from the highest point of the tail head backward and then down the tail itself, to give a square appearance, with stray hair on either side of the tail head trimmed neatly

Topline clipped close to the hide, but not shaven completely throughout shoulder and body, to add width

Photo Credit: MegB Photography



Large joints minimized through clipping tight to the hide.

Width of flat bone emphasized through leaving hair longer

Natural flex and curve to the leg emphasized.

Photo Credit: MegB Photography

Clipping Legs

The legs of the animal are perhaps the most important structural area and should be clipped with care. The goal in clipping both front and back legs is to have them look smooth, minimizing bulges from bones, with ideal set to the hawk and broadness of bone throughout. Focus on bringing out straight lines as you move down the leg, with a very gradual angle to the rear leg, and from the front knee through to the hoof. Again, leg hair is something that you will want to simply tidy in your clipping job, with the intention of doing fine detail work once the animal is fitted.

Clipping Tails

The tail of the animal is a spot that is not to be forgotten! Tail bones should be tidy throughout, with the top of the tail being clean shaven on the sides using flathead clippers down as far as a couple of inches above the twist. The flat of the bone should be clean shaven from this same point upward, moving outward to create a square shape with the tail head. From the cut-off point above the twist, hair should be left its natural length, with the exception of trimming any stray hairs, and a smooth blend from the shaven area to the longer area is ideal. The switch should be trimmed neatly just below the hocks.



Photo Credits: MegB Photography

FITTING BASICS

Like clipping, fitting cattle is an art form and there are many professionals who make it their life's work. Starting as an assistant to an experienced fitter is a great idea, and developing a relationship with them so that you have a coach to turn to for help is always nice. The best way to learn to fit is to watch experienced individuals do so and then to practice at home.

The timing for when to start fitting your animal is crucial to your success. Once an animal is fitted, you will want to ensure that they do not lie down, as that would ruin your hard work. If an animal is forced to stand for too long after being fitted, they may appear sluggish in the ring or even lay down. Take some time to practice fitting your animal at home before you go to a show. Take note of how long it takes you to fully fit your animal from start to finish with

Communicate It!

When you are travelling to the ring, be sure to take a couple of people with you, especially if you are at a bigger show. People visiting the show often like to stop to ask you questions and may even touch your animal. If you have some extra people with you, they can handle this for you, so that your focus remains on travelling to the ring with your animal and preparing for the class.

Who would you ask to accompany you and your animal to the ring? Why would you choose these people?

the outcome that you desire achieved. Get a grasp on when your animal is likely to be in the ring through watching a few classes or having a buddy keep you informed about how long they seem to be taking. Don't forget to also leave time for your animal to have a good drink of water, to get their show halter on, to get yourself ready to be in the ring, and to travel from your pack to the ring.

Before you begin fitting, you will want to ensure that your animal is completely clean and dry and that its hair is free from any pieces of straw or dirt. It should also have its full-body clip done, so that your focus can be on fine-tuning the presentation of your animal. Tie your animal in a chute or a space that is free from dust and dirt under foot.

Working Body Hair

Use a blower to freshen your animal's hair and apply a conditioning spray and/or foam product. Blow any product into the hide and then go back over your animal with the blower once more to ensure that every hair on its body is going in the desired direction. Be sure to avoid any areas on the animal that you will later be applying adhesive to, as most conditioners include an oil base and adhesive will not stick to hair that has oil in it. Your goal with body hair is to have it pop. Popping means that the hair is developing split-ends, which makes it fuller and fluffier.

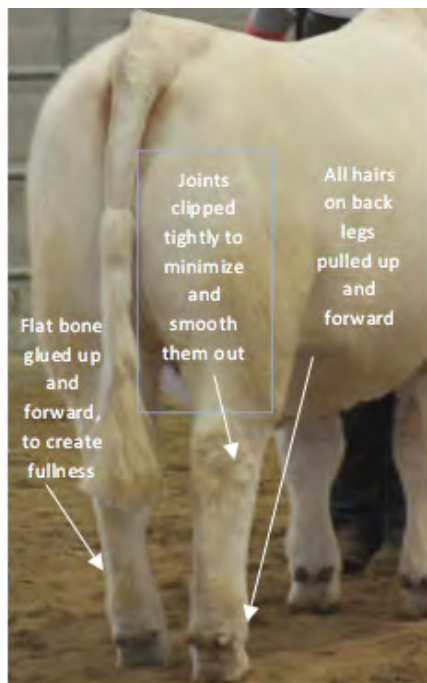
Fun Tip:

When fitting, it's a great idea to put a tail bag over the switch of your animal's tail. This will keep stray tail hairs from getting in the way of any tools you are using.



Fitting Legs

The goal of fitting legs is to enhance the clip job that you have done previously through applying adhesive to hold it in place. Beginning your fit job by using a roto brush on leg hair is helpful in ensuring that every hair on the animal's legs is moving up and forward. Have a friend hold the animal's tail for you or secure it in a tail bag to avoid having it in your way.



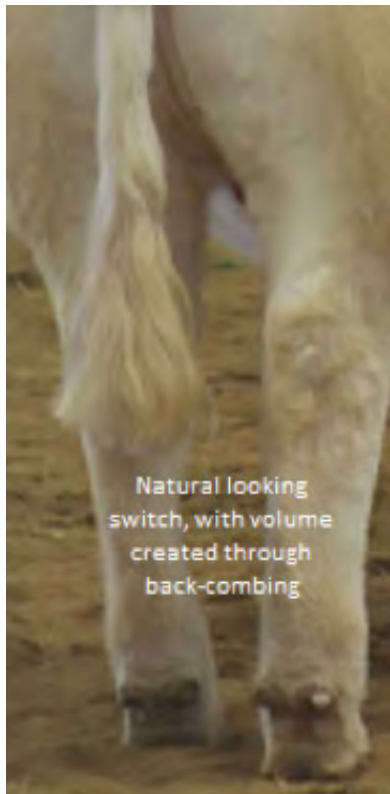
Your goal in fitting legs is to make bones appear wide, straight, and full, with joints minimized and muscling emphasized.

You will want to pull the hair on the legs and hind quarters up and forward with a scotch comb and spray adhesive on it. Be sure to hold your adhesive can an arm's length away from the animal and to apply it in long, sweeping sprays, so that you do not have it concentrated in one small area. Choose an adhesive with a firm hold for this job. Both the inside and the outside of the front and back legs should be glued from the hoof to the brisket on front legs and from the hoof to twist on rear legs. Hair through the hind quarter should be pulled up and glued to emphasize the muscling in this area.

Once you are happy with the application of your adhesive, ensure that it is dry before beginning to work with your clippers. Choose sheep heads or a small set of clippers with interchangeable blades, using a blocking blade to cut through the stiffness of the glue with ease. Shape the legs in the same way that you did when initially clipping the legs, emphasizing straightness and width of bone and muscling, minimizing joints, and evening out any stray hairs.

Fitting The Top Line

The goal in fitting the top line is for the animal's back to appear straight and square. Any stray hairs throughout the animal's top should be clipped while fitting and the tail head should be glued. Adhesive should be applied to make the tail head hairs stand upward, so that they can be clipped to give the animal a smooth, square tail head.



Fitting the Tail Switch

The manner in which a switch is fitted varies from person to person and comes in and out of fashion. In general, switches should be back-combed to appear full and secured with a strong adhesive. The tail ball should not be overly large or distracting and should appear as natural as possible.

**ACTIVITY #1:
TOUR OF A SHOW BOX**

<p>DO</p>	<p>Time: 20 min</p> <p>Materials:</p> <ul style="list-style-type: none"> - A complete show box that includes all of the supplies that a practiced clipper/fitter would take with them to a large show. This is an activity that could be done at a show, or in a trailer at a meeting where a guest or a leader has brought the supplies as a sample. <p>Instructions:</p> <ul style="list-style-type: none"> - Ask that whoever has provided the sample walk the members through the tools that they have brought with them. It is sometimes most helpful to do this systematically, going through the tools in the order in which they would most likely use them. - Have members look through the box itself and how it is put together, asking specific questions about tools that they are not familiar with.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To have members learn about the different tools that fitters and clippers use.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Did you see some new products or items today that you weren't familiar with? - Will you try some new products/items when working with your animal after this activity? - Was it fun to see inside someone else's showbox?

ACTIVITY #2 SHOW SUPPLY SCAVENGER HUNT

DO

Time: 25 minutes

Materials:

- A set of complete show supplies that include the items that a practiced clipper/fitter would take with them to a show. This is an activity most ideally done at a show, or fitting clinic.

Instructions:

- Ask several volunteer exhibitors at the show or event to allow members to borrow items from them for the activity, showing them the list of items before they commit.
- Divide members into groups.
- Give each group a list of items to find and let them know which herd they can gather items from. Encourage creative thinking.
- Arrange for extra volunteers to act as spotters, watching for members who need help to carry things and who might be cheating!
- Rules:
 - » Members may not find items in their own show boxes.
 - » The group must travel together to find each item.
 - » No more than three items can come out of one show box.
 - » Large items must be carried with multiple members to avoid injuries through lifting.
- Give members 15 minutes to locate their items.
- Check all items in on a master list for each team and then allow them five minutes to return the items to where they found them.
- Provide prizes to the team that brings back the most items.

REFLECT	<p>Learning Outcomes:</p> <p>To have members learn about the different tools that exhibitors might bring to a show.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Have a round-table discussion about any items members might have found that they were not familiar with. - Did you see some new products or items today that you weren't familiar with? - Will you try some new products/items when working with your animal after this activity? - Did your team work well together? - How could your team have been more effective?

SHOW SUPPLY SCAVENGER HUNT ITEM LIST

- REGULAR SCOTCH COMB
- FLUFFER COMB
- SKIP-TOOTHED COMB
- PLASTIC COMB
- PLASTIC CURRY
- RICE ROOT BRUSH
- BLOWER
- SHEEP-HEAD CLIPPERS
- FLAT-HEAD CLIPPERS
- BLENDING BLADE
- BLOCKING BLADE
- SCISSORS
- NUMBER HARNESS
- BLACK LEATHER HALTER
- NECK TIE
- TAIL ADHESIVE
- BLACK TOUCH UP
- RED TOUCH UP
- WHITE TOUCH UP
- FINAL BLOOM
- ANIMAL SHAMPOO
- FLY SPRAY
- HOSE
- FITTING CHUTE
- STEEL-TOED BOOTS
- SPRAY BOTTLE
- STALL CARD
- BALE OF STRAW
- BALE OF HAY
- DUCT TAPE
- STAPLE GUN
- END GATE
- SHOW ANIMAL
- SHOW STICK
- PEDIGREE PAPERS
- PAIL
- EXTENSION CORD
- LIGHT ADHESIVE
- TAIL BAG
- RED RIBBON
- FEED TUB
- ADHESIVE REMOVER
- PINK OIL
- HOOF PICK
- SHOW PROGRAM
- SHOW SHIRT
- RUBBER BOOTS
- FOAM
- FIVE-TINED FORK
- SHOVEL
- WHEEL BARROW
- EXHIBITOR SIGN
- EXHIBITOR NUMBER
- FOGGER
- SHOW BOX
- 4 ITEMS WITH A 4-H LOGO ON THEM
- ROPE HALTER
- CONDITIONER
- SHOW SHEEN
- BROWN LEATHER HALTER
- SEMEN CATALOGUE
- RADIO
- THE MOST UNIQUE ITEM

ACTIVITY #3 WHICH WAY DO WE GO? HAIR TRAINING

DO

Time: 15 minutes

Materials:

- One clean and dry animal, ideally with well-trained hair.
- Several Brushes

Instructions:

- Have members grab brushes and work together to brush the hair on the animal down. Ensure that they have covered every area on the animal.
- Discuss what effect brushing the animal's hair down had on the animal's appearance.
- Have members work together to brush the hair on the animal backward, from head to tail. Ensure that they have covered every area on the animal.
- Discuss what effect brushing the animal's hair backward had on the animal's appearance.
- Have members work together to brush the hair on the animal up. Ensure that they have covered every area on the animal.
- Discuss what effect brushing the animal's hair up had on the animal's appearance.
- Have members work together to brush the hair on the animal forward. Ensure that they have covered every area on the animal.
- Discuss what effect brushing the animal's hair forward had on the animal's appearance.
- Ask your experienced members to work together to brush the hair of the animal in the most ideal direction (ahead and up).
- Discuss as a group why this is the most ideal setting for the hair.
- Nudge the group toward observing that properly trained hair does not easily lie in the wrong direction.

REFLECT	Learning Outcomes: To have members learn why it is best to brush their animal's hair a certain direction.
APPLY	Processing Prompts: <ul style="list-style-type: none">- What happened when the hair was brushed down/backward/up/forward?- What direction will you train your animal's hair to lie in?- Why is it helpful to train hair?- What are some less obvious benefits to training hair?

ACTIVITY #4 MEASURE TWICE, CUT ONCE

DO

Time: 20 minutes

Materials:

- One clean and dry animal that is not likely to be shown but is well trained
- Flat-head clippers
- Sheep-head clippers
- Quick-Attach Bladed Clippers
- A Selection Of Quick-Attach Blades

Instructions:

- Have a discussion as a group about the different types of clippers available on the market and show the group each type, passing them around the group as you talk. Pose questions to the group about the observations that they can make on each type of clipper, before even plugging them in.
- Begin by using the flat-head clippers. Have a volunteer use the clippers on the animal, moving in different directions with them.
- Have the group make observations about how the clipper operates and the way it might be used to its best advantage.
- Move on to the sheep-head clippers. Have a volunteer use the clippers on the animal, moving in different directions with them. Note: monitor use to ensure that they are safe, as these clippers are harsher than the flat-heads.
- Have the group make observations about how the clipper operates and the way it might be used to its best advantage.
- Move on to the quick-attach bladed clippers. Again, have a volunteer use the clippers on the animal, moving in different directions with them, using different types of blades. Note: monitor use to ensure that they are safe, as some blades can be harsh.
- Have the group make observations about how the clipper operates and the way it might be used to its best advantage.

REFLECT	Learning Outcomes: To have members learn about the different types of clippers and blades.
APPLY	Processing Prompts: <ul style="list-style-type: none">- Which type of clipper were you most comfortable using?- Which type of clipper is the best overall?- Why is it necessary to have different types of clippers available?- Did you enjoy using different types of clippers?

ACTIVITY #5 CUT AND PASTE

DO	<p>Time: 30 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- One clean and dry animal that is not likely to be shown but is well trained- Sheep-head or quick-attach bladed clippers outfitted with a blocking blade- A selection of six different adhesives- Adhesive remover <p>Instructions:</p> <ul style="list-style-type: none">- Have members work in groups to glue and then clip each leg of an animal using a different adhesive for each leg, another for the tail head, and another for the tail switch. Take caution that not too many members are working with the animal at once, causing it stress and making it consider reacting negatively. Have one member scratch the animal's belly with a show stick to keep it content.- Have each group take 5 minutes to discuss what they like and dislike about the type of adhesive that they used independently.- Have each group share their notes with the whole club and continue discussions and observations.- Ensure that the animal has all of the glue removed from its hair and that it is rinsed.- Note: This activity could be done with different types of foam, different oils, conditioners, shampoos, etc.
REFLECT	<p>Learning Outcomes:</p> <p>To have members learn about the different types of adhesives.</p>

APPLY

Processing Prompts:

- Which type of adhesive were you most comfortable using?
- Which type of adhesive is the best overall?
- Why is it necessary to have different types of adhesives available?
- Did you enjoy using different types of adhesives?

ACTIVITY #6 BRUSH/COMB EVALUATION

DO	<p>Time: 25 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">– A class of four brushes, each labelled with a number, one rice root brush, one plastic curry, one softer bristled brush, and one plastic-bristle brush.– A class of four combs, each labelled with a number, one regular scotch comb, one skip-toothed comb, one fluffer comb, and one plastic comb.– One clean and dry animal. <p>Instructions:</p> <ul style="list-style-type: none">– Let your members know that you will be evaluating the use of different tools. Begin with the class of brushes and have the members take a look at each type as a group. Allow them to use each brush on the animal and to see how the hair reacts to it. Ask that they make notes, as a group, for each type and what they think the strengths and weaknesses are of each type. Have them decide how each brush would be most useful as a group. i.e. rice root brush: ideal for working hair once it is dry on a daily basis; plastic curry: ideal for working product into the hair; soft brush: ideal for cleaning supplies like clipper blades; plastic-bristle brush: ideal for washing.– Have your members go through the same steps with the class of combs. Ask that they note the differences in each type of comb, and that they note one time at which they would use each of the combs. Pair newer members with an experienced member as needed. Have members who are comfortable share their notes.
REFLECT	<p>Learning Outcomes:</p> <p>To develop a good understanding of different types of brushes and combs and each member's preferences and to develop judging and critical thinking practice.</p>

APPLY

Processing Prompts:

- Why is it important to use the right type of brush/comb?
- What did you learn from this activity?
- What are the benefits to trying different tools?

AT HOME ACTIVITY

Pull an animal out of the field/barn that is not normally on your show string, but is well trained, and practice clipping and fitting on that animal. Get a handle on different types of clippers and blades and see which ones are your favorites.

Practice fitting legs and topline using different types of adhesives. See which ones you like best for different areas of the body.

DIGGING DEEPER 1 FOR SENIOR MEMBERS

Clipping and Fitting Through The Years

Clipping and fitting have both changed a lot over the decades. New products are introduced to the industry every year and advancements are made in technology that allow for new fitting practices to be introduced continuously. There are many fitters throughout the Ontario industry that have been working with cattle for decades. Talking with these people and getting to know them will improve your knowledge, and will allow you to get the best of both worlds; yesterday's fitters and the fitters of today.

As new products are put on the market, the temptation to dive in and begin using them without educating yourself is strong. Sales representatives and tutorials are great tools for getting to know new products.

SENIOR MEMBER ACTIVITY:

Get to know some fitters who have been working with cattle for many years. Ask to shadow them for a day on the farm or at a small show and spend the day doing things their way. Be sure to watch as they work with hair and take a look at the tools that they gravitate toward. Then, take some time to immerse yourself in the products that have most recently been released by your favorite supply company. Before you invest in these new products, look them up online and get an idea about how they work and whether they will be worth your while. Talk with a sales rep and ask them about the proper way to use the product.

Coming out of this activity, take some time to evaluate your time with a seasoned fitter and your new knowledge from current products. Develop your own path for going forward, fitting in your own style.

DIGGING DEEPER 2 FOR SENIOR MEMBERS

Mr. Fix It

As we learn to do by doing when it comes to clipping and fitting, we are going to have a learning curve, and there will be times when we make mistakes. As a senior member, the time during which you have made consistent mistakes in clipping may have come and gone. For some of you, it might just be beginning. If you are just starting out, be brave in making mistakes. Know that your mistakes are the best learning opportunities.

SENIOR MEMBER ACTIVITY:

Pair up with a new member, who has not yet done much clipping. Spend a day with them, choosing an animal that is not currently on a show string and having them clip the animal from start to finish. Be their coach, but be sure to let them do the whole job. Allow them to make mistakes and help them learn from them.

Later, once your beginner buddy has moved along, take the same animal on as your project for a day. Take some time to try to fix any spots that might not have been ideally clipped. Try different methods of covering up and working with any problem areas. As you spend some time cutting and pasting and making improvements on the work, be confident in your ability to fix any issues you might make yourself as you go forward.

SECTION 7C: SHOWMANSHIP & SPORTSMANSHIP

SETTING OBJECTIVES

Exhibiting cattle at a show is not just about the visual preparation of the animal, it is also about the way in which the animal is presented in the ring. A good showperson can bring out the best in an animal and those who conduct themselves as good sportsmen will find that they are well-respected in the show industry. This meeting will introduce members to basic best practices for showmanship and sportsmanship, in order to ensure that they have successful and rewarding experiences while exhibiting beef cattle.

Suggested Lesson Outcomes

- To aid in having members feel comfortable participating in a show.
- To help members understand what work needs to be done with an animal before they get to a show.
- To offer tips and tricks to members for showmanship.
- To aid in members' understanding of how to best present their animal.

REFERENCE MATERIALS IN THIS SECTION

- Before You Show
- Showmanship Basics
- Sportsman-Like Conduct
- Presenting Your Herd
- Show Day Routine

ACTIVITIES

- Activity #1 Design a Show-Cattle Handling System
- Activity #2 Halter-Tying Competition
- Activity #3 20 Questions
- Activity #4 Show Ring Practice
- Activity #5 Mock Showmanship Class Judging
- Activity #6 Design a Stall Card
- Activity #7 Create a Packing List

SAMPLE MEETING AGENDA – 4 hours, 40mins

Welcome, Call to Order & Pledge		10 min
Topic Information, Discussion	Before You Show	20 min
Activities Related to Topic	Activity #1 Design a Show-Cattle Handling System Activity #2 Halter-Tying Competition	25 min
Topic Information, Discussion	Showmanship Basics	30 min
Activities Related to Topic	Activity #3 20 Questions	15 min
Topic Information, Discussion	Sportsman-Like Conduct	30 min
Activities Related to Topic	Activity #4 Show Ring Practice Activity # 5 Mock Showmanship Class Judging	60 min
Topic Information, Discussion	Presenting Your Herd	20 min
Activities Related to Topic	Activity #6 Design a Stall Card	20 min
Topic Information, Discussion	Show Day Routine	15 min
Activities Related to Topic	Activity #7 Create a Packing List	20 min
Wrap up, Adjournment & Social Time!		10 min
At Home Activity	Showmanship Practice	5 min

BEFORE YOU SHOW

Showmanship is all about how well you and your animal work as a team and the level of excellence in which you present your animal. Experienced showpeople throughout the world will tell you that ribbons are not won through the work that you do in the show ring; they are won through the work that you do at home to prepare for the show. Whether you are brand new to showing beef cattle or you have been at it for ages, you will find that the amount of homework needed to prepare for a show never changes. Many find that this part of the process is actually their favorite because, in doing this work, you develop relationships with your animals and you come to understand their individual personalities.

Spending quality time at home ensuring that your animal is adequately halter-broken is integral to the success of presenting it for show. Each animal requires different levels of attention and work at home to get it comfortable with having people around it. It is important that you take the time to go about this one step at a time, not rushing your animal and ensuring that it is ready for every step of the process.

Animals are never presented to the best of their ability if they are not properly trained. We all know that, like humans, animals will have bad days and will have moments when their behaviour is not ideal. It is important to minimize these moments in order to get the very best out of your animal.

Halter Breaking

The process of halter breaking is about breaking your animal's bad habits, by encouraging good behaviour and training it to enjoy being worked with. This is a process best completed when

the animal is young, so as to encourage good behaviour from the beginning. It is very important that the animal be worked with regularly (daily or every other day) when it is first being halter broken. This allows it to develop good habits on a consistent basis, remembering the experience from the day before. Ensure that you work with your animal in a cool and dry place. Avoid the heat of the afternoon by working with it in the morning or evening.

Everyone has different ways of halter breaking cattle. You will find your own style as you practice over time. In general, opt for exuding calmness and confidence with gentle hands when training.

When you first begin to work with your animal, you will find that it is likely to show signs of agitation with you being around it. Being herbivores and subject to natural prey if left in the wild, cattle are what we call a 'flight' animal. This means that their natural tendency is to move away from anything foreign or intimidating. The first step to your success in halter breaking, will be getting your animal used to you being around it. Spend the first few days bringing your animal into a relatively large enclosure (pen or barn) where it is able to run loose while you move around it. Feed your animal grain and talk to it while it eats its treats. Get it used to the idea that when it comes in and hangs out with you, it gets fed. When you are able, reach out and touch the animal. Be sure to take caution, but aim for touching its top line, working toward scratching its back with your hand or a brush. Cattle love to have their backs scratched. When you are comfortable, try touching its head. This is another spot that cattle generally like to be scratched, but also a spot to be cautious about. A cow's head is one of its biggest tools in fending off enemies. Its natural tendency may be to toss its head at you until it sees that you are a source of comfort. As time goes on, make the space smaller. Starting with a large pen and working your way down to smaller ones makes your calf naturally get used to being closer to you. Some animals can go from a bigger space to a smaller one all in one day, while others will need more time.

Once it is comfortable with having you near it, it's time to try putting a halter on your animal. In a small pen, let the animal smell the halter. Give it a chance to lick it and see it before the halter is on its face. When you are ready, stretch the halter out a bit, so that it will slip loosely over the animal's face and place the halter with the lead shank on the right side of its face, as you are looking at it. Be careful not to pull tight on the halter this first time you are putting it on the animal if at all possible. Hold the end of the halter loosely, letting the animal get used to the idea of having something on its head and move around the pen with it on. Over time, tighten it up to a comfortable tension around the animal's face. Ensure that the halter is placed correctly on the face, to avoid the animal slipping it off or hurting itself.

Check It Out At Home!

Many showpeople suggest putting a halter on an animal that you are beginning to work with, and letting it go back out into the pasture with the halter on. The idea here is that the animal will get used to having the halter on its face and stepping on it, which will naturally tighten and loosen the halter over time. Be sure to examine your halter before doing this to see that there is no danger of it tightening too much and not loosening back up when your animal is no longer stepping on it. Also, check on your animal often when doing this to ensure that it is safe. Try this at home with your animal!



Correct Placement

Nose Strap Too High

Nose Strap Too Low

Photo Credit: https://www.thejudgingconnection.com/pdfs/647_Beef%20Cattle%20Showmanship%20by%20Paul%20Maulsby.pdf

Tying your animal's halter to a gate or wall will be your next step. Be sure to use a slip-knot to secure your animal to an area that is free from obstructions and has a secure foundation. Avoid using a post or any area where the animal might harm itself.

Always tie your animal's head up high and allow it only enough space on the halter to move minimally; tying the animal with too much shank will allow it opportunity to get tangled up.

Once you are able to have your animal tied, you will want to give it a few minutes to get used to the idea of being tied up. Stay close and watch that it is safe at all times as it becomes accustomed to its surroundings. Once it seems to be standing calmly, begin brushing your animal and petting it. Have it smell

Do it!

Wrap vet wrap around the chain of your leather halter for a more comfortable fit for your animal's chin and your own hand. Try this with your leather halter and see what it feels like.

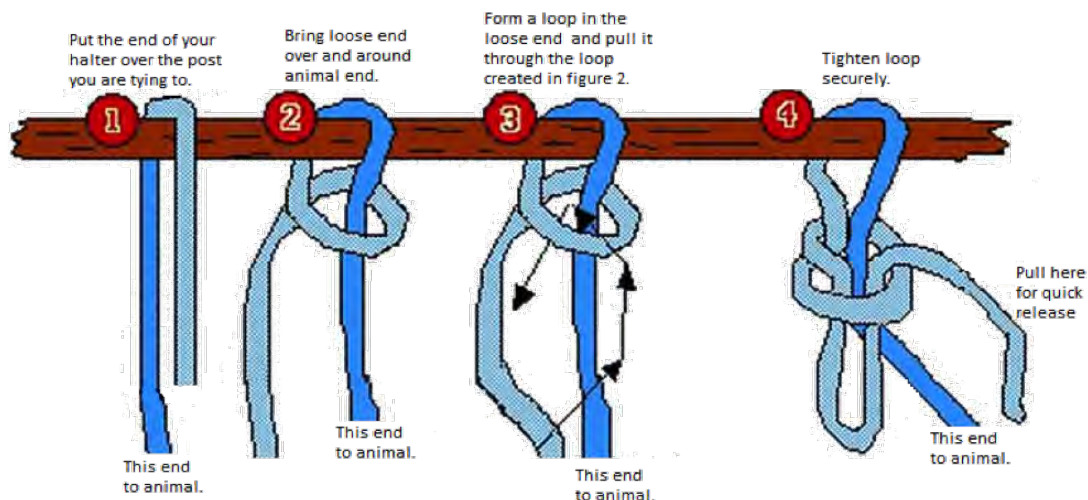


Illustration Credit: <http://animals.mom.me/how-to-tie-up-a-horse-2226091.html>

the brush and your hands to get used to the scent of both. Brush your animal all over its body, taking this quality hair-training time for granted. Talk to your animal calmly and get it used to hearing your voice.

It may take a few days for you to be able to brush your animal's whole body without it being nervous. Take your time creating a bond that you are both comfortable with. This is also a great time to introduce it to a show stick. Let it smell the stick and then scratch its belly with the hook of the stick and try moving your animal's feet around with the show stick.

Your next step is beginning to move with your animal. Untie the animal from the gate and stand still with it for a little bit, with your hand 2-3 inches from the animal's face. Scratch its belly with your show stick. When you are ready, take a few steps. Walk slowly, within a small pen, so that if your animal moves too fast, it has limited space to move within. Stop every few steps and scratch your animal with the show stick and your hand. Talk to it calmly and consistently. Work your way up to taking more steps at a time. Try to stop for a break before any bad behaviour starts. Keep your animal's head up and yourself safe at all times. As time goes on, go from the small pen into a larger one, gaining more space gradually.

Once you are moving about a large pen comfortably with your animal, having only rare moments of undesirable behaviour, try taking it for a walk to give it a bath or around its favourite pasture field.

SHOWMANSHIP BASICS

Showmanship is all about making your animal look its very best. Competitors are judged in showmanship classes on how well they present their animal to the judge. While showmanship is all about judging the person, and not the animal, it is always advantageous to have selected an animal that is desirable and to ensure that it is as ready for the show ring as possible. Make sure that your animal is totally clean and dry, and looking its very best. Not only should you know that your animal looks great, but you should also know everything you can about the animal and its history. Be prepared for your judge to ask any number of questions while you are in the ring. It is common to be asked about your animal's birthdate, sire, breeding date, feed program, the agricultural industry, etc. Judges may also ask questions about showmanship itself and the tools that you need to work with your animal.

Before you enter the ring, there are some pieces of equipment that you will need to have with you.

1. **A Leather Show Halter** – When you are exhibiting your animal at a show, a leather halter is considered the formal dress-wear that your animal should be outfitted with. These halters are adjustable and often come with a chain under the chin. Be sure that your leather halter is properly fitted to work on your animal as comfortably as the rope halter does, and that you have practiced at home with a leather halter before the show. Never tie your animal up using a leather halter, as it can easily come undone.

The lead shank of your halter should be 1-2 inches from the ground when you hold the halter with one hand and have your hand properly positioned 1-2 inches from the animal's face. The snap on the chain should be pointed outward.

2. **A Show Stick** – A show stick is the showperson's right-hand tool in the ring. Aluminum and wooden sticks are popular. Be sure to choose a stick that is straight and clean and professional-looking. Your show stick should be long enough for you to comfortably reach the animal's back legs with it, but not so long that it gets in your way.

3. **A Scotch Comb** – A scotch comb is placed in the back-right pocket of any showperson heading into the ring, with the teeth of the comb pointing in toward the showperson. Ensure that your comb is secure in your pocket, where it will be easily reachable if you should need it. Any type of scotch comb will do; a regular one, a skip-toothed, a fluffer, or a plastic one.
4. **An exhibitor Harness or Clip** – You will need a harness or clip for your exhibitor number to be fitted onto for the ring. Some shows will allow either type of accessory, while others stipulate one or the other.
5. **Proper Dress** – Some shows throughout the province have dress codes, which you will want to abide by for any shows you attend. Dark pants are common and should be free from holes. Be sure to check your show’s rule book for these details. You should also be outfitted with solid leather boots, preferably with a steel-toe (just in case your animal steps on your toe). Dress neatly and cleanly and avoid logos on your clothing. Be careful never to wear a hat into the ring or to chew gum.

Arrive for your class a couple of minutes early, so that you and your animal both have a chance to take a breath and relax before the class. When heading into the ring, you always want to be on the outside of the ring, with your animal’s halter in your right hand and your show stick held vertically and stable with the point headed downward in your left. Walk at a slow and even pace in sync with your animal, leaving one animal-length between you and the next animal and make use of the entire ring space.

One of the most important moments in your class will be the first impression that you make on the judge. Look toward appearing calm but confident, with excellent posture and good head carriage of your animal. Proper head carriage is essential in making your animal look its best. Your hand should be 1-2 inches from your animal’s head and its head should be up and alert.

Your attention should be split between the judge, your animal, and the animal in front of you. Do not become distracted by anything on the outside of the ring. Watch for direction from your



judge or ring steward (judge's assistant), and never pass an animal unless directed to by an official.

Your judge will likely have a pattern in which he or she likes their showpeople to work around the ring. Watch a class before your own if you are able, so that you know what to expect. You will be asked to move around with your animal, and also to stop so that the judge can take closer examination of each animal in the ring.

There are two ways in which you might be asked to stop your animal in the ring; head-to-tail or side-by-side. When stopping your animal head-to-tail, you will simply stop with your animal out around the sides of the ring, with your animal's head behind the next animal's tail. When the judge makes the motion for you to stop, you have a few steps before you must land your animal. Choose a spot that is on even ground. Leave at least one animal length between you and the next animal in line. This type of stop is also called a profile, as the judge will be viewing your animal's profile from the inside or outside of the ring. When profiling your animal, you will want to try to walk its feet into the proper placement for the stop if possible. Turn to the inside of your animal to face its rear as you take your last couple of steps, transferring your halter from your right to left hand and your show stick from left to right. Scratch your animal's belly a couple of times and then make any adjustments to the placement of the front feet that you might need, using your own feet to move them.

Proper front foot placement is square, with the inside foot just barely offset backward and feet a comfortable width apart.



Judge It!




Set your animal up on the profile and then ask a friend for their opinion of how the animal looks. Have them take the halter for you, so that you can go and look at the animal from a distance on the proper side. Make adjustments as needed. Practice this with a few friends by asking them to set their animals up while others judge them and give reasons on the class. Then have those who judged take the halters of the animals so the original three or four friends can also see what the animals look like when they are set up and then judge the animals.

To move a front foot, step on the hoof and apply pressure backward on the halter or place your foot behind the dewclaw and pull forward. Once the front feet are in place, adjust the placement of the hind feet as needed. The hind foot that is closest to the judge should be offset a few inches backward from the one that is furthest away. This allows the judge to see the udder of a female animal or

testicles of a male. If your animal has not naturally landed with its hind feet positioned properly, move them using the point or hook of your show stick. Finding the perfect placement for the feet when profiling your animal is a challenge and is different for every animal. The goal should always be to find a spot for the feet where the animal's feet and topline look best.

Try to have you animal set up quickly and ensure that its head is up at all times. As the judge moves throughout the ring, many will expect that you move the hind feet of the animal to exhibit the correct profile at all times. Try to have your animal trained so that it transitions between profiling one side and the other seamlessly, by stepping ahead a step, so that you don't have to use your show stick.

If you are asked to stop side-by-side, ensure that you leave enough room for the judge to pass between animals easily. Set your animal's feet squarely with both front and back feet comfortably placed together.

Placing Front Feet		
		
<p>Too Close The animal appears narrow through the chest floor.</p>	<p>Just Right Enhances the animal's natural volume and capacity.</p>	<p>Too Wide Appears unnatural and unbalanced.</p>




Placing Rear Feet		
		
<p>Too Close The animal appears narrow and the stance detracts from the natural muscling. Also, the feet are not quite square, which enhances the narrowness.</p>	<p>Just Right Enhances the animal's natural muscling and width.</p>	<p>Too Wide Appears unnatural and unbalanced.</p>

Photo Credit: <http://cemonterey.ucanr.edu/files/197369.pdf>

If your animal should shift while standing, feel free to move it around in a small circle, turning toward the inner part of the ring, moving yourself to the right and returning to where you were. Set it up again once you have landed in your new spot. Ideally, your animal should always be straight in line and not have its hips or shoulders pointed inward.

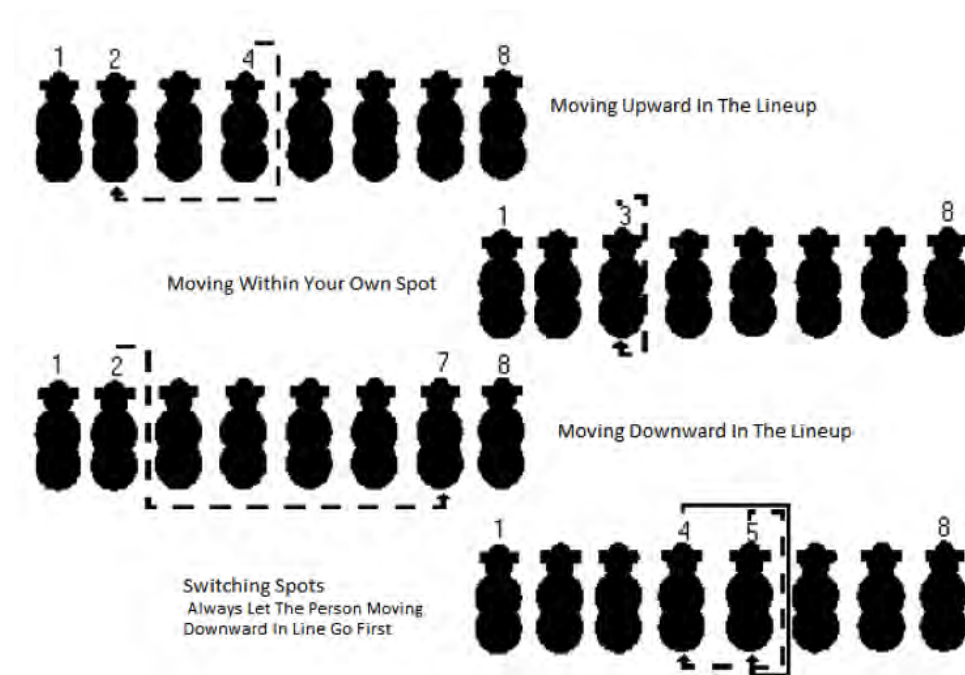
While you are in the ring, be prepared to have a visit with the judge. He or she will likely ask you some questions about yourself, your animal, or showing cattle in general. Be polite, respectful, and friendly and give them the answers that you are best able to. They may also handle your animal. If the judge touches your animal, wait until he or she moves on to the next person and use your scotch comb to comb the animal's hair back into place.

Watch for direction from your judge indicating your spot for placement, and be quick in moving to your spot. Judges often motion for showpeople to move to their spots in line quickly, so be sure to pay close attention. When pulling into place, look for direction from the ring steward or judge as to where and how they would like you lined up. Most commonly, you will line up side-by-side toward the centre of the ring. Leave enough room between you and the animal beside you for the judge to pass through comfortably. If you should need to move your animal while lined up side-by-side (because it has shifted or the judge has asked you to switch places with another animal), take several steps forward, then turn your animal to the right, all the way around and go back through your own spot. Finish by turning to the right to go back into your own spot or

Share It!

Always plan to leave home at least 30 minutes before you think you need to on the morning of the show. You never know what might pop up the day of the event!

Do you have any stories of times when things didn't go quite right on the morning of a show? Why extra time is always a good thing?



by going directly to the new spot you have been assigned in the ring if you were switching spots. As you are waiting to be pulled into line, animals in front of you may go ahead, leaving a vacant spot in the ring. Move your animal ahead by stepping backwards into the vacant spot, so that there are no holes in the line. Once you are lined up, be

Graphic Credit: [//www.thejudgingconnection.com/pdfs/Beef_Showmanship_Guide.pdf](http://www.thejudgingconnection.com/pdfs/Beef_Showmanship_Guide.pdf)

sure to keep showing until the very end of the class. Listen to the judge's comments and try to make adjustments that they recommend before your next class.

SPORTSMANLIKE CONDUCT

It is just as important that participants learn how to be good sportsmen as it is that they learn how to show. While competition is not the focus of 4-H, we do know that many of our members enjoy this aspect of showing livestock. It is healthy to learn how to compete professionally and in a courteous manner.

When it comes to showing beef cattle, there are a few ways in which showpeople can exhibit good sportsmanship. Judges watch for sportsmanlike behaviour and always like to see exhibitors being well-mannered toward others in the ring.

1. Always endeavour to allow room for other exhibitors and to avoid crowding. It doesn't matter whether you are in a large ring with very few animals or a smaller ring with a lot of animals in it, the natural instinct of both cattle and humans is to get close together. This should be avoided at all times. Watch to be sure that you do not edge out another showperson and their animal as you move toward stopping around the ring. If you find that you have stopped too close to them, move your animal so that they can also be seen if at all possible. If your animal is crowded by others in the ring, it is your responsibility to move it so that it can be seen.
2. Assist others when they are in need. Once in a while, animals will stop walking around the ring. If the animal ahead of you stops, nudge it or give it a twist of the tail to help the showperson ahead of you. In the event of an animal getting loose or any other problems in the ring, remain calm and assist as you are able, always making your safety and the well-being of your animal your first priority.
3. Always be professional. Not every day is going to be a day where you end up where you would like to in terms of placement in the ring. It is important to remember that being a good sportsman and acting professionally will pay off for you in the long run. On-lookers at the show will be able to observe any signs of poor attitude, and you never know when a possible judge or employer or a younger member might be lingering at ringside, taking in your behaviour.
4. Congratulate those who do well. Shaking the hand of the first-placed showperson in your class will not only make them feel great, but will show the world that you are professional. Take a minute to touch base with this person as the class ends or shortly thereafter. Some of the closest friends you will have in your life may come from the relationships that you build in the show ring.
5. Speak to the judge. Where possible, take a minute to thank the judge for coming and evaluating your cattle and your skills for the day. This will sometimes bring forward an opportunity for you to learn from them, as they offer you some additional tips.

Above all, remember that you will always be rewarded in life for doing the right thing. Being a good sportsman will pay off in the long run.

PRESENTING YOUR HERD

Part of showing cattle is also being a good herdsman. When you are at a show, you will be assigned a space to tie; sometimes with your 4-H club or sometimes with your own herd. Ensuring that you have a professional-looking display space for your herd, plays a huge part in building your reputation as an ideal exhibitor who cares about the overall presentation and marketing of your animals.

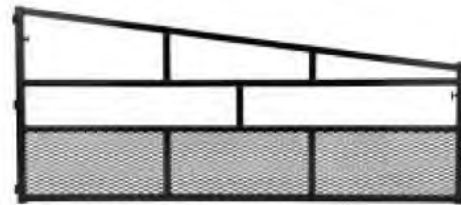
One of the first steps toward building a strong display will be ensuring that the pack the animals stand on is well put together. Packs can be made of straw, shavings, or wood chips. Take a look at the rule book for your show before arriving, so that you know what is allowed for bedding. The pack should be stable and bountiful, leaving the animals a comfortable



Photo Credit: <http://www.findlayanimalscience.com/c-studentactivities.html>

and supportive bed. Angling your pack so that the front end is higher than the back is always a good idea, so that the animals have their front ends elevated. The back of the pack should be neat and tidy, with any stray pieces of bedding being swept up regularly.

It is a great idea to have some sort of end gate or stall divider in place to separate your herd from the one next to it. These are generally metal and can be homemade or purchased. Chains/gates/posts placed in the front of the cattle for use to tie them high are also very common.



 **Eva** 

BORN: **February 23, 2017**

SIRE: **CAS 301A**

DAM: **Red Eye**

Sydney Summers

A sign of some sort, that advertises your herd or club. Include contact information and an eye-catching design. Stall cards for each animal are also great to have in place, so that those touring the barn can easily identify the name, age, sire, and dam of each animal, as well as where they are from. Many exhibitors also choose to hang a curtain or backdrop from which their stall cards are hung.

Your animals should be clean and dry and ready for viewing by the public by the time the show opens to the public. This allows them time to be well-rested for the show as well. As the day

goes on, be sure to continue being a good herdsman, by removing any manure from the bed and keeping animals clean, fed, watered, and happy. Also ensure that supplies are tidy and neat and non-invasive to aisle ways. Be available to the public to answer any questions they might have, and be courteous to all those who travel through the barn.

SHOW DAY ROUTINE

As you get into the habit of attending shows, you will come to see that having a regular routine in place for show day is a great way to keep yourself organized and your animals happy.

You will want to start by having your trailer packed with all of the supplies you will need for the show, packing the evening before if at all possible. Giving your animal a good bath the evening before the show will also allow for things to go more quickly in the morning, with a full rinse and spot wash of any stains. Leave them in a spot for the night where they are able to be comfortable and remain as clean as possible, but are within easy access for loading in the morning.

Take a look at the rule book or website for the show that you are going to attend, and look for what time the event opens to the public. Aim to have your animal(s) settled in their bed before visitors start touring the barn. Work backward from that time through your routine, to arrange for a time to leave home.

Sample Show Day Timeline

- Rise And Shine
- Halter And Load Animals
- Load Last-Minute Supplies
- Drive To Show
- Arrive At Show Grounds
- Find Your Stall
- Unload Animals In A Safe Spot
- Form Bedding Pack And Install End Gates
- Hang Signs
- Wash And Dry Animals
- Feed And Water Animals
- Be Ready To Greet Visitors
- Maintain Animals And Pack
- Prepare For Show

**ACTIVITY #1
DESIGN A SHOW CATTLE HANDLING SYSTEM**

<p>DO</p>	<p>Time: 15 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- Some examples of drawings of handling systems or facilities to tour in person.- Chart paper- Markers <p>Instructions:</p> <ul style="list-style-type: none">- Have a discussion as a group about what sorts of characteristics a good facility for working with show cattle might include. Ensure that the group thinks about what might be needed when halter-breaking, hair training, washing, etc.- Divide the group into pairs or threes and give each group a sheet of chart paper (try to mix more and less experienced members with each other).- Have each group design a handling facility that would be ideal for show cattle. If you like, you can assign each group a different type of facility i.e. one a pole barn, one a coverall, one a corral system, etc.- Give groups 10 minutes to illustrate their system and make notes on chart paper.- Have each group present their facility to the club.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To have members gain knowledge about what types of handling systems are best for working with show cattle.</p>

APPLY

Processing Prompts:

- How well would your design work with your herd?
- What did you see on another group's design that you would like to add to yours?
- Why is it important to ensure that you have an adequate handling facility?

ACTIVITY #2 HALTER-TYING COMPETITION

DO	<p>Time: 10 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- Enough rope halters for one per group of five members.- A gate to tie to. <p>Instructions:</p> <ul style="list-style-type: none">- Separate members into groups of five, ensuring that there are experienced members in each group.- Give each group 5 minutes to have one of their experienced members show the group how to accurately and quickly tie a halter.- Have each group leave their halter tied in a good knot on the same gate at the end of the tutorial.- Have the groups line up one behind the other.- On the count of three, have each group send one member at a time, to the gate to untie the knot and retie it properly before going back to tag the next person in their group. If needed, have an experienced member go with any newer members who might need help and act as a coach.- First team to have all 5 members tie the halter correctly and be seated on the ground back at the starting point wins the round.- Best two of three rounds wins the game!
REFLECT	<p>Learning Outcomes:</p> <p>For members to learn how to tie a proper knot quickly and accurately.</p>

APPLY

Processing Prompts:

- Did your skills in halter-tying improve after having completed this activity?
- Why is it important to tie your animal using a proper knot?
- What other factors should you consider when tying your project animals up?

ACTIVITY # 3
20 QUESTIONS

<p>DO</p>	<p>Time: 15 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- Chart Paper- Markers <p>Instructions:</p> <ul style="list-style-type: none">- As a club, have a discussion about what questions a judge might ask a member in a novice, junior, intermediate, and senior showmanship class.- Make a list of possible questions that the group comes up with for each age division.- Have members note the questions for their age group, and the group next to them advanced in age in their books.- Ask for volunteers to answer each of the questions from within the group, noting that some may not have answers yet.- Ask members to take the list of questions home with them so that they can research or develop answers to each before the next meeting/show.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To have members be prepared to answer questions that the judge might ask them while they're in the ring.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Why is it important for judges to ask questions when judging a showmanship class?- What question would you ask if you were a judge?- Why is it important to know the answers to questions about your project animal?

**ACTIVITY #4
SHOW RING PRACTICE**

<p style="text-align: center; font-size: 2em; color: white;">DO</p>	<p>Time: 30 minutes</p> <p>Materials:</p> <ul style="list-style-type: none"> - Space to use as a ring. - Several animals who have been well halter-broken - Several experienced showpeople to act as coaches <p>Instructions:</p> <ul style="list-style-type: none"> - Divide members into groups based on experience and based on the number of animals that you have available. - Have members select a calf to use for the mock showmanship class. - Ensure that you have an alternate activity for members who are not in the ring to engage in while they wait if possible. - Have several coaches set up to help members and give them individual tips. - Let members know who the judge is that will be evaluating the class. - Run the class as per any normal showmanship class, with coaches assisting members and offering tips as needed. - Have coaches pay special focus and attention on good sportsman behaviours and point out opportunities for members to exercise good sportsmanship.
<p style="text-align: center; font-size: 2em; color: white;">REFLECT</p>	<p>Learning Outcomes:</p> <p>To have members take a turn at practicing their showmanship and sportsmanship skills in a mock class.</p>
<p style="text-align: center; font-size: 2em; color: white;">APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - How did it make you feel to be judged in showmanship and to have a coach? - What did you learn in this activity? - How will you change your showmanship and sportsmanship behaviours after today?

ACTIVITY #5 MOCK SHOWMANSHIP CLASS

DO

Time: 30 minutes

Materials:

- A class of four adult showpeople with animals and all of the supplies they need to participate.
- Paper and pen for each member.

Instructions:

- Have an experienced senior member act as your official judge for the class and one act as a ring steward.
- Ask all of your members to find spots around the outside of the ring to observe the class.
- Have your official judge act as the operating judge for the class.
- Ask that the showpeople operate as though they are at a show, participating in a showmanship class.
- Have the showpeople in the class queued to make some mistakes throughout the class. Depending on the level of experience of your group, have them make more or less obvious mistakes that members will be able to catch and to make moves that are not sportsmanlike.
- Have each member make notes throughout the class on the good and less desirable showmanship and sportsmanship skills that they observe throughout the class. Ask them to use their notes to decide how they would place the class if they were the judge.
- Ask your official judge to place the class once you are comfortable that each member has their own placing.
- Have the official judge give reasons for their placing.
- Allow time for members to share any of the observations that they made and the reasons they agree or disagree with the official placing.

REFLECT	Learning Outcomes: To develop a good understanding about how to evaluate showmanship and sportsmanship skills and to develop judging and critical thinking practices.
APPLY	Processing Prompts: <ul style="list-style-type: none">- What did you enjoy about judging this class?- What did you learn from judging the adults?- How did you place the class and why?

ACTIVITY #6
DESIGN A STALL CARD

DO	<p>Time: 20 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- 4 Sample Stall Cards- 12x18 White Paper- Markers, Rulers, Glue, Construction Paper, Etc. <p>Instructions:</p> <ul style="list-style-type: none">- Have a discussion with members about the information that should be included on a stall card (Name, Date of Birth, Sire, Dam, Exhibitor).- Discuss what makes an ideal stall card (neat and tidy, bold typing, eye-catching, etc.)- Have members judge the samples and share their reasons for their placings if they are comfortable.- Have members create a stall card for their animal using the supplies provided.
REFLECT	<p>Learning Outcomes:</p> <p>To have members gain knowledge of the information they should include on a stall card.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- Why is it important to have stall cards in place in your display?- What is the most important piece of information to include on a stall card?- How can you make your stall card stand out and also look professional?- What is the goal of making a stall card?

ACTIVITY # 7 CREATE A PACKING LIST

DO	<p>Time: 20 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">– Chart Paper– Markers <p>Instructions:</p> <ul style="list-style-type: none">– Divide your members into groups of 4, ensuring that each group has at least one experienced member in it.– Give each group a sheet of chart paper and marker(s).– Assign each group a show that members within your club regularly attend, and develop a packing list. Make sure to include bigger and longer events, with the idea that not every item is needed for every show.– Give groups ten minutes to develop their lists.– Have each group present their list to the club.– Once each group has presented, ask members to look for similarities in the lists. Note any items that appear on every list and prepare a new list, to be titled ‘Master Packing List’. This will allow the members to have a list of items they need for any show, no matter how big or small.– Encourage newer members to arrange to borrow items that they don’t own ahead of time.– Encourage members to take note of the Master List, so that they have it available to them when packing.
REFLECT	<p>Learning Outcomes:</p> <p>To have members feel prepared for a show, with a complete list of the items they will need to have with them.</p>

APPLY

Processing Prompts:

- What is another way that you can prepare ahead of time for a show?
- Why is it important to be prepared for a show before departure?
- How will this list help you in preparing for shows?
- Did you learn about some items that are helpful at a show that you hadn't thought of? What were they?

AT HOME ACTIVITY

Take some time to practice showmanship skills at home. Have a senior member or leader help you by visiting and acting as a judge. If possible, have a friend or parent or a couple of them show an animal as well, to make a mock class. Ensure that the 'judge' walks you through all of the different components of a showmanship class, from beginning to end. Ask that they let you know when they observe you making a mistake or forgetting a detail, and have them give you a hand to learn how to fix it. Practice any of these skills a few times until you feel comfortable that you are ready for the ring!

DIGGING DEEPER 1 FOR SENIOR MEMBERS

Get Ready For Your Close-Up

As a senior member, you are often one of the more experienced showpeople in your club. Senior classes are tough, and the expectation that you will know a lot about showing cattle is strong. Getting the honest advice from mentors who observe your class, and talking with judges about ways in which you can improve your skills, is always helpful, but sometimes it's difficult to visualize what you did and did not do in your class. Likewise, it can be tough to see what others in your class might have done to show that they deserved to place above you in the class. Beyond this, we know that there is always room for improvement, even if you win a class.

Senior Member Activity:

Have a parent or friend take video coverage of you showing your animal. Ask them to get good footage of how you interact with your judge and how you and your animal work together. Take the time to view the video yourself and observe your skills. Leave the video for a day and come back and view it again. Ask a friend or mentor to view it with you as well. Make notes on small things that you observe that you could improve upon, and look toward implementing that behaviour in your next class.

SECTION 7D: ENGAGING WITH THE PUBLIC

SETTING OBJECTIVES

Over the years, the agricultural industry has had to develop in order for farmers to become well-versed in talking with consumers and members of the public in general with regard to where their food comes from. People are curious about how animals on farms are cared for and are sometimes given false information about their treatment from groups who do not support farming. In this meeting, members will gain knowledge with regard to how to speak to the public and how to handle difficult questions.

Suggested Lesson Outcomes

- To educate members with respect to what animal activism entails.
- To increase members' confidence in presenting their animals at shows.
- To arm members with the tools they need to respond to difficult questions from the public.
- To educate members with respect to how to respond to acts of activism.

REFERENCE MATERIALS IN THIS SECTION

- Animal Welfare and Animal Rights
- Food Education Is Good
- Presenting Yourself To The Public
- Answering Difficult Questions
- Be An Advocate And Not An Enabler

ACTIVITIES

- Activity #1: Animal Rights or Animal Welfare
- Activity #2: Fact or Myth
- Activity #3: Where Do You Stand?
- Activity #4: Your Own Story
- Activity #5: Activist Encounter Role-Play

SAMPLE MEETING AGENDA – 3 hours

Welcome, Call to Order & Pledge		10 min
Topic Information, Discussion	Animal Welfare and Animal Rights	10 min
Activities Related to Topic	Activity #1: Animal Rights or Animal Welfare	15 min
Topic Information, Discussion	Food Education Is Good	15 min
Activities Related to Topic	Activity #2: Fact or Myth	10 min
Topic Information, Discussion	Presenting Yourself To The Public	20 min
Activities Related to Topic	Activity #3: Where Do You Stand? Activity #4: Your Own Story	50 min
Topic Information, Discussion	Answering Difficult Questions Be An Advocate And Not An Enabler	15 min
Activities Related to Topic	Activity # 5: Activist Encounter Role-Play	20 min
Wrap up, Adjournment & Social Time!		10 min
At Home Activity	Sharing Your Story	5 min

ANIMAL WELFARE AND ANIMAL RIGHTS

As care-takers for animals, it is our responsibility to ensure that they are safe, comfortable, and well cared for. As we know, beef animals are raised for consumption. Whether you are working with a purebred herd that has the intention of marketing animals to other purebred herds, or whether you are working with a market steer that will be harvested for meat at the end of your project, the focus of gaining knowledge about the beef industry does not change. The focus is producing meat-making animals who will provide food. Producing animal product for food is something that producers have every right to take pride in, whether it be meat or dairy product or otherwise. Red meat is a good source of protein and essential nutrients that are a part of a balanced diet. It is important that, as care-takers, we are always aware of the ultimate end goal for our animal(s), whether it be going forward to produce progeny that may be harvested for meat or used for breeding stock, or being harvested itself. No matter what the goal, maintaining respect for the animal and ensuring that it is treated humanely and provided with comfort at each stage of its life, is paramount to having a successful operation. There are strict regulations for farmers about how animals are to be treated. From the beginning of their lives through the practices by which they are harvested, the care of beef animals is monitored, and those who do not adhere to regulations face hefty fines and penalties.

Communicate It!

What are the most important responsibilities of animal caretakers?

Just like any of us, farmers take no joy in seeing animals suffer or be given poor treatment. They are caring and feeling people who, every day, hold the well-being of their animals with more importance than their own. Having a herd that is productive and that is capable of providing a profit, requires having a herd that is healthy, sound, and content. When there is sickness or injury in a herd, the bottom line of the business is affected. Farming is also a labour of love; it is a business that many embrace because it has been in their family for generations and because the individual has a genuine aptitude for caring for animals. It is a job in which there are very few 'days off'. There are long hours, frequent challenges, unpredictable conditions, and back-breaking labour. Several day's rain or drought can affect a crop and, therefore, income for a year or even several years. One animal being bumped by another on the wrong day in the wrong place, can cause abortion of a calf and loss of production from an animal for a whole year. That said, the benefits of being the individual who helps bring new life into the world, or who provides food for their family to enjoy around their Christmas table, is a gift that those who love the industry wouldn't trade for anything.

Research It!

What type of flooring is best for transporting animals? What is the best type of material to put on the floor of the trailer for your animals?

Many individuals across the world are concerned about how animals are treated. Just like farmers, they understand the importance of every animal, be it farm animal or pet, being treated well, and they advocate for the welfare of creatures. These people believe that raising animals for consumption is valid. They understand that it is okay for animals to be harvested, provided that they have lived a comfortable life and been treated humanely. Animal welfarists seek to ensure that animals are well cared for and are free from pain and suffering.

Individuals who agree with animal welfarists, but who also believe that animals should not be used for food, clothing, experimentation, pets, etc. are considered animal rights activists. Dictionary.com defines animal rights as “the rights of animals, claimed on ethical grounds, to the same humane treatment and protection from exploitation and abuse that are accorded to humans.” This means that animal right activists believe that there ought not be any difference between how people live and how other animals live. Many animal right activist groups see the owning of animals as a practice that should be abolished. They endeavour for all animals to be preserved in their natural conditions, in the wild or in reserves. These individuals do not agree with farmers raising livestock, certainly not for food consumption. They also argue against the exhibition of animals, believing that the animals are being exploited, and that they are not properly cared for. Some extremists have gone so far as to plant themselves inside farm facilities as moles, and to take video footage from the farm, often altering it to depict care that is substandard. Animal rights activists often picket and loudly protest at events in which animals are exhibited, including livestock shows, sales, rodeos, etc. These protests are generally loud and invasive, causing undue stress to both humans and animals. These individuals are generally so steadfast in their beliefs that they are not interested in hearing an alternate perspective. They openly target groups like 4-H and Junior Farmers, claiming that these organizations promote the violation of animal rights.

FOOD EDUCATION IS GOOD

Over the last 20 years, the world has become vastly more educated about where its food comes from. Consumers are now interested in knowing where the animals that they consume were raised, and under what conditions. The roadside-stand business is growing exponentially, allowing the public to meet the individuals who have worked tirelessly to provide the food that they consume. Farmers across the world are opening their doors to the public, offering tours of their facilities and greeting guests with open arms. They are bringing consumers and their families into their homes and workplaces to show them first-hand the positive conditions in which their livestock is raised and kept.

While the livestock show industry has always been, in part, about the education of the public with regard to where their food comes from, now it is a major focus. Those farmers who choose to exhibit their livestock are tasked with educating themselves about how to communicate with the public, whether it be those who have genuine questions about the industry, or those who choose to argue against the practices that the farmer uses every day. The fact that Canadians are choosing to go to the source and ask questions of farmers in an effort to improve their knowledge of how animals are raised and harvested, is a very positive thing. Animals rights activists bombard the internet regularly, creating videos and documents that are intended to push the public toward having no trust in the farming industry. They are loud and they are convincing in their arguments, urging consumers to reconsider their beliefs without further education. This has reinforced the importance of the agricultural industry telling the true story of farming.

As a livestock exhibitor, 4-H members are tasked with being a part of a coalition of ag-educators. When families attend livestock show events, they are, for the most part, there to be educated in some way. They want to teach their children what each kind of animal looks like, behaves like, even what their hair feels like to touch. They are eager to see animals who are being treated well, and they often have questions to ask about how they are cared for and what their intended purpose is. The vast majority of these individuals have the best of intentions. It is the job of

exhibitors to speak to these people, welcome them, and answer their questions in the best way they know how. Taking the extra time to introduce your animal safely to a curious child, or to talk with a parent about the corn-fed program that your steer has been part of, may paint the picture of what a 4-H member is all about and allow the public to more effectively evaluate the portraits depicted by nay-sayers. The importance of having people available at your stall to be advocates for the agricultural industry, leaves lasting positive memories in the minds of interested people.

PRESENTING YOURSELF TO THE PUBLIC

When you travel about the country as a livestock show exhibitor, you must be mindful of the fact that people are watching you. Younger exhibitors are looking to see how you handle various challenges as you work with your animal(s). Members of the public are watching to observe how your animal(s) is treated, viewing this as a glimpse into every day life for animals on farms. Knowing that someone is always watching you should not necessarily make you behave any differently; we should always be careful to ensure that we are doing the right thing, but knowing that eyes are glued on your every move, should always be in the back of your mind.

In order to bring forward the best animals that you can, you must always focus on what is best for them. From the moment that a calf takes its first breaths, it relies on its mother and the people who care for it. Animal welfare starts in the barn. Before ever beginning to train your animal, ensure that it has received the proper vaccinations and had any health-related procedures that it requires, and that all practices are handled properly (dehorning, castration, etc.). This will allow your animal to get a good start, which will give them a leg up on defending against any bugs that might crop up over time. Refer to the section on Herd Health in this manual for suggestions regarding vaccination programs and treatment.

When the halter-breaking process begins, remember that your focus should always be on developing a relationship with your animal, and not on using force to make them do as you ask. Animal safety should be in the forefront of your mind. Animals should be monitored and accidents prevented. In the event that an animal is in trouble, caution should always be exercised in handling whatever issue has arisen and in ensuring that it doesn't happen again.

Trailer your animal should always be done with caution. The loading and unloading process should be done carefully, knowing that the footing in a trailer can be less stable than that in natural conditions. Unloading your animal onto wet or muddy ground can be dangerous. Animals should be checked and monitored while on the road at regular intervals, and water should be offered on long trips.

On arrival at a show, exhibitors should be mindful that there are many obstacles that can affect the behaviour of their animal(s). Different sights, sounds, and scents will be new to these animals. This doesn't necessarily mean that they will be afraid of them, or that they should be avoided, it just means that they will need time to take it all in. Be patient with your animals and take things slower than you might at home, especially with your first few shows. Over time, you will come to see that your animal(s) enjoy going to a show. Being clean and dry and having someone scratch your favorite spot is every cow's dream. While these creatures are not pets, they do develop relationships with the animals and people around them that are beneficial to their overall comfort. In the event that your animal does not behave appropriately at a show,

you must be very thoughtful in your response to them. Not only will a negative response make the situation worse and create a lasting impression on your animal, it will also be observed by all those around you. Negative responses appear to other exhibitors as unprofessional, to younger members as permissible, and to the general public as frightening. Your best response to this behaviour is always to remain calm and to give the animal and yourself a break. Tie your animal up safely and ask someone to watch it. Take a walk and a breath. Come back and grab a brush and do some bonding with your animal and then try again. If you are not in a position to calmly handle your animal, hand it over to someone who can. No one is perfect and, as an animal caretaker, you will have imperfect moments. Tempers can flare for both you and your animal, and it is vital that you not let these moments escalate or get the better of your relationship.

When visitors come to your stall or approach you at ring-side to meet your animal and ask some questions, try to make yourself available to them. It is absolutely acceptable to let a visitor know when you are too busy to take a minute, or you are on your way into the ring, but do so in as polite a manner as possible. Responding with, "I'm sorry, but I really can't visit with you right now, because I am getting ready for my class, but if you come back in 30 minutes, I will be happy to answer your questions", or passing them along to someone who is more available at the time than you are is 100% appropriate. Remember that your politeness in these interactions will be remembered.

It is very common for members of the public to want to touch any animal. This is understandable, as their fluffy and soft hair is very inviting to passers-by. Be available to visitors to assist them in touching an animal where possible. Monitor the behaviour of your animal(s) to make sure that they are safe for handling at any given moment. In the event that your animal is not eager to be handled, suggest that they visit with another exhibitor to do so. Encourage visitors to ask the exhibitors for permission to touch their animal, and thank them when they do so, rather than going ahead and creating a safety risk.

In the event that you are suspicious that an individual has approached you with undesirable intentions and that they might be a representative of an animal rights activism group, remain calm and be extra mindful of your actions and words.

It is always possible that visitors considered to be anti-animal farming (or activists) are attending an event.

Here are some things to consider:

- Be aware of visitors that hang back or wander off to areas not meant for the public. Do not be nervous about approaching visitors. You can politely encourage them to keep up with the group or re-direct them if they have wandered off.
- Always approach visitors in a non-controversial manner.
- Suspicious visitors should be reported to leaders so that they can continue to monitor the individual and report them to security if needed.
- If you notice that there are people, perhaps off to the side, who are observing or taking photos, make a mental/written note of the time and situation including any details such as physical appearance and clothing. Pass this information on to your leader.

- If someone engages in sensitive questioning, consider whether or not the question deserves an answer. Don't feel like you have to answer them. Offer to take their question and contact information, and get back to them at a later date or direct them to someone who might be able to answer the question.

ANSWERING DIFFICULT QUESTIONS

When it comes to answering questions that visitors to your stall might ask you, don't feel like you need to be a walking encyclopedia of bovine information. Be honest in answering questions that you know the answers to. When you are not sure how to answer someone, it is okay to say that you are not sure, and to direct them to someone who might be able to better answer them. Keep in mind, that you are a representative of your club, the herd that your animal comes from, and the agricultural industry. Take this responsibility seriously and talk with others regularly about how to best handle questions as you are out and about. Only 2% of Canadians are farmers, and those who don't farm are curious about what farming is all about.

The Do's Of Answering Difficult Questions

When talking with members of the public at an event,

Do...

- Try to make yourself available for greeting guests and answering questions. Be yourself and show that you care.
- Be honest in your answers to people. Use facts and do not generalize. Speak about your own experiences as much as possible.
- Ask for help from someone with more experience or knowledge as needed.
- Use "I don't know" as an acceptable response. Offer to take the visitors' contact information and get back to them or refer them to someone else who might know the answer as needed. Offer to write down their question and get back to them with an answer.
- Hear the person out. Sometimes the person asking the questions or making comments might just want to rant and be heard, and they don't actually even have a question. Be patient and allow them to say their piece. Interrupt politely if they continue for more than a minute or two. Thank them for their opinions/questions and ask if they have an actual question that they would like you to address.
- Agree to disagree if needed. It is nearly impossible to change the mind of those who have strong opinions or agendas. Respond with "I am sorry that you feel that way, this is how we practice food animal care on my farm, and we are going to have to agree to disagree on this".
- Invite discussions. Avoid getting into debates and confrontations with visitors. If you encounter a visitor that wants to have a debate, look to your leader for support in shutting the conversation down.
- Always maintain positivity. Remember that a huge part of your message will be delivered in how you say it and not in what you say.

- In the event that a conversation escalates, always keep your cool and remember that the individual you are speaking to may be trying to stir up an angry response from you. Be professional and calm and walk away if you need to.
- Be mindful of the fact that controversial visitors may have recording devices, such as cell phones with them. Do not allow for negative media opportunities.
- Walk away when you need to.
- Call on leaders and security at the event as needed

Credit: Tips for 4-Hers & Youth Exhibitors at the Royal Agricultural Winter Fair 2015 by Farm and Food Care

In every interaction, ask yourself whether the person that you are talking to agrees with your ethical right to produce/be involved with producing food. If the answer to that question is yes, engage in the conversation; if it is no, choose not to engage.

BE AN ADVOCATE, NOT AN ENABLER

When we are confronted with an act of activism at an event, often times we take the situation very personally. To be critical of food-producers who act in agreeance with animal welfare codes of ethics, and who take the care and well-being of their animals very seriously, is a difficult thing for agriculture enthusiasts to understand and stomach. When these situations arise, it is important that we remember that these individuals represent only a small portion of the opinions of Canadians. Activists may engage in conversation with you with a goal of gaining information to be used against the industry, and may go so far as to perform a demonstration in opposition to your activities.

If a controversial conversation or a demonstration should arise remember...

- Not to engage with those whose minds you cannot change.
- To bow out of situations and solicit help from a leader or security as needed.
- To watch for picture taking and videography and politely ask that your animal not be filmed.
- If a demonstration should arise, do not respond with aggression or agitation. Protestors deliberately attempt to aggravate those who they are protesting against. Responding by tearing signs down, shouting, etc. will only make the situation escalate. Somewhere, someone in the crowd does have a video camera and is ready to take footage of anyone who is being aggressive toward the demonstrators. They will then use this footage to their advantage in misrepresenting the situation.

Not to view video footage found online that was created by an activist group. The more hits these pieces get on social media channels, the more the group succeeds in publicising their message.

Do It!

In small groups, create a list of difficult questions members of the public might ask about agriculture. Then, take turns coming up with answers for each of these questions.

As an exhibitor at a show, ensure that you take the steps necessary to be an advocate for agriculture and that you refrain from enabling extreme activist behaviour.

Discuss It!

Did you know that the more views a video gets on YouTube, the higher it ranks in search results. Whether you are viewing a video because you identify with its message or whether you are viewing it because you don't, you are aiding in its promotion.

Do you watch YouTube videos? Have you seen videos created by activists?

Discuss how you might feel if you were not familiar with farming and one of these videos was your first impression of how animals are treated. How would you feel about the industry?

ACTIVITY # 1
ANIMAL RIGHTS OR ANIMAL WELFARE?

DO	<p>Time: 15 minutes</p> <p>Materials:</p> <ul style="list-style-type: none"> - Animal Rights or Animal Welfare Worksheet - Pens <p>Instructions:</p> <ul style="list-style-type: none"> - Have each member decide whether each statement is an Animal Rights statement or an Animal Welfare Statement independently. Watch for members who may need to pair up with an older member. - As a group, take up the answers one by one, asking firstly that the group say which answer they had and then discussing the answer and letting them know whether they were correct.
REFLECT	<p>Learning Outcomes:</p> <p>Have members understand the difference between Animal Rights and Animal Welfare.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Have you heard these statements before? If so, which have you heard? Who made those statements and were they right or wrong? - Did you learn anything you didn't know from one of these statements? - Were you surprised by any of the answers in this activity?

ANIMAL RIGHTS OR ANIMAL WELFARE WORKSHEET

Decide whether each statement is one that might be made by someone who is promoting Animal Rights or someone who is promoting Animal Welfare.

	Animal Rights	Animal Welfare
1. Animals should be given clean water to drink.		
2. Milk production is bad for cows.		
3. Animals should not be in barns.		
4. Making clothing from animals is wrong.		
5. Calves should be weaned slowly, with minimal distress.		
6. Calving pens should be kept clean.		
7. Cattle should be fed a balanced diet		
8. Cattle should be able to roam freely, without human impact.		
9. Killing animals for meat is cruel.		
10. There should be strict regulations in place for using animals for food.		
11. Animals in distress should be treated immediately.		
12. Animals should be provided with shelter, food, and water.		
13. Animals should not be kept as pets.		
14. Cattle will be most happy if they are left alone.		
15. Safety of the animal should always come first when caring for them.		

ANIMAL RIGHTS OR ANIMAL WELFARE WORKSHEET

ANSWER KEY

Take up the answers and discuss the rationale behind each answer.

	Animal Rights	Animal Welfare
1. Animals should be given clean water to drink.		✓
2. Milk production is bad for cows.	✓	
3. Animals should not be in barns.	✓	
4. Making clothing from animals is wrong.	✓	
5. Calves should be weaned slowly, with minimal distress.		✓
6. Calving pens should be kept clean.		✓
7. Cattle should be fed a balanced diet		✓
8. Cattle should be able to roam freely, without human impact.	✓	
9. Killing animals for meat is cruel.	✓	
10. There should be strict regulations in place for using animals for food.		✓
11. Animals in distress should be treated immediately.		✓
12. Animals should be provided with shelter, food, and water.		✓
13. Animals should not be kept as pets.	✓	
14. Cattle will be most happy if they are left alone.	✓	
15. Safety of the animal should always come first when caring for them.		✓

**ACTIVITY # 2
FACT OR MYTH**

<p style="text-align: center; font-size: 2em; color: white;">DO</p>	<p>Time: 10 minutes</p> <p>Materials:</p> <ul style="list-style-type: none"> - Fact or Myth Statement Sheet <p>Instructions:</p> <ul style="list-style-type: none"> - Ask all of your members to stand and remove any obstacles that might be in the room. - Declare one side of the room to be the ‘fact’ side. - Declare one side of the room to be the ‘myth’ side. - Have one person read each fact or myth aloud (a leader or senior member). - Ask members to go to the side of the room that they think applies to the statement. Give them 20 seconds to make up their minds. - Have the reader let the group know whether the statement is a myth or a fact and have brief discussion about each. - Carry on with each statement on the list in the same manner.
<p style="text-align: center; font-size: 2em; color: white;">REFLECT</p>	<p>Learning Outcomes:</p> <p>To have members gain an understanding of whether some of the popular myths and facts that they hear surrounding beef production are true or not and to encourage members to think independently, without being influenced by others.</p>
<p style="text-align: center; font-size: 2em; color: white;">APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Which statements were you surprised by? - What did you learn from this activity? - Did anyone else’s answers influence yours? Why? - How does it feel to make a decision and stand by it, even if someone you know and respect disagrees with you?

FACT OR MYTH STATEMENT SHEET

<input type="checkbox"/> COWS CAUSE GLOBAL WARMING.	MYTH
Rationale: Beef and cattle production have been targeted as a major producer of greenhouse gas emissions. In reality, livestock or cattle contribute as little as 18 percent of greenhouse gas emissions.	
<input type="checkbox"/> RAISING CATTLE REQUIRES WATER SUPPLY MANAGEMENT.	FACT
Rationale: Water management and raising cattle go hand in hand. It takes more than 2,400 gallons of water to produce just one pound of meat.	
<input type="checkbox"/> GRASS-FED BEEF IS BETTER THAN GRAIN-FED BEEF.	MYTH
Rationale: Nutritionally, there are many differences between grain-fed and grass-fed beef, but neither is necessarily any better or worse than the other. Which is best is a matter of taste only.	
<input type="checkbox"/> MEATLESS MONDAYS ARE A SMART PRACTICE FOR ME AND FOR THE ENVIRONMENT.	MYTH
Rationale: While variety in a diet is always a good idea, steering away from eating meat for one day each week will not make a significant change in the health of humans or in the environment.	
<input type="checkbox"/> FACTORY FARMING HAS TAKEN OVER THE BEEF INDUSTRY.	MYTH
Rationale: Many family farms still exist and are thriving. In fact, the average herd size for beef cattle in Canada is currently 69 and 39% of Canadian beef farms have less than 47 head of cattle.	
<input type="checkbox"/> BEEF FARMERS USE ANTIBIOTICS WITHOUT REGARD FOR ANIMAL WELFARE OR HUMAN HEALTH.	MYTH
Rationale: Many beef animals do get treated with antibiotics throughout their lifetimes. Stipulations for when and how animals are treated with antibiotics before they are used for human consumption are highly regulated, and farmers face hefty penalties if they should disregard these regulations. Traces of antibiotics in beef found in Canada are miniscule and non-threatening to humans.	
<input type="checkbox"/> THERE ARE HORMONES IN BEEF.	FACT
Rationale: All meat contains hormones, whether the animal is given growth hormone implants or not. The hormone levels in beef are minimal and, in fact, the average bun that a hamburger is served on contains more hormones than the beef patty does.	
<input type="checkbox"/> FACTORY FARMS FORCE FEED CATTLE UNNATURAL CORN DIETS.	MYTH
Rationale: Cattle cannot be force-fed and will not digest more food than they can naturally handle.	

<input type="checkbox"/> UNDERCOVER VIDEOS SHOW ABUSE AND ARE REPRESENTATIVE OF THE ENTIRE BEEF INDUSTRY.	MYTH
<p>Rationale: Undercover videos created by animal rights activism groups have been very prevalent in recent years. Activists will plant themselves inside herd operations as staff members for months at a time, waiting for any chance they might get to find animals in situations that appear to be less than ideal, often times falsifying the coverage to make it appear less humane than it is. Any mistreatment of animals is not only seldom seen, but is taken very seriously and faces harsh penalty.</p>	
<input type="checkbox"/> THERE ARE GMOS IN CATTLE FEED.	FACT
<p>Rationale: Genetically Modified Organisms do exist in many cattle feed products. That said, scientific research proves that these GMOs are of no threat to humans who consume beef from animals who have been fed GMO plants.</p>	
<input type="checkbox"/> BEEF IS SAFE TO EAT.	FACT
<p>Rationale: Guidelines for the raising, feeding, and processing of Canadian beef make it a safe and healthy source of protein and essential nutrients for a balanced diet.</p>	

Credit: <http://www.oklabeef.org/beefproductionmythsandfacts.aspx>

ACTIVITY # 3
WHERE DO YOU STAND?

DO	<p>Time: 30 minutes</p> <p>Materials:</p> <ul style="list-style-type: none"> - Where Do You Stand Worksheet - Pens <p>Instructions:</p> <ul style="list-style-type: none"> - As a group, read through the statements one by one and have members give some thought to their responses before making them. - Have some discussion surrounding each question and possible answers, asking members to share their opinions as they feel comfortable. Encourage open dialogue and members sharing their true feelings without judgement. Discuss the fact that not every person who believes in some level of animal rights is an activist and that there are different types of activists. Take your time in discussions to ensure that members are feeling heard.
REFLECT	<p>Learning Outcomes:</p> <p>To allow members a chance to form their own opinions about how they feel about animal welfare and animal rights issues and to encourage members to respect the opinions of others, even when they disagree with them.</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Where there any statements that were difficult to form an answer to? - Through discussion, where there any statements that you changed your mind about? - Why is it important to learn to respectfully disagree? - How can you practice respectful disagreement?

SA A U D SD

I 1.IT'S WRONG TO SHEAR A SHEEP.

SA A U D SD

I 2.I WOULD KILL A BEAR OR COYOTE RATHER THAN ALLOW IT INTO MY HERD.

SA A U D SD

I 3.FARMERS TREAT THEIR PETS DIFFERENTLY FROM FOOD ANIMALS.

SA A U D SD

I 4.BY ACTUALLY TOUCHING AND FEELING, I CAN LEARN MORE ABOUT AN ANIMAL THAN BY WATCHING A VIDEO OR COMPUTER.

SA A U D SD

I 5.I WOULD KILL A RABID SKUNK OR A COYOTE WITH MANGE.

SA A U D SD

I 6.THE WAY I HANDLE MY ANIMALS CAN AFFECT THEIR BEHAVIOUR AND MAKE THEM MORE OR LESS TAME.

SA A U D SD

I 7.SOME ANIMALS ARE NATURALLY MORE WILD AND DIFFICULT TO HANDLE THAN OTHERS.

SA A U D SD

Credit: 4-H Alberta Bison Project

ACTIVITY # 4
YOUR OWN STORY

DO	<p>Time: 20 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- Your Own Story Worksheet- Pens <p>Instructions:</p> <ul style="list-style-type: none">- Have members complete the Your Own Story worksheet.- Have members share their stories within the club meeting as they feel comfortable, encouraging them to share their story with others where appropriate.
REFLECT	<p>Learning Outcomes:</p> <p>To allow members to develop their own story about their interest in or work with the beef industry. These stories can then be shared with others in an effort to promote the beef industry positively</p>
APPLY	<p>Processing Prompts:</p> <ul style="list-style-type: none">- What is something new that you learned about one of your fellow members in this activity?- Was it difficult or easy to write your own story?- How would it feel to share your story with others?

YOUR OWN STORY WORKSHEET

This year, I chose to be a member in a beef club because...

As a 4-H member in a beef project, 3 really positive things that I have learned about the beef industry so far this year are:

- 1.

- 2.

- 3.

Now, use these positive pieces of information about the industry and your experience to share one positive story about working in the beef industry and that tells the truth about the industry as you see it.

ACTIVITY # 5
ACTIVIST ENCOUNTER ROLE PLAY

<p>DO</p>	<p>Time: 20 minutes</p> <p>Materials:</p> <ul style="list-style-type: none"> - Script for skit for role play activity - 6 volunteer member 'actors' to play out the skit <p>Instructions:</p> <ul style="list-style-type: none"> - Have 6 members read through the skit independently and then do one 'rehearsal' of it before coming back to perform it for the group. Members can get as creative as they like with how it is presented, or can simply read through it for the members, but encourage them to stick to the script. - Make use of Processing Prompts for discussion.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To have members gain confidence in responding to opposition and negative situations and to have members gain skills in critical thinking.</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> - Which person that Sally encountered handled the situation appropriately? - Why was this person's response the best one? - Which response was the least effective? Why? - What made each person's response to Sally good or bad? - Is this a realistic situation that could happen in real life? - What would/should you do if you encounter someone like Sally?

ACTIVIST ENCOUNTER SKIT

In this skit, one member will play the role of an animal rights activist. This member will encounter 4 different individuals who are exhibiting cattle at a show throughout their time in the barn.

Narrator: To set the scene, it is show day at a major event for our 4-H club. Our cattle have been washed and dried and are lying happily in their beds as we await show time. Many exhibitors throughout the barn are visiting with one another and enjoying fellowship before the business of the show begins. Some are chatting around their show boxes, others are clipping away at their animals, but all are visiting with passers-by as they tour the barns.

One visitor, Sally, has just entered the grounds and has quietly made her way to the barn. She has recently joined an animal rights activism group called Animals Are People Too, and she sincerely believes that the practice of exhibiting cattle should be abolished. Furthermore, she disagrees with the raising of cattle for food and thinks that cattle who are currently on farms should be released to the wild. She has come to the show to impress her views upon the public and the exhibitors who are there, along with some friends.

We join the story as Sally comes to speak with an exhibitor, Ronnie, who is currently working with his animal in a clipping chute.

Encounter #1 (Sally and Ronnie, the Clipper)

Sally: Excuse me sir, but I see that you have this innocent animal contained on a rope that is squeezing its face and that you are forcing it to stand in this containment system and be toyed with for your own enjoyment. Did you know that this animal is secretly crying on the inside, wishing that it could run free and be left alone instead of fearing for its life every day and....(she continues until interrupted)

Ronnie: (Interrupting Sally, loudly and irately)...Listen lady, I have a lot to do today and I am tired of hearing what you have to say already. I don't care what you think and neither do any of the farmers here. These animals have a job to do. Do us all a favour and leave.

Narrator: Sally is overjoyed to see that she has annoyed Ronnie and takes this encounter as a victory. She even got some good audio coverage of the encounter on her phone, which she had in her pocket during the whole conversation. It will be easily manipulated and edited for some great social media highlights from this event.

Sally moves on from this conversation to find Elaine alone at her stall area.

Sally: Good morning, miss. I hope you're enjoying some relaxation on this fine morning and taking pride in the fact that you are crushing the soul of the defenceless animals that sit in front of you. Poor things, tied up and bound...waiting to be humiliated on display as crowds cheer and you parade them around in circles.

Elaine: Good morning to you too. I gather that you have some negative feelings about cattle being shown. Please understand, these animals are my very best friends. I hug them and

love them and we even go on picnics together. Your opinions about the show industry really couldn't be further off base. Just look at how happy they are.

Sally: Your best friends, eh? That's an awfully strange way to treat your best friend. I bet you even think it's okay for your 'friends' to be killed for meat. (Sally carries on until interrupted by the narrator).

Narrator: (interrupting Sally) Once Sally tires from conversation with Elaine, she moves on to speak with Bo, who is currently brushing his animal.

Bo: Good morning, miss.

Sally: Good morning to you too. My name is Sally and I am from Animals Are People Too. We're here today to bring justice to these poor defenseless animals who have been caught by ropes and transported in crates and then forced to be handled by passers-by and put on display for their enjoyment.

Bo: (Interrupting Sally calmly) Miss, I believe you and I have opposing views and that we are going to have to agree to disagree today. You've said your piece and I will ask now that you move along and allow me to get back to caring for my animal.

Narrator: As Bo moves back to working with his animal, Sally does press on and he asks a friend to reach out to security for help in escorting Sally away from the area. As Sally is being walked toward the gate, She runs into Shelley, who is also an exhibitor at the show.

Shelley: (Loudly and Irately) That's right, security, get this no good, rotten woman out of here. There is no place for people like her in a show barn.

Sally: See? These people don't even care about other people! They have no feeling! Save the cows!

Shelley: Save us all some time and leave!

Narrator: As this altercation breaks out between Shelley and Sally, more people start to gather and members of the public begin to be distracted by it.

AT HOME ACTIVITY

Take a chance to share your story about your involvement in the agricultural industry with those around you. Educate someone who doesn't have a tremendous amount of knowledge about beef cattle about something that you feel comfortable sharing your knowledge about. For example, tell a friend about your involvement in the 4-H program or discuss your work with beef cattle in the herd that you work in with your class at school or visit a 4-H booth at a farm show as a representative and talk to the public about the 4-H program.

DIGGING DEEPER 1 FOR SENIOR MEMBERS A Day in the Life of a 4-H'er

As a member in a beef 4-H club, there are lots of skills that you have gained and things that you have learned. Whether you grew up on a farm, have recently become involved with one through 4-H, or you are working on this project for interest's sake and doing a written project, you have developed some interest in the industry and have taken the time to learn more about it. Now it's time to share your experience with the world.

Senior Member Activity:

We know that we live in a wireless world, where social media and the internet in general play a major role in public education. There has been a strong initiative in the last few years for broadcasting positive messages about farming through social media. Take a look online for the #Farm365 project and also at the Dinner Starts Here video blogs. See if you can find some additional sources as well.

If you're comfortable, work with some other senior members in your club to develop your own positive ag-education social media gimmick. Develop a hashtag or make your own video blog. Be sure to focus on some of the positive things that happen on farms and not develop an opinion piece. Keep it light and fun.

Note: Please practice safe social media habits, and be sure to ask for help in doing so if you need it.

DIGGING DEEPER 2 FOR SENIOR MEMBERS The Facts Behind Antibiotics and Hormones in Beef

One of the very hot topics currently in media surrounding beef is the dilemma regarding whether hormones and antibiotics in beef are safe.

Senior Member Activity:

Do some research surrounding antibiotic-free and hormone-free beef and beef that is raised with the use of hormones and antibiotics. Check out some online coverage of the issue and do an interview with a beef farmer who raises his or her animals with the use of hormones and antibiotics and one who does not. Get a look at the difference in cost to the farmer between these two types of programs, and make some decisions about which way you would choose to go with your own herd of beef cattle, if the decision was solely yours.

SECTION 7E: BEEF JUDGING

SETTING OBJECTIVES

In order to best understand the inner workings of the show industry, the exhibitor must learn how to think like a judge. In this meeting, members will get valuable practice with judging beef animals and will be encouraged to evaluate classes in an effort to gain further understanding of the industry.

Suggested Lesson Outcomes

- To illustrate what an ideal beef animal looks like.
- To coach members with regard to how to judge beef cattle.
- To teach members the importance of judging their own herd for sale selection and breeding program decisions.

REFERENCE MATERIALS IN THIS SECTION

- What Is Judging?
- Why Do We Judge?
- Beef Judging How To's
- Giving Reasons
- Judging In Your Herd

SUGGESTED MEETING RESOURCE

- 4-H Ontario Judging Project

ACTIVITIES

- Activity #1: Let's Make A Score Card
- Activity #2: Team Judging A Class of 4
- Activity #3: Compare and Contrast
- Activity #4: Designing The 'Perfect' Animal

SAMPLE MEETING AGENDA – 4 hours, 40mins

Welcome, Call to Order & Pledge		10 min
Topic Information, Discussion	What Is Judging? Why Do We Judge? Beef Judging How To's	45 min
Activities Related to Topic	Activity # 1: Let's Make A Score Card Activity #2: Compare and Contrast	35 min
Topic Information, Discussion	Giving Reasons	15 min
Activities Related to Topic	Activity #3: Team Judging A Class of 4	15 min
Topic Information, Discussion	Judging In Your Herd	10 min
Activities Related to Topic	Activity #4: Designing The 'Perfect' Animal	20 min
Wrap up, Adjournment & Social Time!		10 min
At Home Activity	Evaluate your own animal	5 min

WHAT IS JUDGING?

Judging is the process of making a decision through thinking critically. It involves using a set of criteria to form an opinion on something and having reasons to support that opinion. In 4-H, a variety of items are commonly judged, to help members learn about a wide variety of articles and their desirable/undesirable characteristics. More importantly, judging in 4-H helps members learn many skills that are useful in 'everyday life.'

The process of judging involves first learning how to think critically; this means assessing the subject that we are looking at for its positive and less desirable qualities and making a decision based on that assessment, followed by providing reasoning for that judgement.

Thinking critically is a process accomplished through several steps.

1. Analysis: breaking something into parts to better understand the parts and the whole (identifying, classifying, categorizing, comparing)
2. Synthesis: making connections between the parts and the whole to see the pattern of relationships (organizing, connecting, designing, predicting)
3. Interpretation: examining the connection(s) between the parts and the whole to make decisions about the implications and meanings of the pattern(s) (associating, inferring, decoding)
4. Evaluation: forming judgments about meanings, qualities and values (justifying, critiquing, verifying, deciding)

When we judge, these steps are followed, no matter the subject matter we are looking at.

WHY DO WE JUDGE?

Judging is very important because of the transferrable skills it teaches you. It is important to remember that judging is not just a 4-H activity. Even if you do not become an official judge for something in the future, you will use this process long after your 4-H career and it can be applied to any class, from livestock, to clothing, to photography, as well as later in life from shopping, to selecting a herd sire, to choosing a job, career or apartment.

Judging is a matter of opinion. It is not a matter of 'right' or 'wrong.' Do not be discouraged if you do not agree with a judge. Focus on having logical, informed reasons for your decisions instead.

Learning how to judge beef cattle not only lets us take accurate looks at our show herds, so as to have realistic expectations for our results, but it also allows us to evaluate our animals for the advancement of our future goals in any given herd.

Why do we judge in 4-H?

- To gain confidence.
- To gain a sense of accomplishment.

- To learn how to make a choice.
- To improve memory.
- To learn to assess the positives and negatives of a situation.
- To gain the ability to make sound decisions that you can stand behind by having the ability to give good reasons for making those decisions.
- To learn how to organize your thoughts and to think while you're talking.
- To help you communicate your ideas clearly so others can understand.
- To learn to choose articles based on their quality, instead of being influenced by information someone tells you.
- Because you judge every day of your life (at the grocery store, selecting a herd sire, clothes you wear, what you will have for breakfast, your hair style, what jeans to buy).
- To assist you in making networking connections with professionals involved in your area of interest. (Beef, Dairy, Sewing, Baking, Horticulture, Flowers, Crafts, etc.)

BEEF JUDGING HOW-TO'S

The aim of the beef industry is to efficiently produce carcasses of the type and quality demanded by the consumer. The ability to look at the live beef animal and evaluate its potential to produce these carcasses, is a challenge to you and to others in the beef industry. We use live animal appraisal techniques in the show ring, the feedlot, the pasture and at the auction sale to assess the quality of our beef animals. This is what we refer to as judging beef – the art of visually comparing and ranking beef cattle.

Steps to Judging

There are five basic steps to judging a class, regardless of whether it is market hogs, candler, flower arrangements or potatoes. In order to be a successful judge, use the steps below to compare the articles in each class. You will use the process long after your 4-H career.

- 1.** Come prepared – Know what the ideal sample for the class looks like.
- 2.** Stand back and take a look – Evaluate the class from a distance.
- 3.** Move in for a closer look and make individual sample notes – Go to each sample (animal) and examine them more carefully.
- 4.** Decide on final placing and prepare reasons – Step back for one last look at the class and make selections for placings.
- 5.** Give your reasons – Comment on each sample (animal), letting them know why you chose to place them where you did.

SO WHAT DOES THE IDEAL BEEF ANIMAL LOOK LIKE?

In Section 1 of this manual, we looked at the anatomy of the beef animal.

Here is a brief review...

The Parts of the Beef Animal



A. Tail head	H. Muzzle	O. Knee	V. Pastern
B. Hip	I. Throat	P. Cannon bone	W. Dew claw
C. Rump	J. Dewlap	Q. Hoof	X. Hock
D. Loin	K. Point of shoulder	R. Elbow	Y. Switch
E. Back	L. Shoulder	S. Navel or sheath	Z. Round
F. Crest	M. Brisket	T. Rear flank	AA. Pin
G. Poll	N. Forearm	U. Stifle joint	BB. Rib

Credit: <http://www.cals.uidaho.edu/edcomm/pdf/pnw/pnw669.pdf>

Terms Associated With The Beef Animal



- | | | | |
|----|----------------------------|----|--------------------------------------|
| A. | Top or topline | G. | Deeper bodied; deeper middled |
| B. | Hooks to pins; level hiped | H. | Heart girth |
| C. | Depth of flank | I. | Spring of rib; rib cage |
| D. | Hip height; framed | J. | Long fronted; thin necked |
| E. | Cod/Udder region | K. | Width of chest floor; wider tracking |
| F. | Length of body | | |

Credit: <http://www.cals.uidaho.edu/edcomm/pdf/pnw/pnw669.pdf>

BEEF TERMINOLOGY

One of the most confusing things about judging is the terms we use to describe the animals. It may be hard to define some of these terms because they have different meanings to different people. Let's have a look at some of the more common terms and their definitions.

Market Steer Terminology

Muscle	<ul style="list-style-type: none"> - Red meat or lean. - That part of the carcass which is not bone or fat.
Carcass	<ul style="list-style-type: none"> - The part of the animal which remains after the removal of the head, feet, hide and internal organs. - The carcass is composed of bone, muscle, fat and connective tissue.
Finish	<ul style="list-style-type: none"> - The amount of fat covering on a market animal - Overfinished – The animal has too much fat cover. - Underfinished –The animal doesn't have enough fat cover to fall into a desired grade.
Cutability	<ul style="list-style-type: none"> - The saleable meat in proportion to the total carcass. - A high cutability, or high proportion of red meat to bone and fat, is desirable.
Frame	<ul style="list-style-type: none"> - Skeleton size. - This can be determined by looking at bone length and width and is easy to see in areas where there is nothing but bone, such as the cannon bone.
Structure	<ul style="list-style-type: none"> - Must be sound or free from any defects, which inhibit performance. - Must be correct and show the desired structural traits.
Balance	<ul style="list-style-type: none"> - The overall view of the animal, including how well the parts blend into one another and how freely and smoothly the animal moves.
Trimness	<ul style="list-style-type: none"> - Freedom from excess fat or finish. - This can be determined by looking at places where fat tends to accumulate – the brisket, flank and twist.
Grade	<ul style="list-style-type: none"> - The description a carcass receives based on the maturity of the carcass, the quality (color, texture, and firmness of the muscle, marbling and fat) and the meat yield.
Style	<ul style="list-style-type: none"> - Way of going, alertness, gait, coloring - this is often referred to as eye appeal.
Meatiness	<ul style="list-style-type: none"> - The degree of muscling. - A meaty animal will have superior muscling.

Breeding Animal Terminology

The terms used for breeding stock are similar to those used for market animals. Soundness, correctness and breed character are most important in conformation of beef breeding stock. There are several terms, which relate to these qualities.

Conformation	<ul style="list-style-type: none">– The overall structure of the animal.– Includes all the points mentioned.
Masculinity	<ul style="list-style-type: none">– This term is used to describe bulls.– Massiveness and strength of the animal.– Secondary sex characteristics such as well-developed and defined muscles, thickness throughout the shoulder, neck and crest regions, overall well developed forequarters and a well-developed scrotum.
Femininity	<ul style="list-style-type: none">– This term is used to describe heifers and cows.– Refinement of the head, neck and shoulders, the degree of muscling.– Evidence of udder and teat development.– Females should have smoother muscling than bulls and should be more refined through the head, neck, and shoulder.
Breed Character	<ul style="list-style-type: none">– The shape of head, length of body, height, color markings and other characteristics as defined by the Breed Associations as characteristic of that breed.
Condition	<ul style="list-style-type: none">– This means the same thing as finish does for the market animal. It is the amount of fat and muscle that the animal is carrying.
Broodiness	<ul style="list-style-type: none">– Indicators that a female will be or is a good mother.– Includes adequate size and frame to carry a calf, udder and teat development and disposition.
Capacity	<ul style="list-style-type: none">– Also means volume or depth.– The size and frame of an animal in relation to its ability to carry a calf, develop desirable muscling, and remain structurally sound over the years.
Progeny	<ul style="list-style-type: none">– The offspring or calves of a female or bull.

Carcass Terminology

In addition to the terms already defined, there are many other terms you will encounter when working with carcasses. Because, in the beef industry, our product is meat, we need to understand the importance of these characteristics whether we are judging live animals or carcasses.

Connective Tissue	<ul style="list-style-type: none">– Includes tendons, ligaments and cartilage.– These all help to hold the body and organs together.
Gristle	<ul style="list-style-type: none">– Refers to the heavy deposits of connective tissue found in the muscle.– Meat with lots of connective tissue will be tough to cut and chew.– Connective tissue looks like white or colorless ribbons and threads through the meat.
Cartilage	<ul style="list-style-type: none">– Connective tissue which may be replaced by bone as the animal matures and develops.– In the mature animal, cartilage is only found in places where there needs to be elasticity and flex such as the ears and the joints.
Maturity	<ul style="list-style-type: none">– The age of the animal or carcass.– Affects the eating quality of the meat.– Is determined by the degree of bone ossification or hardening of cartilage into bone.
Marbling	<ul style="list-style-type: none">– Amount, size and distribution of fat within the meat.– This does not include the outside covering found on many cuts nor any large fat deposits within the muscle.– Looks like little white flecks in the meat.– Marbling gives the meat flavor and tenderness.
Fat Level	<ul style="list-style-type: none">– Means the fat measurement at the minimum point of thickness in the fourth quadrant of the longissimus muscle between the 12th and 13th ribs.

Credit: <https://www.gov.mb.ca/agriculture/rural-communities/4h/pubs/judge-beef-factsheet.pdf>

SCORING BEEF ANIMALS

In every class that can be judged, there is a common scorecard that is used to rate the importance of different characteristics in the class.

In the beef industry, unlike the dairy industry, there is no model by which all beef cattle are judged. Different breeds of beef cattle are evaluated slightly differently, and this makes evaluating beef cattle a matter of opinion in many cases. There are also different standards by which breeding animals and market animals are evaluated. That said, there are some overall rules of thumb to go by in terms of what elements of the beef animal are important to focus on.

When judging beef cattle, there are five main areas to concentrate on, whether you are looking at breeding animals or market animals.

1. Growth and frame or skeletal size
2. Muscling
3. Volume/performance
4. Condition/Trimness
5. Structure, Soundness and Balance

Judging Growth and Frame or Skeletal Size

In section 5 of this manual, we learned about frame score and finishing weights. When we begin to evaluate animals, one of the first elements we will want to look at is whether or not they are growing at an ideal rate and developing an ideal frame score for our purposes. Animals that have too small a frame are less desirable for processing because they cost the industry more dollars per pound to process and in breeding, they can be more prone to calving problems if they are not bred carefully. If an animal has too large a frame, they are less desirable from a market standpoint because they are too large for processing facilities and their cuts are too large for consumers. Furthermore, there is more investment in a larger framed animal to bring it to an ideal finish because they cost more dollars to feed. Indicators of size in beef animals include their length of body, height at the hip, and length and size of cannon bone. The ideal beef animal, no matter what its intended use, is of moderate frame, proving a low investment in feed dollars per pound growth in the animal.

Judging Muscling

Muscling in beef animals is what produces red meat. The ideal animal will have a higher volume of muscle than fat, as consumers prefer meat that is low in fat. Muscling can be observed in the round, the width of stance, and the width of top. To observe an animal's level of muscling and evaluate whether what you are seeing is muscling and not fat, look for movement and bounce throughout the animal's body as it walks; muscle moves and bounces, fat appears more solid. There are 5 key areas where you should check for the amounts of fat and muscle. These are the brisket, flank, twist, rump, and forearm. The brisket is located underneath the breastbone, which has very little muscle over it. Therefore, if the brisket is deep and full with fat deposits, there will be deposits of waste fat in other areas of the carcass. Similar deposits can be found through the flank and twist of an overfat animal. Examination of the forearm provides an

indication of how well-muscled the animal is all over. Fat does not accumulate on the forearm because it is composed entirely of muscle and bone. If the forearm is bulging and muscular, the animal will have well developed muscles all over its body because muscle develops evenly. A desirable animal has a thick hind end. The muscles covering the rear should be curved and rounded rather than flat because muscles are not square and rectangular. Thickness is desirable low in the stifle area. The animal should be thicker through the stifle area than anywhere else. Very little fat is ever laid down on the outside of the stifle region. If the animal is thick here, it can be assumed that it is exhibiting good muscling. Much can be observed about the amount of muscling on an animal by looking at it directly from behind. An ideal animal with good muscling will stand wide on its hind legs because the hind legs are attached high in the hip area and adequate meat product in this area will force hind legs to be pushed apart. The hind end contains the high-priced cuts. An animal with a wide leg stance, indicating superior muscling in this area, will yield lots of red meat from the hind end.

Judging Volume and Performance

Volume and capacity indicate performance in beef animals, as animals with greater depth of body and spring of rib will be able to ingest more feed and convert it to growth faster than those without. The length, depth, and spring of rib, depth of flank, and width of chest floor are areas to concentrate on when evaluating volume and performance. Animals should appear long from end to end, deep from the top line through the underbelly, and wide from side to side of their ribs. Their depth of body should be carried through to their flank, not pinching upward, and should carry forward through the heart area, not diving inward behind the front shoulder or pinching upward through the chest floor.

Judging Condition and Trimness

Trimness and condition also refer to fat coverage on an animal. Again, a balance of moderation in fat coverage is most desirable. Assessing an animal for excess fat and adequate fat through the brisket, flank, twist, rump, and forearm will prove helpful in evaluating condition and trimness.

Breeding animals should exhibit less fat than market animals. If a heifer carries a lot of fat at one year of age, she will be a less efficient cow than a heifer on the same diet carrying minimal fat or condition. The most desirable animal is muscular, healthy, and not fat. There must be a desirable amount of muscle expression in both the sire and dam for the offspring to have the chance of developing desirable muscle. A bull will look meatier and have more overall muscle than a heifer or a cow. A bull should also have less fat than a heifer or cow. Females should show good muscling even though the muscles will not be as pronounced as in bulls.

Body Condition Scoring should be considered for females as well. Body Condition Scoring (BCS). BCS is a system of classifying breeding females by degrees of relative body fatness. In Canada, a five point scoring system is used. The fat cover over the loin area and tailhead is evaluated and scored. A condition score of 1 means the animal is extremely thin. On the other end of the scale, a BCS of 5 would mean the animal is obese. Breeding females should be in moderate to good body condition (scoring 2.5 to 3) at calving time in order to produce a strong, healthy calf, realize potential milk production, and regain the ability to cycle again for rebreeding within 60 days of calving. This condition scoring system enables producers to closely monitor and meet the nutritional needs of the cow herd. Scoring should be done prior to weaning, calving,

and breeding in order to make decisions regarding how to go forward with an animal most successfully.

Judging Structure, Soundness, and Balance

In order for any animal (market or breeding) in the beef industry to be productive, it must be structurally sound. If we think about the animal as a house, we must think of the structure of the animal as the foundation of the house. If the house's foundation is not strong, it cannot support the load of the house and the house, will eventually crumble. Such is the same for an animal if it is not structurally sound.

Animals must be structurally sound in order to travel to feed and water. Soundness can be observed through a smoothly angled shoulder, a level top and hip, and proper angle and movement of the feet and legs.

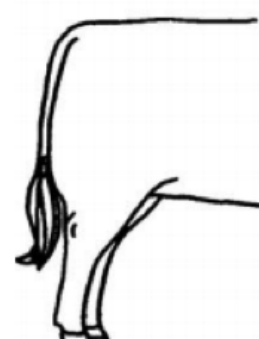
Soundness in the feet and legs is essential. The animal should move straight and true. The front hooves should point straight ahead. The back hooves may turn in a little bit at the toe. The back hooves should be set down almost straight into the front hooves when the animal walks. To see the hoof placement, look at the prints the animal makes in the dirt when it walks. The legs should be set squarely underneath the animal. They should be widely placed and straight, not bow legged, cow hocked, or weak in the pastern. The hooves should be solid and healthy with no cracks or lesions, and should not be long in the toe. The dewclaws should also be short and without any curl.



Correct



Sickle-Hocked



Post-Legged



Correct



Bow-Legged



Cow Hocked



Rear-Leg Correct Pastern Set



Rear Leg Weak Pastern Set



Correct Pastern And
Straight Front Leg



Straight Front Leg And
Weak Pastern



Back At The Knee



Buck-Kneed

Credit: <https://www.gov.mb.ca/agriculture/rural-communities/4h/pubs/judge-beef-factsheet.pdf>

Balance is all about the overall attractiveness and smoothness of an animal from front to rear.

BEEF JUDGING CHECKLIST

Feet and Legs	<input type="checkbox"/> Legs straight, square and placed wide apart. <input type="checkbox"/> No swellings, cracks or lesions in the legs or hooves.
General Appearance	<input type="checkbox"/> Appears healthy and alert. <input type="checkbox"/> Blended, smooth body. <input type="checkbox"/> Widest in the stifle. <input type="checkbox"/> Bull thick and massive. <input type="checkbox"/> Female refined with udder development. <input type="checkbox"/> Evidence of lots of muscle; little waste in the neck and brisket.
Breed Character	<input type="checkbox"/> Exhibits characteristics according to breed standards.
Fertility / Reproductive	<input type="checkbox"/> Bull <ul style="list-style-type: none"> – Rugged, massive with a high headset, crest development, superior muscling, large straight scrotum, compact sheath. <input type="checkbox"/> Female <ul style="list-style-type: none"> – Refined and smooth, pins slightly below hooks, width between pins, shows capacity and depth, udder development.
Condition	<input type="checkbox"/> Adequate conditioning for intended purpose of animal.
Structure	<input type="checkbox"/> Long over the top, long straight legs. <input type="checkbox"/> Lots of capacity and depth, large, wide hind. <input type="checkbox"/> Moves straight and with ease.

EVALUATING A CLASS

When evaluating the beef judging class, develop your own system and follow it each time you judge. Your first impression is the most important. Stand 8 to 10 meters from the class and view from a distance. Compare the animals.

When you view from the rear, compare:

- Thickness over the back, loin and rump
- Spring of fore and rear ribs
- Trimness of middle
- Muscling along the top and in the rear quarter
- Freedom from excess finish in the twist, round and pins
- Thickness through the stifle
- The set of rear feet and legs

When you view from the front, compare:

- Breed type and sex character about the head and neck
- Substance of bone
- Set of front feet and legs
- Muscling through the forearm
- Depth and width of chest
- Trimness in the throat and brisket
- Smoothness through the shoulders

When you view from the side, compare:

- Size, balance
- Length of body
- Strength of top
- Length of rump – from hooks to pins
- Levelness of rump
- Trimness of brisket and middle
- Muscle development in forearm, round, over back and loin
- Substance of bone

- Depth of rib
- Set to feet and legs
- Length of neck
- Finish over ribs and forequarters

When the animals walk, watch for:

- Style, freedom of movement
- Correct set to feet and legs
- Strength of topline
- Tightness of frame
- Those areas where you look for muscle development
- Firmness and amount of finish

When you have an opportunity to handle the animals, check for:

- Firmness
- Uniformity, smoothness and amount of finish
- Length of rump
- Muscling in the shoulder, forearm, rear quarters
- Thickness and quality of hide

GIVING REASONS

Reasons are given to explain why you placed the class the way you did. Your reasons should be brief, clear, and convincing. It is much like trying to justify to your parents why you should have your own car, why you should be allowed to have a dog, why you should have a large allowance or which outfit you should wear to school.

A set of reasons is intended to compare the differences in the articles that were judged. Your reasons explain why you placed the class the way you did. The most important reasons should be first, and the least important last. Make sure you aren't just describing the articles; you must compare them. Try to have at least two or three points for each comparison.

When giving reasons, always remember the 3 P's; be Positive, be Precise, and be Pleasant.

Discuss It!

Why give reasons for a class? Why is it important to learn how to give reasons properly? Does this skill apply to other situations?

Reasons Formatting

When you are just beginning to learn to judge, it is best to start with the simple, basic method of giving reasons. As you become more experienced, you can expand on your form, especially your terminology.

The standard format for giving reasons is provided below:

I place this class of _____, _____.
(name of class) (your placing, ex: 3,1,2,4)

I place ____ at the top of the class because _____.
(3) (explain why)

I place ____ over _____ because _____.
(3) (1) (explain why)

I place ____ over _____ because _____.
(1) (2) (explain why)

I place ____ over _____ because _____.
(2) (4) (explain why)

For these reasons I place this class of _____, _____,
(name of class) (your placing, ex: 3,1,2,4)
granting that _____ has _____.

Be sure to say at least one good attribute about each animal in the class.

Often times, the reasons that a beef judge gives at a fair are in less formal a format than that that is seen above. Each individual develops their own style over time.

The following terms are some of the terms that are acceptable in your reasons. Remember to put emphasis on the different areas depending on whether you are judging market or breeding animals.

General Terms:

- A taller, more lengthy heifer
- Carrying more uniform thickness from front to rear
- More desirable meaty type
- Female showing more balance and symmetry
- Larger, longer, trimmer, more correctly finished steer

Head, Style and Breed Character Terms:

- More feminine through the head, neck and shoulders
- Shows more desirable breed character through head, ears and neck
- Cleaner bone and more refined in the legs
- Shows more desirable balance and eye appeal
- More stylish and alert

Fore Quarter Terms:

- Fuller in the heart with a more desirable spring of rib
- More smoothly blended through the neck and shoulder
- Shows more muscle expression in the forearm

Ribs, Back and Loin Terms:

- Straighter and stronger over the topline
- Thicker, meatier, more heavily muscled loin
- More correctly finished over the top and loin

Hind Quarter Terms:

- More bulging rear quarters
- Wider, meatier steer
- Extremely thick and muscular through the center part of the round
- Freer from excess flesh in the twist
- Cleaner and trimmer in the flank
- Longer, deeper, more dimensional quarter
- Showing greater evidence of muscling through the stifle region

Legs and Bone Terms:

- Straighter, stronger legged, standing on more substance of bone
- Moves straighter and truer on the walk
- Stands more squarely on all four legs
- Longer bodied, longer hipped
- Larger framed steer

Finish and Carcass Terms:

- more uniform in his condition
- more uniform fat cover
- cleaner over the loin edge
- showing a more desirable degree of finish
- harder, firmer, and more correct in the finish over the ribs

JUDGING IN YOUR HERD

While we often think about judging beef animals in terms of show ring application, it is vital in any beef herd that animals be judged every day. The same traits that are desirable to the judge in a show ring are also desirable to any individual as they make selections for which animals to cull, what animals to buy, etc.

Judging your herd can also consist of evaluating animals as to their daily health and soundness, some of which may be conditional to their current circumstances. Animals should be evaluated to see whether they are continuing to be healthy, so that adjustments can be made in their care as needed.

Judge It!

Look at a pen of four beef cattle. Determine what type of beef animals they are and list the criteria for judging this type. Judge the animals and prepare reasons for the class.

ACTIVITY #1 LET'S MAKE A SCORE CARD

DO

Time: 15 minutes

Materials:

- A sample score card
- Chart Paper
- Markers

Instructions:

- Talk with your members about what a score card is. Use a simple score card like the one attached to discuss the contents of a good score card and how to use one in judging. Suggest to your members that they can use the score card in two ways; they can assign point values to each characteristic listed and calculate totals to rank animals, or they can assess the score card to see what characteristics are most important in the commodity based on how many points each characteristic is assigned, and then rank samples (animals) based on their ability to show strength in the areas that are most important.
- On chart paper, brainstorm with the group about all of the important factors to consider when judging beef cattle for breeding purposes (or market purposes, if you prefer) with one colour of marker.
- Use another colour of marker to circle items from the brainstorming list that are similar or could be grouped together.
- Develop a title term for each group and use that as your item to include on the score card.
- Add items to your scorecard and make notes of 2-3 detailed points to consider under each.
- Ask the group which item is most important to consider and how many points that item should be assigned out of 100. Continue with each item until the scorecard is complete.

REFLECT	Learning Outcomes: To assist members in understanding and using score cards for judging.
APPLY	Processing Prompts: <ul style="list-style-type: none">- Do you agree or disagree with the points assigned to each group of characteristics?- Are there any other characteristics you can think of that could have been included on the list?- Are score cards for all types of beef cattle the same? How might they be different?

EGGS

PERFECT SCORE

SHELL

60

- Shape: perfectly elliptical with no bumps or ridges (10)
- Shell quality: smooth, fine textured, thick shell wall. No opaque spotty patches when held to candling light. (10)
- Cleanliness: no visible dirt, spots, stains (15)
- No cracks (15)
- Egg size in sample: even, all same grade size, no eggs of foreign sizes. (10)

YOLK

20

- round, yellow-orange, well centered, stands up well
- no blood spots or meat chunks visible on opening or candling of eggs

ALBUMEN (egg white)

10

- should be reasonably firm and should not run over when egg is opened.

AIR CELL

10

- Freshness: air cell should not be more than 3 cm deep

ACTIVITY # 2
COMPARE AND CONTRAST

<p style="text-align: center; font-size: 2em; color: white;">DO</p>	<p>Time: 20 minutes</p> <p>Materials:</p> <ul style="list-style-type: none"> – A class of 4 animals of similar age, breed, and purpose (on halter if possible) <p>Instructions:</p> <ul style="list-style-type: none"> – Ask your members to consider what they feel the most important characteristic in beef animals is. – Using the first response you get, have members examine each animal in the class and come to a conclusion about which animal most ideally exemplifies that trait. For example, “Which animal in the class has the soundest set of feet and legs?” – Ask for volunteers to give reasons as to what strengths the most ideal animal has in this area and others to comment on how other animals do not exhibit as much strength. – Continue with other traits that are desirable in a beef animal.
<p style="text-align: center; font-size: 2em; color: white;">REFLECT</p>	<p>Learning Outcomes:</p> <p>To allow members to see the differences in animals for a variety of characteristics and to display what a good example of various characteristics in animals looks like.</p>
<p style="text-align: center; font-size: 2em; color: white;">APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> – Are any of the animals in the class perfect? – Is it possible to have the perfect animal? Why?/Why not? – Which animal was the best overall animal in the group? – What did you learn about judging beef cattle in this activity?

ACTIVITY # 3
TEAM JUDGING A CLASS OF 4

<p>DO</p>	<p>Time: 15 minutes</p> <p>Materials:</p> <ul style="list-style-type: none">- A class of 4 animals of similar age, breed, and purpose (on halter if possible)- Reasons templates for each member- Pens <p>Instructions:</p> <ul style="list-style-type: none">- Review the important factors to consider when judging beef animals with your members.- Ask members to place the class before them, giving them ten minutes to do so and encouraging them to work independently.- Have members make notes about each animal's strengths and weaknesses.- Ask members to pair up with another member and share their placings.- Ask each pair to come to a consensus about what their official placings should be as a team.- Ask each pair to develop a set of reasons for their placings.- Ask each pair to share their placings.
<p>REFLECT</p>	<p>Learning Outcomes:</p> <p>To have members gain confidence in judging beef animals and to have members gain knowledge about beef animals in general</p>
<p>APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none">- What did you learn about judging beef cattle in this activity?- Was it easy or difficult to come to a consensus with your partner about how to place the class?- Do you feel as though both you and your partner were able to express your opinions about placing the class?- Is it easier to judge a class independently or as a team?

ACTIVITY # 4
DESIGNING THE 'PERFECT' ANIMAL

<p style="text-align: center; font-size: 2em; color: white;">DO</p>	<p>Time: 20 minutes</p> <p>Materials:</p> <ul style="list-style-type: none"> – Chart Paper – Markers <p>Instructions:</p> <ul style="list-style-type: none"> – Divide the group into groups of 4. – Give each group a marker and 2 pieces of chart paper. – Have the groups brainstorm what qualities are ideal in a beef animal. If appropriate, assign each group a different type of animal (i.e. market steer, breeding heifer, heifer calf, mature cow, bull, etc.) – Have groups take their brainstormed ideas and use them to create the picture of a 'perfect' beef animal. Have them label their drawings with notes about the animal's perfect characteristics.
<p style="text-align: center; font-size: 2em; color: white;">REFLECT</p>	<p>Learning Outcomes:</p> <p>Learning Outcomes: To allow members to work together to determine what characteristics are ideal in a beef animal.</p>
<p style="text-align: center; font-size: 2em; color: white;">APPLY</p>	<p>Processing Prompts:</p> <ul style="list-style-type: none"> – Was it fun to get artistic in designing your animal? – How might you change your animal after seeing the other groups' animals? – What did you learn from this activity?

AT HOME ACTIVITY

Take the information that you have learned through this meeting and go forward to evaluate your own animal. Use the judging checklist to get an impression of how your animal would fare when being judged. Prepare a set of reasons that you might give for your animal, comparing them to the ideal animal.

DIGGING DEEPER 1 FOR SENIOR MEMBERS

Differences in Types of Beef Cattle

We know that there are many differences to consider between raising market animals and raising purebred breeding stock. In this meeting, we have attempted to generalize evaluating beef cattle as a whole, in an effort to simplify the process.

As we become more interested in evaluating cattle, it is vital that we distinguish the differences that there are between market and breeding animals, so that we can work toward making appropriate improvements in our animals as we are able through feeding and breeding.

Senior Member Activity:

Use the judging checklist chart below and do some online research to expand upon each line item to add what should be exhibited for a market animal and what should be exhibited for a breeding animal.

JUDGING CHECKLIST CHART

	Characteristic	Ideal appearance in market animal	Ideal appearance in breeding animal
Feet and Legs	<input type="checkbox"/> Legs straight, square and placed wide apart. <input type="checkbox"/> No swellings, cracks or lesions in the legs or hooves.		
General Appearance	<input type="checkbox"/> Appears healthy and alert. <input type="checkbox"/> Blended, smooth body. <input type="checkbox"/> Widest in the stifle. <input type="checkbox"/> Bull thick and massive. <input type="checkbox"/> Female refined with udder development. <input type="checkbox"/> Evidence of lots of muscle; little waste in the neck and brisket.		
Breed Character	<input type="checkbox"/> Exhibits characteristics according to breed standards.		
Fertility / Reproductive	<input type="checkbox"/> Bull – Rugged, massive with a high headset, crest development, superior muscling, large straight scrotum, compact sheath. <input type="checkbox"/> Female – Refined and smooth, pins slightly below hooks, width between pins, shows capacity and depth, udder development.		
Condition	<input type="checkbox"/> Adequate conditioning for intended purpose of animal.		
Structure	<input type="checkbox"/> Long over the top, long straight legs. <input type="checkbox"/> Lots of capacity and depth, large, wide hind. <input type="checkbox"/> Moves straight and with ease.		

Credit: <https://www.gov.mb.ca/agriculture/rural-communities/4h/pubs/judge-beef-factsheet.pdf>

DIGGING DEEPER 2 FOR SENIOR MEMBERS

Breed Characteristics

We know that there are hundreds of breeds of beef cattle throughout the world and that each has its own unique strengths and characteristics. Some breeds idealize long, substantial horns, while others prefer polled animals. Some breeds carry a large frame score and others are more moderate.

Senior Member Activity:

Take a look at your own breed of choice and determine what the desirable characteristics of that breed are, through doing some online research and asking fellow breeders. Then, examine your own animal and score them in relation to how they exhibit breed characteristics.