

PENNSSTATE



College of Agricultural Sciences • Cooperative Extension

REFERENCE GUIDE

4-H Dairy Beef Project



Name _____

Address _____

Name of Club _____

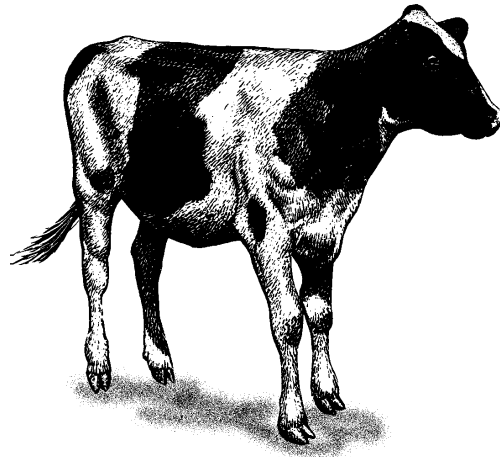
Leader's Name _____

Name of Project _____

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1

Getting Started**Introduction**

Welcome to the 4-H dairy beef feeder project! Your 4-H dairy beef project can be an unforgettable learning experience. You will do many things that will help you undergo personal growth and develop skills that will help you become a more responsible person. Skills you learn from raising a feeder calf will be valuable in the future and will carry over into other aspects of your life as a 4-H'er. We hope you will have fun, too.

This book will teach you most of the things you need to know in order to raise a 4-H dairy beef feeder project. Included are skills and information to learn and activities for you to do. Some activities everyone should do and others you may choose to do. You should complete eight activities per year. Sixteen of these activities are required and should be completed in the first two years of the project. After the first two years, eight activities should be selected from the suggested activities lists in this book or you can create your own activities with the help of your leader. Do as many of the activities as you can by yourself, but be willing to call on others for help. As you get older and advance through the dairy beef project, you should select more advanced activities to accomplish. Your parents and project leaders will be happy to teach you all they know about raising dairy beef calves!

How to Use Your Reference Guide

Your reference guide is designed to fit into a three-ring notebook with your project record books. You will receive only one reference guide for your entire 4-H career, so take care of it! It contains a checklist of things you should do and learn to complete your project. The things to do and learn are grouped into sections about dairy beef feeder calves. Each section includes:

- Objectives for that lesson
- Information about dairy beef calves and how to care for them
- Words to learn
- Ideas for presentations and talks
- Suggested activities
- Things to talk about with your leaders and other 4-H'ers

Purpose of the 4-H Dairy Beef Feeder Project

In the dairy beef project, you will learn the fundamentals of being a good beef producer and build skills that will prepare you for life. Some of the things you will learn about dairy beef management are:

- Why people raise dairy beef cattle
- How to select a project dairy beef calf
- How to feed and care for your calf
- How to keep your dairy beef calf healthy
- Normal cattle behavior
- The parts of a dairy beef steer
- The importance of quality assurance

- How to fit and show a dairy beef steer
- How to keep records
- How to prepare for the roundup

Working with your dairy beef project and taking part in 4-H activities will help you develop personally and build skills for living. These skills include:

- Being a leader
- Being a citizen
- Learning communications
- Developing personally
- Relating to people
- Behaving ethically
- Developing values
- Preparing for a career

Project Options

Three basic kinds of 4-H beef projects are:

1. Dairy Beef Calves—selection and feeding of one or more dairy beef calves to feeder weight of 400 to 800 pounds.
2. Market Steers—selection and feeding of one or more feeder steers from 400 to 800 pounds to market weight.

3. Breeding Cattle—care and management of beef cattle raised for breeding purposes. This includes:

- a. Selecting and managing one or more heifers to breeding and calving age or
- b. Managing of cows and calves (not recommended for beginning 4-H members).

You will be responsible for caring for your dairy beef calf. If you choose to take a market steer or beef breeding project, you will need a different reference book.

What Do You Need?

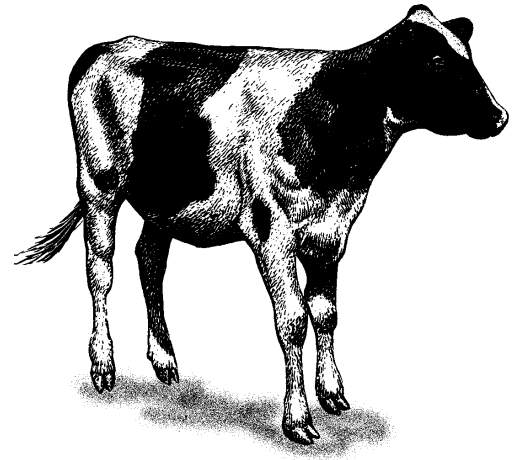
Before purchasing a dairy beef calf make sure you have everything you need to properly manage it and keep it healthy. You will need:

- An interest in dairy beef cattle
- A place to keep your calf
- Equipment for feeding, watering, and handling cattle
- Money to purchase and care for your calf
- Support from your parents and leaders





Knowledge and Skills Checklist



Dairy Beef Project Requirements

Your dairy beef project has three major parts.

1. Caring for one or more dairy beef calves each year.
2. Completing activities and learning skills needed to complete the dairy beef project. You should complete three knowledge skills, three life skills, and two quality-assurance activities each year. Sixteen activities are required. For the first two years of the project, do half of the required activities each year. A list of the required activities for the first two years is found on pages 4 and 5. After the first two years, choose eight activities from either the lists of additional activities in this book or create your own activities with your leader's approval. You may do more than the required activities if you want to. (If you have completed at least two years of another 4-H livestock project, you can skip the required life skills.)
3. Keeping records. The records you should keep are:
 - A 4-H Animal Project Record for Beginning Members (suggested for the first two or three years). Start a new one each year. More experienced 4-H'ers should keep a 4-H Livestock Record for Intermediate and Advanced Projects instead. If you have completed two years of another meat animal species (market swine, market lamb, market goat, or market beef), fill

out a "4-H Livestock Record for Intermediate and Advanced Projects."

- The Knowledge and Skills Activities Checklist found in your reference guide.
- A record of your entire 4-H career. Your leader may ask you for this information if you want to be considered for some 4-H awards.

Do the following each year:

1. Plan with your parents and leaders what you will do for your project. Decide which skills you would like to learn and activities you would like to do. Write these goals in your 4-H project record book.
2. Prepare a budget for your 4-H dairy beef project (see Section 5).
3. Select and care for one or more dairy beef calves.
4. Keep records of your goals, numbers of calves, things you do to feed and care for them, money you spend and receive, and your 4-H experiences. Write them in your 4-H project record.
5. Participate in 4-H meetings and activities.
6. Do at least eight activities (three animal skills, three life skills, and two quality-assurance skills) each year. Select half the activities from each of the required lists each of the first two years. After the first two years, choose eight activities from the lists of additional activities in this book. You may substitute other activi-

ties with your leader’s permission. Have your leader or parent sign the checklist as you finish each activity.

7. Turn in this reference manual and your project record to your leader by the due date for your club or county.

Required Dairy Beef Activities, Years 1 and 2



Choose three the first year and three the second year.

Things to Do	Date Done	Signature
Explain the meaning of these sex-related terms for cattle: cow, bull, steer, and heifer.		
Name and locate at least ten of these body parts on a live steer or diagram of a steer: quarter, twist, loin, shoulder, belly, tail, feet, knees, hocks, pasterns, brisket, ears, muzzle, heart girth, stifle, and sheath.		
Show and tell the proper way to lead and handle your dairy beef calf.		
Lead your parent or project leader on a tour of the place where you keep your calf and point out the things you are doing to take care of it.		
Name the three main things that cause cattle to get sick and at least four signs that might tell you your calf isn’t feeling well.		
Name two quality-assurance practices and tell why each is important.		

Required Life Skills Activities, Years 1 and 2



Choose three the first year and three the second year.

Things to Do	Date Done	Signature
Know and recite the 4-H pledge, club motto, and colors.		
Plan what you will do for your project with your parents or leaders each year. Write down your plan.		
Select a project dairy beef calf using your knowledge of parts and desirable types.		
Keep complete and accurate records of your goals, numbers of projects, things you did and accomplished with them, money spent and earned, and your 4-H activities in your 4-H project record book.		
Give a presentation on something you learned about cattle at a club meeting or your county presentation contest.		
Prepare an exhibit of your animal or something you made for this project at your county roundup.		

Required Quality-Assurance Skills and Activities, Years 1 and 2

Choose two the first year and two the second year.

<i>Things to Do</i>	<i>Date Done</i>	<i>Signature</i>
Properly place an ear tag in a project animal.		
Record the temperature of your refrigerator. If a medication was to be stored between 36 and 42°F, would your refrigerator be a good place to keep it?		
Make your own “sharps” container out of a plastic or metal container. Make sure the container has a lid and is properly labeled.		
Read and fill out a Pennsylvania “Animal Owner or Caretaker’s Verification of Veterinarian/Client/Patient Relationship,” found in the Farm Show Premium book.		

Additional Dairy Beef Activities, Years 3 and Beyond

Choose three of these activities each year after the first two years.

<i>Things to Do</i>	<i>Date Done</i>	<i>Signature</i>
Know what the normal body temperature of cattle is and show or tell the proper way to use a veterinary thermometer.		
Know what to look for when choosing calves for dairy beef projects.		
Name at least five breeds of dairy cattle raised in Pennsylvania and describe the characteristics of each breed.		
Study your own calf and make a list of its strong and weak points.		
Visit a fair or show and listen to the dairy beef judge give reasons for placing the feeder steers the way he or she did.		
Attend a fitting and showing clinic.		
Train and fit a dairy beef steer for show.		
Show a dairy beef steer at a fair or roundup.		
Visit an auction to learn how cattle are bought and sold.		
Visit a dairy beef feedlot and learn about the feeding and watering system. Also observe how the owner keeps cattle comfortable.		
Describe the normal sounds and behavior of dairy beef calf.		

continued

Things to Do	Date Done	Signature
Using your knowledge of quality assurance, develop a medication record for your project animal. Attach it to your project book.		
Label the wholesale or primal cuts of beef on a diagram of a beef carcass.		
Name four or more nutrients people get from eating beef and tell a use for each in the human body.		
Learn the signs of a sick calf and observe your calf for these signs. Record any signs you observe.		
Identify and describe at least three parasitic diseases commonly found in cattle.		
Name three or more examples of beef by-products.		
Make a kit filled with first-aid supplies and equipment needed to care for and keep your calf healthy.		
Do a dairy beef activity not named on this list.		
Graph futures prices for a feed grain (such as corn) over an eight-week period.		
Graph futures prices for market and feeder steers over an eight-week period.		
Find ten Web sites about selecting, feeding, or showing steers.		
Describe important nutritional components in feed.		

Additional Life Skills Activities, Years 3 and Beyond

Choose three of these activities each year after the first two years.

Things to Do	Date Done	Signature
Lead the Pledge of Allegiance at a 4-H meeting.		
Lead the 4-H Pledge at a 4-H meeting.		
Lead a song or game at a 4-H meeting.		
Serve as a committee member.		
Serve as chairperson of a committee.		
Serve as an officer of your club.		

continued

Things to Do	Date Done	Signature
Help plan your club's yearly program.		
Help with a fund-raiser for 4-H.		
Help with a parents' night or club achievement program.		
Help with a 4-H event or activity.		
Help with a community service project.		
Give a committee or officer's report to your club.		
Give a talk to your club about something you learned or did with your project animal.		
Give a presentation or talk to a group other than your club.		
Act out a skit or pretend you are making a radio or television commercial about 4-H or dairy beef.		
Make a poster to tell people about 4-H or something you have learned in this project.		
Help prepare a booth or window display to tell about dairy beef or 4-H.		
Help prepare a parade float to tell about dairy beef or 4-H.		
Help to educate the public about the benefits of raising cattle or using beef, leather, or other by-products.		
Write a letter to someone you want to buy your dairy beef. Explain why he or she should buy your calf.		
Write a thank-you letter to a buyer of your dairy beef or someone who helped you or your 4-H club.		
Write a news story about your club or your project for a local paper or a 4-H newsletter.		
Bring a friend who is not a 4-H member to a 4-H meeting or activity to interest him or her in 4-H.		
Attend a 4-H camp or overnigher		
Attend a livestock or meats judging practice session, workshop, or clinic.		
Participate in a skill-a-thon contest.		
Help another 4-H'er with a project.		

continued

Things to Do**Date Done****Signature**

Teach a dairy beef skill to another 4-H member.

Start a scrapbook of photos, newspaper clippings, ribbons, and other materials related to your 4-H experiences.

Develop your own activity with your leader's approval.

Additional Quality-Assurance Skills and Activities, Years 3 and Beyond

Choose two of these activities each year after the first two years.

Things to Do**Date Done****Signature****IDENTIFY AND TRACK ALL TREATED ANIMALS.**

- Properly place a tattoo in the ear of a project animal.

- Show your leader how to properly read swine ear notches.

- Research and do an educational talk for other club members about methods of electronic animal identification.

- List for your leader at least three alternate methods of animal identification besides ear tags, tattoos, ear notches, and electronic identification. Label each as permanent or temporary.

- Describe to your leader how a pen, lot, or room could be used as a method of identification for treated animals.

MAINTAIN MEDICATION AND TREATMENT RECORDS.

- Create and show your leader a "barn copy" of the medication and treatment record found in your record book. Describe where it is kept near your project animal's pen.

- Draw 3 ccs of water using a disposable syringe (without the needle). Pretend you are giving this dosage to your project animal. Write down how you would record it on your medication and treatment record (you're giving the injection in the muscle and there is no withdrawal period for water).

- Visit a feed store and ask for copies of medicated and unmedicated feed tags. Write down how you would record the medicated feed on your medication and treatment record.

- Explain to your leader why recording *who* gave a medication on the medication and treatment record is important.

continued

Things to Do	Date Done	Signature
<ul style="list-style-type: none"> • Answer this question to your leader’s satisfaction: Should routine worming treatments be included on the medication and treatment record? Why or why not? 		
<ul style="list-style-type: none"> • Write a scenario in which keeping medication and treatment records from your project for at least twelve months after the animal is slaughtered would be important. 		
<p>PROPERLY STORE, LABEL, AND ACCOUNT FOR ALL DRUG PRODUCTS AND MEDICATED FEEDS.</p>		
<ul style="list-style-type: none"> • Make a list of all drug products and medicated feeds on your farm. (If you don’t have any medications, ask a farmer if you can inventory his or her drug products.) Record the expiration dates. 		
<ul style="list-style-type: none"> • Explain to your leader why drug products have expiration dates. Why should drugs that have passed their expiration dates be discarded? 		
<ul style="list-style-type: none"> • List all pieces of information that can be found on a drug product label. Tell why each is important. 		
<ul style="list-style-type: none"> • Ask a veterinarian how you should properly dispose of a full “sharps” container. Report your findings to your leader. 		
<p>OBTAIN AND USE ONLY VETERINARIAN-PRESCRIPTION DRUGS BASED ON A VALID VETERINARIAN/CLIENT/PATIENT RELATIONSHIP (VCPR).</p>		
<ul style="list-style-type: none"> • Tell your leader the difference between prescription and over-the-counter drugs. Give an example of each. 		
<ul style="list-style-type: none"> • Tell your leader how to calculate the new withdrawal period for a medication if a veterinarian told you to administer twice the dosage listed on the label. (Trick question!) 		
<ul style="list-style-type: none"> • In your own words, write the criteria for a valid veterinarian/client/patient relationship. 		
<ul style="list-style-type: none"> • Who would be a better provider of medication advice for a sick animal—a veterinarian or a farmer? Tell your leader why. 		
<ul style="list-style-type: none"> • Tell your leader the difference between “extra-label” and “off-label” medication use. 		
<ul style="list-style-type: none"> • List five things that if changed from label directions would constitute extra-label use. 		

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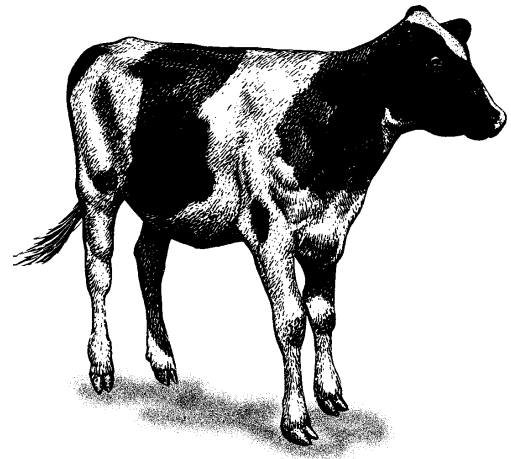
Things to Do	Date Done	Signature
USE PROPER ADMINISTRATION TECHNIQUE AND WITHDRAWAL TIMES.		
<ul style="list-style-type: none">Using a live animal and syringe (or suitable substitute), describe how and where you would give an intramuscular and a subcutaneous injection.		
<ul style="list-style-type: none">Research needle gauge sizes. What is an appropriate gauge and needle length for injecting a mature cow? A baby pig? A lamb?		
<ul style="list-style-type: none">Write a paragraph explaining why intramuscular injections should always be given in the neck.		
<ul style="list-style-type: none">Using a pair of pliers and extreme caution, bend and straighten a disposable needle. Count the number of times you can bend and straighten the needle before it breaks. Tell your leader why bent needles should never be reused and where and how you dispose of used needles.		
<ul style="list-style-type: none">Show your leader how you would restrain your animal for an injection.		
<ul style="list-style-type: none">Calculate the dosage and withdrawal time for a medication labeled to be injected at 2 ccs per 5 pounds of body weight. Assume you are giving it to your project animal today. Withdrawal time is 10 days. Prove to your leader when the animal would be safe for slaughter.		
<ul style="list-style-type: none">Find a feed store feed tag with a withdrawal period of at least 5 days.		
USE DRUG RESIDUE TESTS WHEN APPROPRIATE.		
<ul style="list-style-type: none">Demonstrate drug residues using either chocolate milk or breakfast cereal.		
<ul style="list-style-type: none">Research ELISA tests used to test for drug residues. Explain to your leader how to accomplish one of these tests.		
ESTABLISH AN EFFICIENT AND EFFECTIVE HERD HEALTH MANAGEMENT PLAN.		
<ul style="list-style-type: none">List the pros and cons of purchasing a project animal at an auction barn. List the pros and cons of purchasing a project animal from an individual.		
<ul style="list-style-type: none">Make a biosecurity plan to keep your animals from getting sick. Include a rodent and bird control program.		

continued

<i>Things to Do</i>	<i>Date Done</i>	<i>Signature</i>
<ul style="list-style-type: none"> List five things you do to make sure your calf produces a safe, wholesome carcass. 		
<ul style="list-style-type: none"> Tell your leader the difference between a modified-live vaccine and a killed vaccine. 		
<ul style="list-style-type: none"> Look up three potential vaccines you could use for the same disease in a veterinary supply catalog. List each as a modified-live or killed vaccine. Describe any differences in the method or frequency of administration. 		
<ul style="list-style-type: none"> List one disease for which your project animal should be vaccinated. Classify that disease as respiratory, digestive, or reproductive. 		
PROVIDE PROPER ANIMAL CARE.		
<ul style="list-style-type: none"> List each ingredient in your animal's feed tag as a protein source, energy source, vitamin, or mineral source. 		
<ul style="list-style-type: none"> Tell your leader the main purpose of protein, energy, water, vitamins, and minerals in an animal's diet. 		
<ul style="list-style-type: none"> Write a plan of how you will load your project animal from your facility. Include details on how you will keep from bruising the animal's carcass. 		
<ul style="list-style-type: none"> Describe the watering system for your animals. Would you honestly drink from the animal's water source? List ways to improve your watering system. 		
FOLLOW APPROPRIATE FEED PROCESSOR PROCEDURES.		
<ul style="list-style-type: none"> Evaluate your feed storage area. Could your feed be contaminated by medicated feed, bird droppings, rodents, or chemicals? Create a plan for improving your feed storage area. 		
<ul style="list-style-type: none"> Weigh the amount of feed your animals eat every day. Do they waste any feed? If that wasted feed contained medication, could the animals access that medicated feed at a later date? Develop a plan to reduce wasted feed. 		
<ul style="list-style-type: none"> Describe to your leader differences among ground meal feeds, pelleted feeds, rolled feeds, and cracked feeds. Collect a sample of each. Which are in your project animal's diet? 		



Background Information



There are some things you should know about dairy beef cattle before you get started.

Objectives

After studying the materials and completing the suggested activities for this section of your project you should be able to:

1. Write the scientific names for two species of cattle.
2. Explain differences among the terms cattle, calf, bovine, feeder calf, feeder cattle, cow, steer, finished steer, heifer, bull, and stag.
3. Identify three markets for most dairy beef calves.

Why Do We Raise Dairy Beef?

A dairy beef animal is generally a male of dairy breed descent that is used for meat production. Dairy beef calves are by-products of the dairy industry. Many dairy farmers do not have any need for bull calves. Therefore, bull calves are castrated for use in meat production. Feedlot owners, dairy producers, and 4-H members are showing more interest in dairy beef production. A properly fed dairy steer can meet today's consumer demand for flavorful, tender meat.

The dairy beef project is a logical way for members carrying dairy cow projects to use and sell their bull calves. It is also more reasonable for many rural, but nonfarm families to raise a 400- to 800-pound animal than it is to raise a larger, traditional market steer.

Before you purchase your first calf for your dairy beef project, you must realize and accept that at the end of the project, your calf's purpose is to produce meat for people to eat.

What Do We Call Cattle?

Cattle are classified by two scientific names. *Bos Taurus* includes most beef and dairy breeds in the United States. *Bos Indicus* are cattle with humps on their necks and long ears and are normally found in tropical climates. "Cattle" is a general term used to encompass all animals in both species and is often interchanged with "bovine." "Beef cattle" refers to animals of either species when they are specifically bred for meat production. A "calf" is any young bovine up to a year of age. "Feeder calf" is a term usually associated with calves after weaning but before placement in a feedlot.

Cattle have different names depending on sex. "Heifers" are young female cattle before they have had their first calves. "Feeder cattle" are generally considered to be calves between 400 and 800 pounds that are not yet ready for slaughter. "Steers" are castrated male cattle. "Finished steers" are steers ready for slaughter. "Cows" are female cattle after they have calved the first time. "Bulls" are uncastrated male cattle. "Stags" are incompletely or improperly castrated bulls.

The Dairy Beef Industry in the United States

Dairy calves are generally weaned soon after birth so that the cow can reenter the milking herd. Most

calves are castrated and fed for beef or veal production, while dairy heifers are retained for a future life in the milking herd. The major difference between dairy beef production and traditional beef production occurs in the first seven months of life. Dairy beef calves are fed specially formulated diets during this period while beef calves nurse their mothers.

Many dairy beef calves are sold at less than one week of age to one of three markets. The first market is for “bob” veal. These calves are slaughtered almost immediately for veal production. The second market is for “fed” veal. These calves are fed an all-milk diet and slaughtered at 400 to 600 pounds. Meat from fed veal calves is very light in color, extremely tender, and is often served in exclusive restaurants.

The third market is for traditional beef production where steers are fed a high-energy diet in feedlots to approximately 1,300 pounds. However, unlike beef steers, dairy steers destined for traditional beef production must be fed a high-energy diet from weaning until about seven months of age when they are placed in a feedlot.

Most larger feedlots are in western states such as Texas, Nebraska, Kansas, Oklahoma, and Colorado. Large feedlots in these states would commonly have capacity for 30,000 to 50,000 head of cattle. Pennsylvania feedlots are normally smaller than those found in the west. A typical Pennsylvania feedlot producer would feed about 100 to 300 head of cattle at a time, although some Pennsylvania feedlots are capable of housing 600 to 800 head.

Your job with your dairy beef project is to wean a calf and place it on a high-energy diet in preparation for entering a feedlot.

Words You Should Know

Beef cattle: Cattle raised specifically for meat production.

***Bos taurus* / *Bos indicus*:** Scientific names for domestic beef cattle.

Bull: A male bovine that has not been castrated.

Calf: Young cattle less than a year old.

Castration: Removal of a male’s testes.

Cattle/bovine: Generic term for all *Bos taurus*/*Bos indicus*.

Cow: A female bovine that has had at least one calf.

Feeder calf or cattle: A weaned calf before placement in a feedlot.

Feedlot producers: Cattle producers who feed feeder or backgrounded cattle on a high-energy ration to slaughter weight of 1,000 to 1,400 pounds.

Finished steer: Steer fed a high-energy diet and ready for slaughter.

Heifer: A young female bovine that has not calved.

Ration or diet: Mixture of feed given to an animal, usually daily.

Steer: A male bovine that was castrated at a young age.

Stag: Improperly or incompletely castrated bull.

Suggested Activities

- Make a chart of the different names used for cattle.
- Have members of your club answer roll call at a meeting with one of the terms used in this section.
- Name some “high-energy” foods that people eat.



Fed veal carcasses

Extra Activities to Try

- Ask a local beef producer if the names they use for beef cattle mean the same thing as the names you've learned.
- Visit a veal producer to find out how veal calves are purchased, fed, and sold.

Ideas for Presentations and Talks

- The history of cattle domestication
- Uses of dairy bull calves
- Changes in the dairy beef industry
- Advantages and disadvantages of using sexed semen to produce a higher proportion of heifer calves from dairy cows

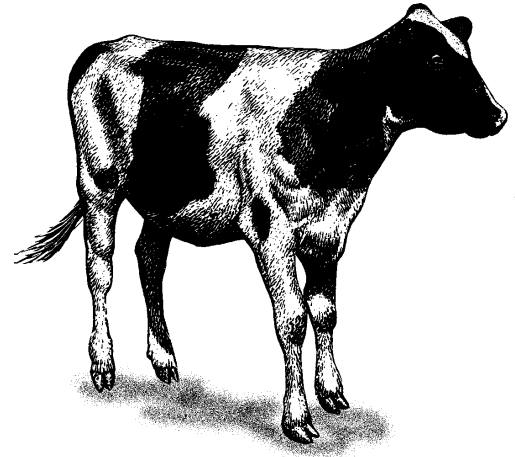
Things to Talk About

- How will you react when your project steer is sold to a feedlot?
- Why would a dairy producer want to retain ownership of dairy steer calves through slaughter?



4

Breeds of Dairy Cattle



Six major breeds of dairy cattle are present in the United States. All are represented within Pennsylvania's borders.

Objectives

After studying the materials and completing the suggested activities for this section of your project, you should be able to:

1. Name the major breeds of dairy cattle raised in Pennsylvania.
2. Identify the major breeds from looking at photos or from seeing live animals.
3. Identify and describe the important characteristics of your selected breed of dairy beef cattle.
4. List some advantages and disadvantages of dairy breeds if used as dairy beef animals.

Major Breeds

Six breeds of dairy cattle are commonly raised in Pennsylvania. Each breed has characteristics that distinguish it from other breeds.

The reason dairy producers choose to raise a particular breed of cattle is because that breed has a combination of qualities producers want to have in their herds. For example, some breeds produce more milk while other breeds produce milk with a higher butterfat content. Still other breeds may be better suited for grazing operations. Rarely do dairy producers select dairy cattle for their meat production or carcass characteristics.

Before you fall in love with one breed, you should know that some counties require all 4-H

dairy feeder calves to be Holsteins.

The six dairy breeds raised in Pennsylvania and their characteristics are listed below.

Breed Characteristics

Ayrshire: Scotland origin. Red and white in color. Medium in size. Strong, thrifty calves.

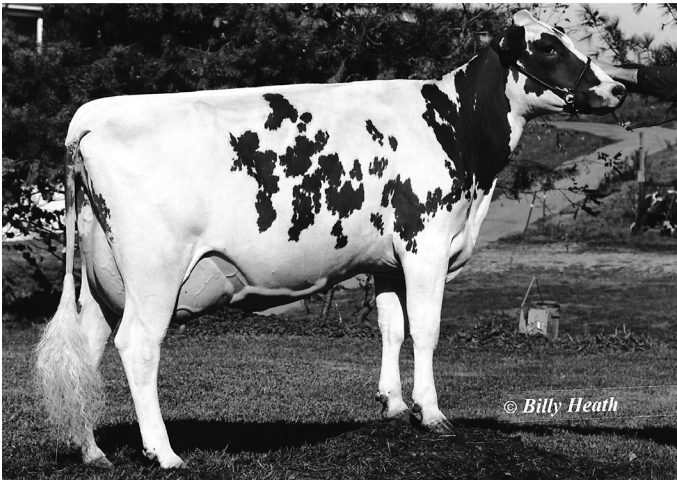
Brown Swiss: Switzerland origin. Light to dark brown or gray color. Large in stature. Known for their ruggedness and easy-going personalities. Originally developed as a dual-purpose breed to produce both meat and milk, thus carcasses are often heavier muscled than some of the other breeds.

Guernsey: Originated from Isle of Guernsey, located in the English Channel. Fawn and white in color with yellowish skin. Their fat is yellow in color, which often is reflected in lowered value, less desirable carcasses.

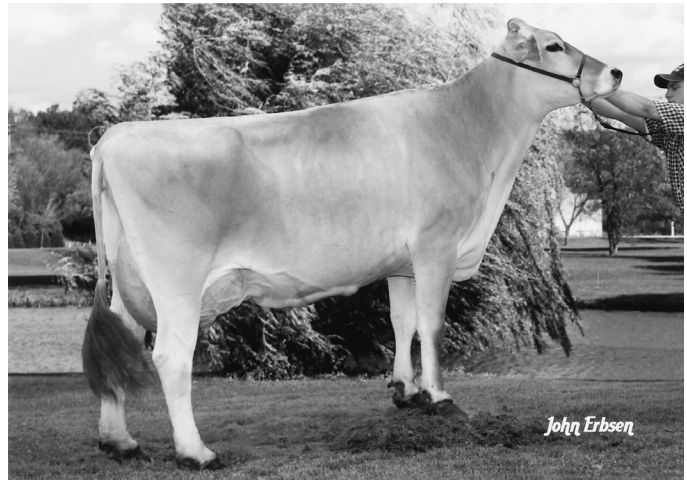
Holstein: Europe origin. Black and white or red and white in color. Most popular breed in the United States. Large-framed, stylish cattle. Known for growth and lean carcasses.

Jersey: From the British Island of Jersey. Fawn, cream, mousy gray, or brown colored with black tail and muzzle. Small in size. Relatively light-muscled carcasses.

Milking Shorthorn: England descent. Red, red and white, white, or red roan in color. Large-stature cattle.



Ayrshire



Brown Swiss



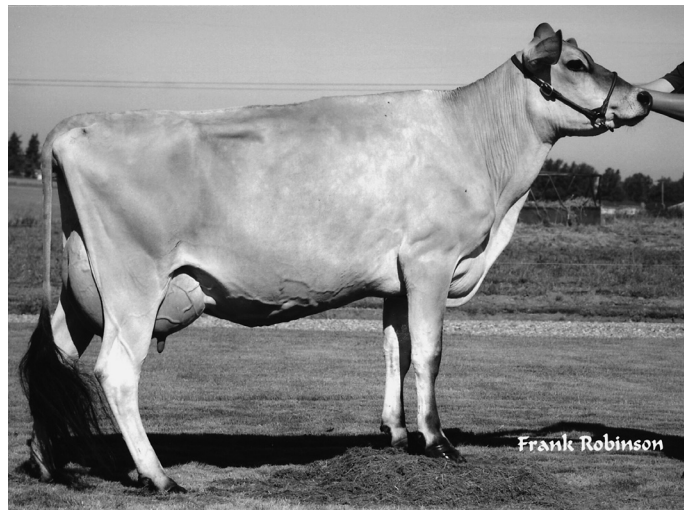
Guernsey



Holstein



Milking Shorthorn



Jersey

Suggested Activities

- Answer the roll call at a meeting with the name of a major dairy breed.
- Look through dairy magazines to find pictures of different breeds of dairy cattle. Make a poster or display with pictures of the major breeds. Describe the special uses and features of each breed pictured.
- Visit a fair or show and try to identify the different dairy breeds present.
- Write to the breed association to find out more about the breed of your project calf. Be able to describe what is special about the breed you have chosen.
- Make a poster to promote or advertise your favorite dairy breed.
- Visit three breed association Web sites.

Extra Activities to Try

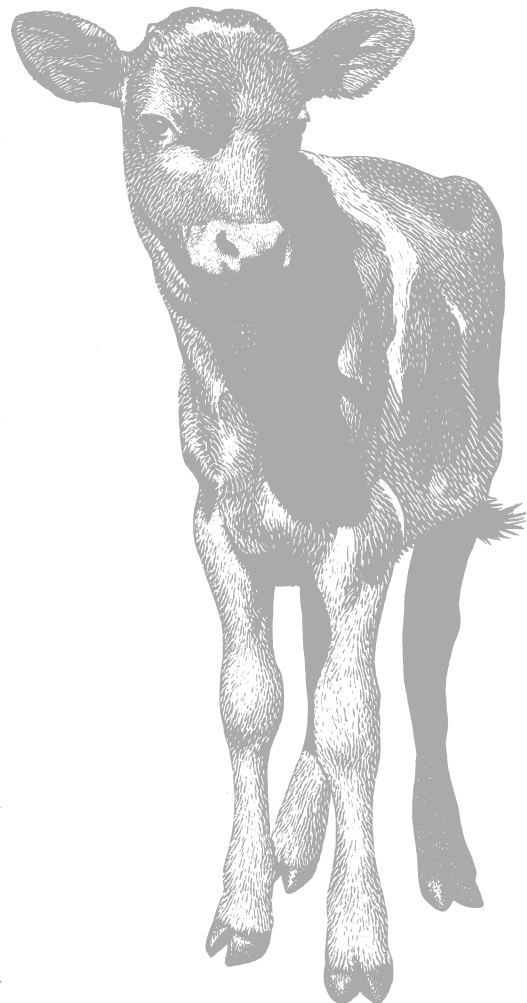
- Discuss with a dairy producer which breed traits are important to a breeding program and why they are important to a herd.
- Ask the manager or owner of a dairy operation why he or she raises a particular breed of cattle.
- Examine the registration papers of a registered dairy animal. Be able to name the sire and dam.

Ideas for Presentations and Talks

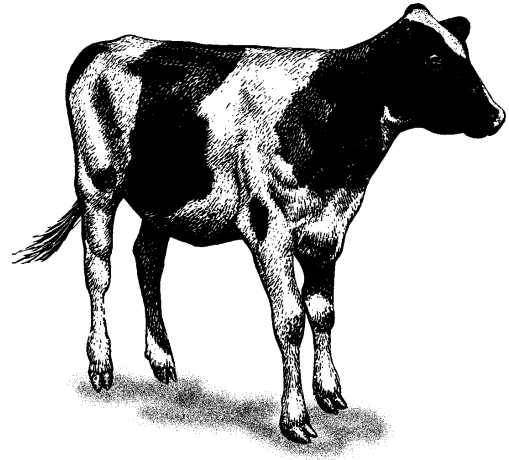
- Make a poster with photos or drawings of the major breeds of dairy cattle and use it to lead a discussion on the different characteristics of each breed.
- Describe the important characteristics of a certain breed of cattle and tell why these characteristics are desirable.

Things to Talk About

- What are the major breeds of dairy cattle raised in Pennsylvania?
- What are the characteristics associated with each breed of dairy cattle?
- Why are some Holsteins red and white while most are black and white?



5

*Selecting
Project
Animals*

The conformation, health, and frame size of the calf you choose will affect the success of your project. Try to choose healthy, high-quality, muscular, and structurally correct cattle that are relatively short of stature. You don't need the most expensive animals to succeed.

Objectives

After studying these materials and completing the suggested activities, you should be able to:

1. Name the external parts of the steer and be able to point them out on a live steer or label them on a diagram.
2. Tell the difference between yield and quality grade.
3. Explain what to look for when choosing animals for dairy steer projects.
4. Prepare a budget for your dairy beef project.
5. Select a project calf based on breed, projected frame size, and estimated finished weight

Naming External Parts of a Calf

Knowing the words used by beef producers is important. When you know and use the right words, other people who raise beef cattle will be able to understand you.

The parts of a steer's body have special names. Some parts have the same names as the meat products produced from them. For example, the back of a steer directly above the ribs is called the rib and is where ribeye steaks come from.

Learn the terms listed on the diagram on page 19. On a heifer or cow, you should also be able to identify the udder and vulva. On a bull, you should be able to locate the scrotum and testes.

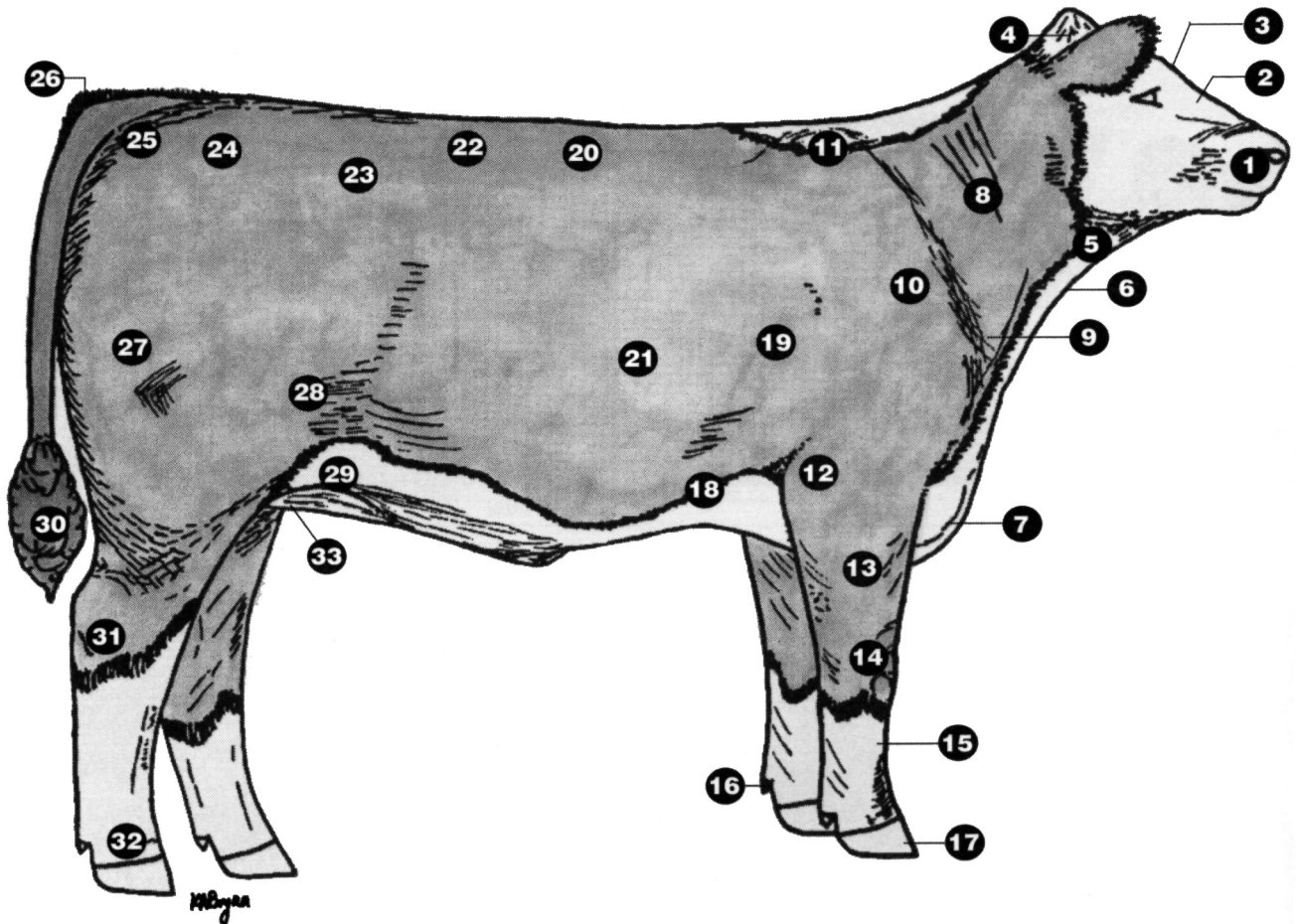
Things You Need to Know

Even though your calf will not be sold directly to a packer, how you feed and care for your calf during its first six or seven months of life plays a large role in your steer's final finished weight and quality grade at slaughter. Therefore, you need to understand the three factors that influence the price paid for finished cattle.

The first factor is carcass weight. Ideally, packers prefer beef carcasses between 650 and 800 pounds. Carcasses of this weight produce steaks and roasts of the size consumers want to buy. Normally, between 57 and 61 percent of the live weight of a dairy beef steer ends up as carcass weight, so live cattle between 1,150 and 1,350 pounds will be most likely to produce carcasses in the preferred weight range.

The second factor that influences the price paid for finished cattle is quality grade. Assuming they are receiving an adequate diet with sufficient energy, steers tend to deposit fat as they reach market weight. External fat deposited over the ribs, back, and brisket is easily seen by looking at the steer. At the same time, the steer deposits small amounts of fat inside the muscle tissue. This small amount of intramuscular fat is called marbling and gives meat flavor and juiciness.

EXTERNAL PARTS OF THE STEER



- | | | | | | |
|----|-------------------|----|---------------------------|----|-------------|
| 1 | muzzle | 12 | elbow | 23 | hook or hip |
| 2 | face | 13 | forearm | 24 | rump |
| 3 | forehead | 14 | knee | 25 | pin bone |
| 4 | poll | 15 | cannon | 26 | tailhead |
| 5 | throat | 16 | dewclaw | 27 | quarter |
| 6 | dewlap | 17 | hoof | 28 | stifle |
| 7 | brisket | 18 | lower forerib, fore flank | 29 | rear flank |
| 8 | neck | 19 | forerib | 30 | switch |
| 9 | point of shoulder | 20 | back or top | 31 | hock |
| 10 | shoulder | 21 | rib | 32 | pastern |
| 11 | top of shoulder | 22 | loin | 33 | cod |

When a steer is slaughtered, its carcass is cut between the twelfth and thirteenth rib. A beef grader from the U.S. Department of Agriculture (USDA) visually evaluates the amount of marbling in the ribeye muscle. The grader also studies the degree of hardness (or calcification) of certain bones in the carcass to determine the animal's age. If enough marbling is present in the muscle tissue and the grader decides the animal was less than thirty months of age according to the observed bone calcification, the carcass receives a USDA quality grade of "choice." Carcasses that receive the choice grade are usually more valuable than those that receive a "select" or "standard" grade because consumers are willing to pay more for meat that is juicy and flavorful. About 70 percent of steers with at least 0.4 inches of backfat (fat over the ribeye muscle between the twelfth and thirteenth ribs) have enough marbling to grade choice. Steers with 0.4 inches of backfat are said to be "ideally finished" and should generally have enough marbling to grade choice.

The third factor is yield grade. If steers deposit too much external fat or are too light muscled, their value is lowered even though they may receive the choice quality grade. Yield grade is used to evaluate the percentage of lean meat in a carcass. Yield grades range from 1 to 5. A yield grade of 1 indicates a very lean, heavily muscled carcass. Few yield grade 1 carcasses have enough marbling to grade choice. An extremely light-muscled, fat carcass would receive a yield grade of 5. Dairy beef steers generally have less overall carcass muscling than beef steers. Therefore, overly fat dairy steers would be likely to receive a yield grade of 4 or 5.

Four pieces of information are needed to calculate yield grades of beef carcasses:

- **External fat thickness over the ribeye.** Measured in tenths of an inch three-quarters of the distance from the midline to the bottom of the ribeye muscle between the twelfth and thirteenth rib. This thickness may be adjusted up or down based on the relative fatness of the rest

of the carcass.

- **Hot carcass weight in pounds.**
- **Ribeye area.** Measured in square inches between the twelfth and thirteenth rib.
- **Kidney, pelvic, and heart fat percentage.** Estimated as a percentage of hot carcass weight. Average is 3.5 percent.

The exact formula for calculating yield grade is:

$$2.50 + (2.50 \times \text{adjusted fat thickness}) + (0.20 \times \text{percent kidney, pelvic, and heart fat}) + (0.0038 \times \text{hot carcass weight in pounds}) - (0.32 \times \text{ribeye area in square inches})$$

Selecting a Calf

4-H dairy beef projects are can be classified into three categories—birth to feeder, feeder to finisher, or birth to finish.

Dairy beef projects in Pennsylvania are usually obtained shortly after birth. These calves can be acquired from your own dairy herd or purchased from a local dairy farmer. If you are purchasing from a local dairy farmer, contacting the farm ahead of time is important. Let the dairy farmer know approximately what dates would be best for you to get the calf and how old you would like your calf to be. Many times, dairy farmers sell their bull calves shortly after birth, so you need to give the dairy farmer plenty of notice. If you must purchase a calf from a sale barn, realize that calves are very susceptible to getting sick when they are stressed and mixed with other animals. Calves from various locations are often housed together at sale barns, which allows for more contact with diseases.

When selecting a bull calf, the following must be considered:

- **Date of birth.** When do you plan to sell the calf and at what age and weight? Many times, fairs and local 4-H programs will set required birth dates so that feeder calf buyers and, ultimately, packers will have a consistent set of similar-sized calves to finish and slaughter.

- **Breed of the Calf.** Larger dairy breeds often produce meatier carcasses. Thus, Holstein and Brown Swiss are more acceptable as dairy beef. Jersey animals are usually smaller, more refined animals and tend to yield a lighter-muscled carcass. Guernseys often receive demerits from the packers because of yellow-colored fat. Consumers discriminate against yellow fat, and packer prices are lower for these carcasses. In some counties, all dairy beef feeder calves must be 100 percent black and white Holstein. Check your county rules before selecting a breed.
- **Frame Size of the Calf.** The size of the calf is an important feature to consider. Larger calves tend to become heavier feeder steers. However, smaller-framed steers tend to be thicker and produce heavier-muscled carcasses. Calves from dairy herds that produce “type” dairy females tend to produce steers with too much frame to be good dairy feeder calves.
- **Conformation and Balance of the Calf.** Conformation is the way the entire body structure is put together. Structural correctness is essen-

tial in ensuring that the calf can compete for feed with other steers in a feedlot. Balance is more important from a show standpoint. The conformation flaws seen at birth will rarely change as the calf grows. A shallow-bodied, bow-legged, heavy-fronted calf will have those same characteristics as a feeder and finished steer.

- **Muscling of the Calf.** Even as young as one day old, a calf’s muscle structure is evident. When selecting a calf, compare the calves. The easiest place to look for muscling on a newborn is in the hindquarters. Look at your calf from behind and observe the muscles across the rump and down the hindquarters. Natural muscling will also be visible in the stifle area. Calves should stand naturally with their rear legs wide apart.
- **Health of the Calf.** Newborn calves can get sick very easily in the first few weeks of age, especially if they did not get enough colostrum. Simply transporting the calf to your home causes stress. Look for signs of illness right



away. Scours, lethargy, and/or a runny nose are warning signs that your calf is already feeling under the weather.

Deciding How Much to Pay

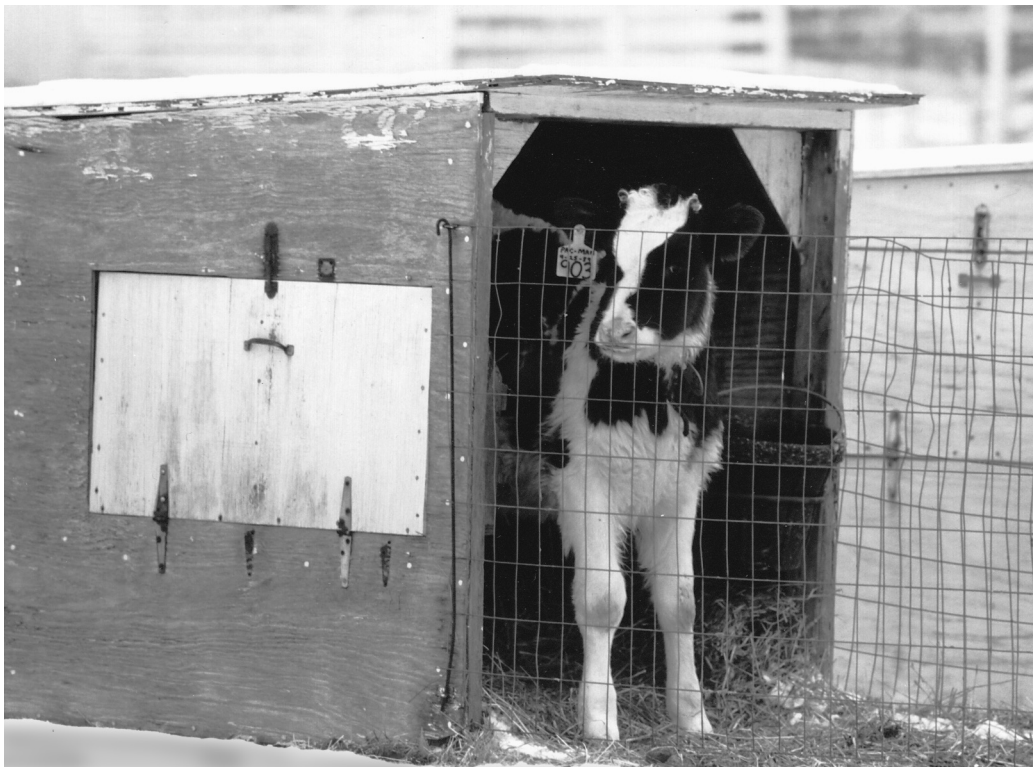
4-H dairy beef projects are best purchased directly from a dairy farm. Calves may also be bought at livestock auctions, but these calves have a greater chance of getting sick because they have been around cattle from many other farms.

Farmers who feed and sell cattle for a living need to get more than the cost to raise them when they sell their cattle, or they will lose money. If you pay too much for your steer or spend too much to feed and care for it and do not get a high enough price when you sell it, you will lose money, too.

Before you purchase a calf, you need to fill out a budget for your entire project (see the sample budget on the next page). To decide how much you can afford to spend on a calf, first estimate what it will be worth when you will sell it. Sub-

tract what you think it will cost to pay for feed (see “How Much Will Your Calf Eat?” to estimate how much feed will be required), veterinary care, supplies, transportation, bedding, marketing costs, entry fees, interest on borrowed money, and other costs. After subtracting these projected expenses, you’ll know how much you can afford to pay for your feeder steer.

Calves, especially champions, sold at 4-H auctions often sell for more money than feeders sold at a local sale barn. Most 4-H steers will not be champions, so don’t expect a grand champion price when you make your plans for the year. Real-world prices for cattle change from day to day, so it’s a good idea to follow market reports in farm newspapers or on the radio to find out what fed cattle are worth. If you have access to previous year’s average sale price for dairy feeders (not including champions) from your junior livestock sale, you could use that as a basis for estimating income.



DAIRY BEEF BUDGET

Receipts

Sell feeder steer Weight () x cents per pound () = value

Premiums

Total receipts

Expenses

Feed—milk replacer Bags needed () x cost per bag () = milk replacer cost

Feed—grain Pounds grain needed () x cost per pound () = grain cost

Feed—hay Pounds hay needed () x cost per pound () = hay cost

Total feed cost (milk replacer plus hay plus grain cost)

Calf cost

Bedding

Veterinary cost (including vaccines and medications)

Supplies

Transportation

Marketing costs

Entry fees

Interest on borrowed money

Other

Total expenses

RECEIPTS – EXPENSES = PROFIT (OR LOSS)



When You Get Your Calf Home

Make sure you have a good place to keep your calf before it arrives. Baby calves should have a clean, draft-free pen, stall, or hutch. Bedding will help keep your calf comfortable and clean. Make sure the pen is not sealed too tight since your calf needs fresh air to breathe.

When you get your calf home, make sure you have milk replacer and calf starter on hand. You should also have a clean bucket in which to offer your calf clean water.

If not previously done, two management practices—dehorning and castration—must be accomplished shortly after you get your calf home.

DEHORNING

Most calves will develop horns. Some strains of cattle are hornless or “polled,” but most dairy calves start showing signs of horn growth at three to four weeks of age (sometimes younger). Horns can be dangerous to other cattle and to humans who work with cattle. Therefore, these baby horns must be removed using one of several methods.

If horns are observed when the calf is less than two weeks of age, a caustic paste (available from a veterinarian or livestock supply catalog) will destroy the horn tissue before it has a chance to even get started. Similarly, bloodless dehorning can be done using a burning tool that sears the horn tissue around the horn’s base. Finally, if the

horn is too large for either of these methods, it can be surgically removed using a special dehorning tool. This final option can cause some bleeding and opens a potential route for infection.

CASTRATION

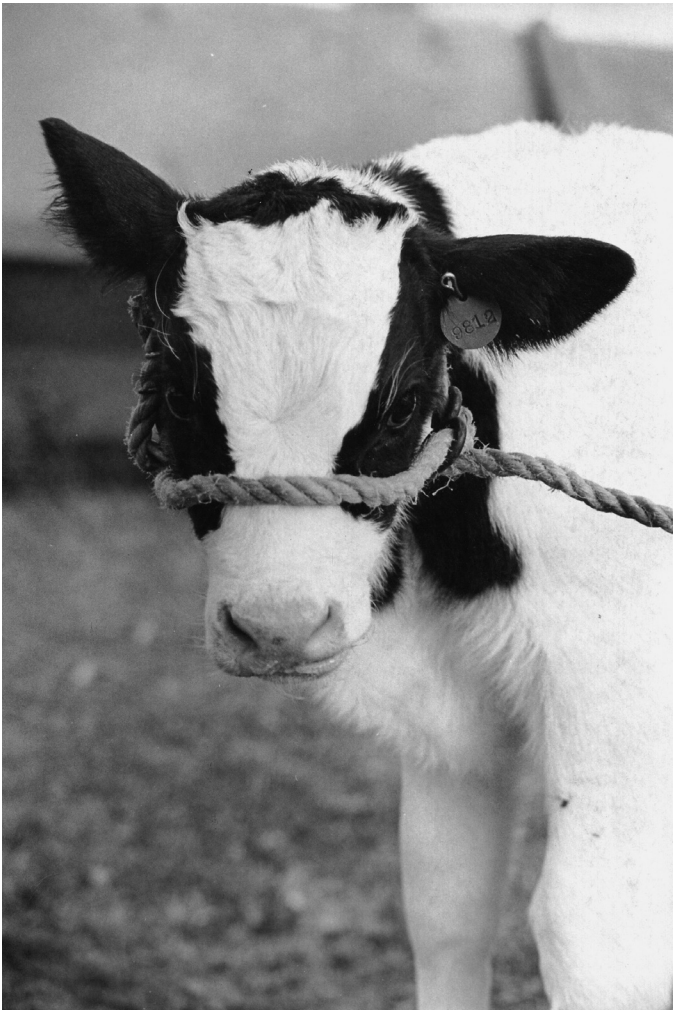
Your dairy beef project must be shown as a steer. Thus, the testicles and associated hormones must be removed. Although these hormones keep steers from growing as fast and efficiently as uncastrated bulls, they also prevent desirable fat deposition and can make calves mean tempered! You have several options to castrate your calf, but no matter which one you choose, castration should be accomplished when calves are young.

Surgical castration using a knife or scalpel is the preferred method. With surgical castration, the bottom part of the scrotum is cut off and the testicles removed. This is the one method that ensures complete castration.

Emasculation is a bloodless castration method that uses a special tool (emasculator) to crush the blood vessels and cords between the animal’s body and the testicles. In about 4 to six weeks, due to lack of blood supply, the testicles atrophy (shrink and become useless). Although a bloodless method, improper emasculation can result in incomplete crushing of the spermatic cord. This mistake will result in a “staggy” appearing steer with characteristics that look like a bull.

Banding (elastration) is the final method of castration. With this method, a strong rubber band is placed between the scrotum and body cavity. As with emasculation, the blood supply to the testicles is disrupted and the testicles atrophy. It is critical to make sure both testicles are below the band or else the testicular hormones will continue their work and your steer will look and act like a bull. Giving your calf an injection of tetanus toxoid after banding to prevent a tetanus infection is important. Banding is the least desirable method of castration because the bands often break or are placed improperly above the testicles. These errors can result in serious infections or incomplete castration.





All of the training required to show your calf correctly should be done at home before the roundup. Most of it should be done in the first two months you have your calf. When you first bring your calf home, spend time in the pen each day to allow it to get used to you. Calves may approach you out of curiosity. Move slowly to avoid frightening them. Allow calves to sniff your hands and body. You soon will gain their confidence and trust. With time, your calf will come to see you as simply another part of their pen—and the provider of feed!

Soon after you get your calf home, you should begin halter breaking it. Begin by placing a halter on your calf with the lead end of the rope going under the calf's chin and exiting from the left side. You may need an adult to help you get a rope on

your calf. Having somewhere to confine your calf during this process helps. Some people let the calves drag the rope for a few days to get used to it before tying them up. At some point you should begin to tie the calf to a wall or solid fence for a few hours. See Appendix A for information on how to tie a quick-release knot. The first few times you tie your calf, tie it knee high with no more than a foot of rope between the calf's chin and the wall or fence. Spend time with the calf while it is tied. Do not leave a calf that is not halter broken unattended. Brush, pet, and talk to it. Let the calf know you're not going to hurt it. Most calves will stop fighting the rope after a few of these sessions, but the calf should be tied every day or it will forget what it has learned. If the rope begins to irritate the calf's chin, reposition the rope to a new location under the chin.

After the calf is used to being tied, start training it to lead. Start by trying to lead it to water after it has finished eating. Some calves will not want to go. Having someone behind a stubborn calf to help get it moving sometimes helps. Other calves may not want to stop. Having a second person on the halter with you to help slow the playful ones down may help this. Either way, halter breaking is good exercise and should be completed within two months after you bring your calf home.

IMPLANTS

Commercial cattle feeders often use ear implants to improve growth rate and feed efficiency in finishing cattle. Implants are small pellets inserted under the skin in the backside of the ear. These pellets slowly release naturally occurring hormones into the bloodstream of implanted cattle that allow them to use feed more efficiently. Since the hormones used in implants are similar to those that are naturally found in cattle, they do not affect the safety of the beef produced by an implanted animal. However, some evidence has been found indicating that steers implanted within 100 days of slaughter have less marbling in the muscle than steers that do not receive ear implants, which

could lead to a lower-quality grade. Also, although implants are completely safe, some consumers fear eating beef from implanted animals.

If you choose to use ear implants, they must be reinserted at specified intervals during the finishing period—usually every 60 to 90 days. If you have never implanted a steer before, have your leader or extension educator show you how.

Words You Should Know

Budget: An estimation of the profitability of raising market steers.

Conformation: A general term describing the way the external parts of a steer are put together.

Fed cattle: Finished steers or heifers ready for slaughter.

Feeding period: The time from when you buy your steer until the show; generally 180 to 250 days.

Free choice: Available for consumption at all times.

Finished: Market weight cattle with at least 0.4 inches of backfat.

Intramuscular fat: Small amounts of fat deposited within the muscle tissue.

Marbling: Intramuscular fat used to determine quality grade.

Quality grade: A grade assigned based on the amount of marbling and age used to predict how juicy and flavorful the meat from a carcass will be.

Shrink: Weight lost during trucking.

Sound: Free from structural defects.

Yield grade: A measure of how lean and heavily muscled a carcass is.

Suggested Activities

- Label the parts of a steer on a diagram or point them out on a live steer.
- Have members of your club answer roll call at a meeting with the name of a market steer part.
- Participate in a beef cattle judging practice session, workshop, or contest.
- Select a feeder calf using your knowledge of parts and desirable type.



- Visit a fair or show and listen to the dairy, beef, or dairy beef judge give reasons for placing the calves the way he or she did. Note differences in reasons between dairy females and beef animals.
- Visit a feeder steer auction to learn how steers are bought and sold.
- Visit a dairy farm and look at differences in type and confirmation of dairy calves.

Extra Activities to Try

- Visit a feeder steer sale.
- Look up the local market price of steers each week in a farm newspaper or other source of price information. Make a graph of feeder calf prices each week.
- Check feed prices with a local feed supplier.

Ideas for Presentations and Talks

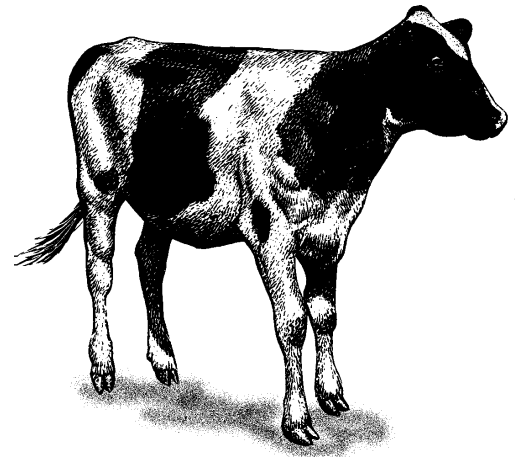
- Identifying the parts of steers
- What to look for when selecting feeder steers
- Costs of buying and raising a steer
- The difference between yield and quality grade

Things to Talk About

- What are the main parts of a steer's body?
- What factors should you look for when choosing calves for dairy beef feeder projects?
- Why are dairy feeder calves worth less per pound than beef feeder calves?



Caring for Your Dairy Feeder Calf



Taking proper care of your project steer will be a great learning experience for you. Your calf has many needs in order to live comfortably. To grow and produce efficiently, calves need clean, comfortable housing, fresh air, clean water, and a good supply of feed.

Objectives

After studying the materials and completing the suggested activities for this section of your project, you should be able to:

1. Outline the basics of steer care, including proper bedding and living conditions.
2. Give a parent or project leader a tour of the place here you keep your calf and point out what you are doing to take care of it.
3. Calculate the amount of feed required to raise a dairy beef feeder calf.

Housing Needs

Do not buy a dairy calf until you have a good place to keep it. People are not allowed to keep farm animals in some areas, so find out local regulations for where you want to keep your calf. Also find out if there are special laws or rules you must follow to care for your calf.

Make sure you have the right kind of facilities and equipment to house and care for your calf. Cattle do not need fancy or expensive facilities to do well. Most 4-H'ers raise their calves in a pen or dry lot. Baby calves started in late winter should be provided with a sheltered, well-bedded, indi-

vidual stall. Calves can be combined and fed as a group after weaning.

After weaning, calves need space to lie down, move around, and eat. Provide at least 100 square feet of barn or pen space for each calf to be housed in a shelter or pen. Exercise lots or dry lots should contain at least 200 square feet for each calf.

When calves breathe smelly, stale air, they may get sick or grow slower than normal. Provide a good source of fresh air (ventilation), but provide a place for your calf to get out of the wind and drafts.

Dairy calves do not grow very well when they are too hot or too cold. Baby calves up to one month of age are most comfortable around 70°F. Older calves are most comfortable and grow best when the temperature is between 45 and 60°F. Cattle have very thick hides and are able to tolerate cold weather better than pigs, for instance. In extremely cold weather, calves will use a greater percentage of their feed to keep warm instead of growing. Provide straw or other bedding so your calf can lie in it and keep warm. However, be careful not to overconfine your calf. Overconfinement and a lack of fresh air are major causes of respiratory disease and a potential source of scours.

During hot weather, calves will breathe rapidly if they are too hot. When calves are too warm, they will grow slowly because they do not eat enough feed. Provide shade to keep your calf comfortable in the summer. Exposing your calf to long periods of sun in the summer could

cause sunstroke. A good cheap source of shade for calves kept outdoors is a frame of poles covered with straw, cornstalks, or plastic feed bags. Trees will give shade, too. During hot summer months, keeping your calf in a well-ventilated shed during the day (use a fan if necessary) and turning it loose in a dry lot (with little or no grass) at night is best.

Keeping Your Calf Clean

Keep your calf's pen clean to reduce the chance of disease caused by filthy conditions and contaminated feed and water. If confined to a small pen that is not cleaned regularly, cattle will accumulate manure in their hair coat, particularly on their rear legs. Bedding such as straw will help keep manure from accumulating. If your calf has manure attached to its hair, your pen is not being cleaned often enough or you aren't using enough bedding. Also, stains caused by manure are difficult to remove from white cattle at roundup time.

Cattle manure contains nitrogen, phosphorus, and potassium. All three of these nutrients are necessary to make plants grow. If you have a garden, you can use the manure your calf produces instead of buying commercial fertilizer. Large-scale cattle feeders are required to have a certified plan indicating where their manure will be spread so that the nutrients in the manure match the nutrient needs of plants. Some places have laws controlling what to do with manure, so find out if there are special rules you must follow where you keep your calf.



How Cattle Digest Food

Perhaps you have heard that cows and sheep have four stomachs. Actually, they have a stomach with four compartments. The first compartment is called the reticulum and is partially connected to the rumen. The animal might accidentally eat hardware, such as nails or wire, which settles in the reticulum. The second compartment is called the rumen. Here, tiny bacteria break down forages like grass and hay. This gives cows and sheep the ability to eat and digest forages. This is why we call cows and sheep "ruminants." The third compartment is the omasum, where a large amount of water is absorbed. The fourth compartment, called the abomasum, is somewhat like the stomach of nonruminants. However, all four parts of the stomach are not fully developed when a baby calf is born.

Feeding Your Calf from One to Seven Weeks of Age

Feeding a very young calf is a challenging task. When you buy your calf, its digestive system is prepared to digest only milk. By the time you sell it, your calf will be a full-fledged ruminant prepared to digest forages and grain. Your job is to help your calf's digestive system make this change.

The first meal your calf eats is probably the most important meal of its life. Colostrum (first milk) from the calf's mother is packed with nutrients and substances that help your calf fight diseases that it will encounter early in life. Colostrum must be ingested within the first 24 hours of life to help fight diseases. If possible, before you buy a calf, make sure it had plenty of colostrum within 24 hours of birth.

A young calf is not as capable of digesting hay and grain as a mature cow. In fact, a special groove called the esophageal groove channels liquids (milk) past the undeveloped rumen directly to the abomasum (the true stomach, much like yours), where it begins the digestion process. The rumen (fermentation vat portion of a cow's stomach) begins to develop when a calf begins to consume



solid feed. The rumen is not fully developed until some time later in the calf's life.

Therefore, calves should be fed whole milk or high-quality milk replacer for the first month or two of life. Purchased milk replacers are not created equally. You should use a milk replacer that is at least 20 percent protein and 15 percent fat until the calf is four weeks of age. Some milk replacers are medicated. If you choose to use a medicated milk replacer, make sure you read the tag carefully and follow any listed withdrawal period. Medicated milk replacers may contain antibiotics or coccidiostats. Many milk replacers contain other compounds such as oligosaccharides to help reduce scours, but these are natural compounds that do not require a withdrawal period.

Milk replacer may be fed through a bottle or nipple bucket for the first few days of life, but most calves can be quickly taught to drink from

a bucket. One method of bucket breaking a calf is to allow the calf to begin sucking on your fingers, then lower your hand into the bucket of milk replacer. Milk or milk replacer should be fed twice daily and mixed according to label directions. Limit each milk replacer feeding to 8 to 10 ounces of powder mixed with 2 quarts of water. Limiting the use of milk replacer helps prevent scours and stimulates the calf to begin eating solid feed.

Make sure your milk-feeding equipment is thoroughly cleaned after each feeding. Dirty feeding equipment can introduce bacteria into your calf's digestive system and can lead to scours. Calves should have fresh, clean water available at all times—even when they are consuming milk replacer.

Grain feeding should begin when calves are a few days of age. Begin by offering your calf a very small amount of 18 percent protein grain mix

each day. The grain should contain molasses as a sweetener to induce the calf to investigate the new feed. Any grain not consumed each day should be discarded and replaced with fresh feed.

Your calf should be weaned from milk replacer at six weeks of age. By that time it should be consuming at least 1.5 pounds of grain each day. Milk replacer can be diluted for the final week until the calf is getting all the liquid it needs from water. Hay can be introduced to calves after weaning.

During the period from one to seven weeks of age, your calf should gain about 1 pound each day.

Feeding Your Calf from Seven Weeks of Age until the Roundup

At seven weeks of age, your calf's digestive system is developed fully enough to begin digesting larger amounts of high-quality grain mix. Feeding strategy from seven weeks of age until the roundup is a matter of some debate; however, dairy feeder calves should not be fed the same as dairy replacement heifers. Remember that these calves are destined for beef production and that most dairy breeds are large framed. Unless large-framed beef animals are fed properly when young, they will likely be beyond acceptable market weight when finished. In fact, research has shown that dairy calves fed corn silage from 125 to 600 pounds were much less likely to reach the choice quality grade when slaughtered at 1,150 pounds than calves fed corn (41 percent versus 75 percent choice). The key to finishing dairy steers is to start feeding a lot of grain when calves are young and continue feeding a lot of grain during the growing and finishing periods.

When your calf is completely weaned from milk replacer and eating hay and grain at six to seven weeks of age, slowly begin increasing the amount of grain offered. Calves more than seven weeks of age should consume about 2 percent of their body weight in grain each day. Increases in grain offered should be made slowly. Do not increase the grain offered by more than 2 pounds

per week. The table below indicates the amount of grain that should be consumed daily by calves of various weights. Your calf may eat more.

<i>Weight (pounds)</i>	<i>Pounds of grain</i>
200	4
300	6
400	8
500	10
600	12

Along with their grain mix, calves must have a small amount of hay to help the rumen develop and keep functioning. Free choice, high-quality hay should be offered at all times. Calves should consume about 2 to 4 pounds of hay per head each day during the growing period.

Feed, hay, and water can be provided by self-feeders and automatic waterers or you can use feed pans or tubs to feed grain and a deep tub or bucket in the corner of the pen for water. Grain also can be fed from a tray mounted on the side of the pen. Provide about 20 to 24 inches of feeder space per calf. Keeping feed and water above floor level helps keep steers from soiling their eating and drinking spaces. Leftover, stale, or soiled feed should be removed before each feeding.

Nutrients

Nutrients found in feed help animals to stay alive and grow. The six classes of nutrients found in feeds include water, carbohydrates, fats, proteins, minerals, and vitamins.

Cattle use water to carry nutrients to places in the body where they are needed, remove waste products, and help keep the body cool. Be sure to provide your steer with plenty of clean, fresh water. Each calf may drink about 1 to 10 gallons daily depending on the calf's weight, outside temperature, and type of feed. Change the water in watering pans or buckets at least once each day.

The rest of the nutrients needed by growing cattle are found in solid feeds. Along with grain, remember that some forage or hay must be in-

cluded in the diet for a steer's digestive system to work correctly.

Carbohydrates like sugars, starches, and cellulose provide the largest amount of energy in cattle feeds. Energy is used for body functions such as breathing, walking, or growing frame and muscle. Extra energy consumed from feed is deposited as fat. Grains such as corn are the best sources of carbohydrates and provide the largest amounts of energy. Forages contain different kinds of carbohydrates that contain less energy than grains.

Fats are concentrated energy sources. Some fat is usually present in hay and grain. Fat is sometimes added to commercial feedlot rations to increase the energy level and, thus, the growth rate of steers. For your project calf, however, you probably will not be feeding any fat besides what is naturally present in its regular feed.

Protein is used to make and repair muscle. Soybean meal, canola meal, and legume forages (such as alfalfa and clover) are good sources of protein. Corn is a relatively poor source of protein.

Vitamins and minerals are two other categories of nutrients commonly added to calf diets. Minerals such as calcium and phosphorus are important for bone development. Other minerals help many of the body processes work correctly. Some of the minerals calves need are found in

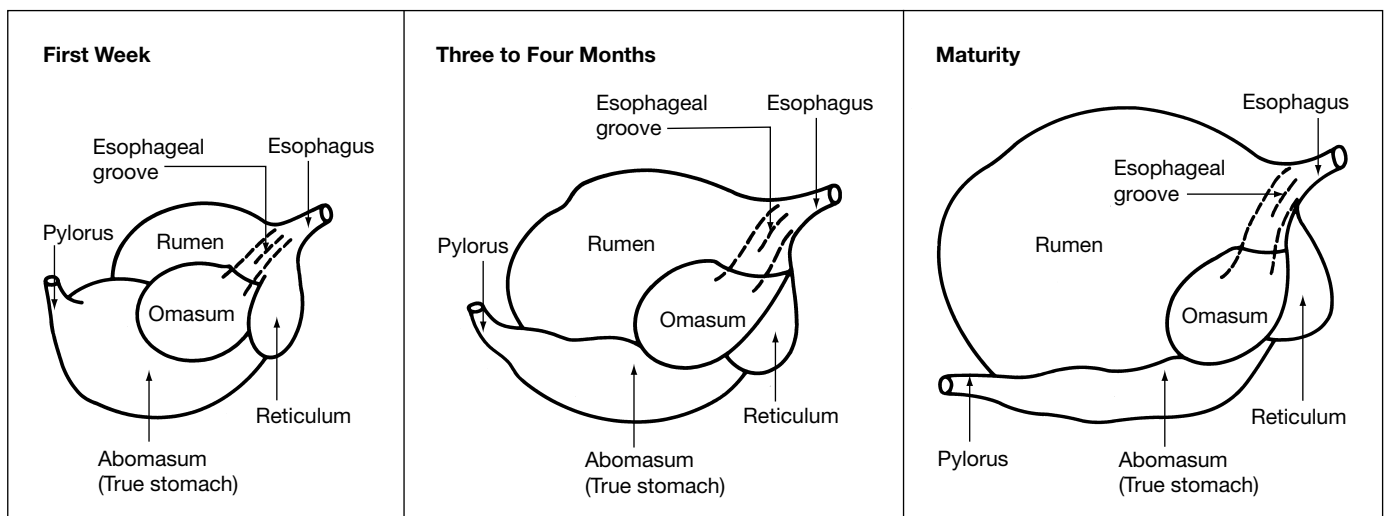
the forages and grains they eat, but others must be added to the diet in a mineral mix. Vitamins are needed in very small amounts to assist in many body functions. Some vitamins are found in feed—often in forages—but additional vitamins are usually added to the feed.

Some ingredients commonly used in calf feeds are high-quality grass hay, high-quality legume (alfalfa or clover) hay, oats, ear corn, shelled corn, soybean meal, macrominerals (such as calcium and phosphorus), distillers grains, molasses, trace mineral salt, and vitamins. The grain, vitamins, and minerals are usually ground and mixed together so that the nutrients needed by the cattle are eaten in the right amounts. Hay can be ground and mixed with the grain, but providing baled hay to your calf in order to keep its digestive system functioning properly is usually best. Grain mixes should be coarsely ground or kept whole.

If you follow directions carefully, the feed can contain an ionophore. Lasalocid (Bovatec®) or monensin (Rumensin®) are feed additives that will help your calf grow faster and more efficiently. They also will prevent bloat and control coccidiosis caused by coccidia.

You may purchase commercial calf feed or make your own. Ask your leader for help if you are not sure what to feed.

Development of bovine stomach compartments from birth to maturity.



Make sure your calf does not have access to poisonous plants or shrubs. Some plants such as nightshade and yew are toxic to cattle. Dead wild cherry leaves are also toxic to cattle. If wild cherry trees are in or near your steer's lot, be sure to remove fallen branches promptly. Make sure your calf is kept away from any potentially dangerous plants. Ask your extension educator for more information on poisonous plants.

How Much Feed Will Your Calf Eat?

Steers' eating habits are like those of people. Some eat a lot while others do not. Also, the bigger steers are, the more they eat. A 100-pound calf may be able to eat only 2 pounds of feed (hay and grain combined) per day in addition to the nutrients supplied by the milk replacer. A 500-pound calf may gobble 12 to 14 pounds of hay and grain each day.

One way to figure out how much your steer should eat each day is to multiple its weight by 2.2 percent (0.022). This will tell you the pounds of dry matter (not including moisture in the feed) your steer can be expected to consume each day. Hay and grain mixes are usually about 90 percent dry matter, so to figure out how much feed your steer will eat as fed, divide this amount by 0.90. For example, a 500-pound steer would be expected to eat 11 pounds of dry matter (500×0.022). Converted to an as-fed basis, your steer will eat about 12.2 pounds of feed ($11 \text{ pounds} / 0.90$). Generally, steers should be fed no more than 85 percent grain in the diet, so our 500-pound steer should eat no more than 10.4 pounds of grain per day (12.2×0.85).

You need to be able to calculate the total amount of feed each steer will eat between the time you buy it until the time you sell it. This calculation is simple. First, you need to know the amount of weight you expect your steer to gain. This will depend on your steer's starting weight and how many days from purchase to show day. Let's say for this example your steer needs to gain 500 pounds. A dairy feeder calf will average about



7.5 pounds of feed for every pound of weight it gains. So, if your steer needs to gain 500 pounds, multiply 500 by 7.5 to arrive at the total amount of feed your steer will eat while you own it. In this instance, the steer will eat 3,750 pounds of feed. If your steer is on a high-energy diet for the entire feeding period (85 percent grain), then 85 percent or about 3,200 pounds of the feed it eats will be grain. The remaining 550 pounds will be hay.

To calculate how much milk replacer your calf will consume, use 1 to 1.25 pounds per head per day as an average.

Monitoring Your Calf's Progress

You should also monitor your calf's rate of weight gain with a weight tape or scales at monthly intervals during the entire feeding period to make sure your steer is growing fast enough. Slow growth may be caused by a variety of factors including poor nutrition, disease, parasites, or lack of clean water. Your calf should exhibit a healthy hair coat and begin to deposit enough fat so that the ribs cannot be seen. A healthy dairy beef calf should have more flesh than a developing dairy replacement heifer.

Exercise

Daily exercise helps keep people healthy and builds muscle and does the same for steer. You should exercise your steer frequently to help it develop muscle volume and tone. Some 4-H'ers walk their steers a mile or two each day beginning in the springtime when the weather breaks. Walk your steer in the morning or evening during hot summer days to prevent it from overheating.

Words You Should Know

Abomasum: Part of a ruminant's stomach that is most like a human stomach.

As fed: Feed weight including water.

Bovatec®/Rumensin®: Feed additives that make ruminates use feed more efficiently.

Dry matter: Dry feed not including water (is always less than "as fed").

Omasum: Part of a ruminant's stomach that absorbs water.

Reticulum: Part of a ruminant's stomach that sorts out any foreign matter that is eaten.

Rumen: Part of a ruminant's stomach that acts as a fermentation vat—home to billions of bacteria.

Ruminant: Animal that can digest forages.

Suggested Activities

- Visit a beef feedlot and learn about the feeding and watering system. Also observe how the owner keeps the steers comfortable.
- Plot on a graph how much feed your steer is eating each day.
- Lead your parent or project leader on a tour of the place where you keep your steer. Point out the things you are doing to make your calf comfortable. Show that each of the following are taken care of:

- _____ Is there plenty of feed?
- _____ Is the steer being fed properly?
- _____ Is the water plentiful and clean?
- _____ Is the steer comfortable?
- _____ Is the pen clean?
- _____ Is there enough fresh air?
- _____ Is it too cold or too hot?

_____ What did the feed cost?

_____ Are records being kept?

Extra Activities to Try

- Collect samples of ingredients typically used in beef cattle rations so you can learn to identify them. Discuss with your leader or parent what each ingredient contributes to the ration.
- Look at a tag from a commercial steer feed. Name the main ingredients and tell how much protein is in the feed.
- Compare tags from different types of milk replacers. Which ingredients seem to affect the price?

Ideas for Presentations and Speeches

- How you take care of your steer
- Your steer's basic needs
- Beef facilities and equipment
- Beef identification systems

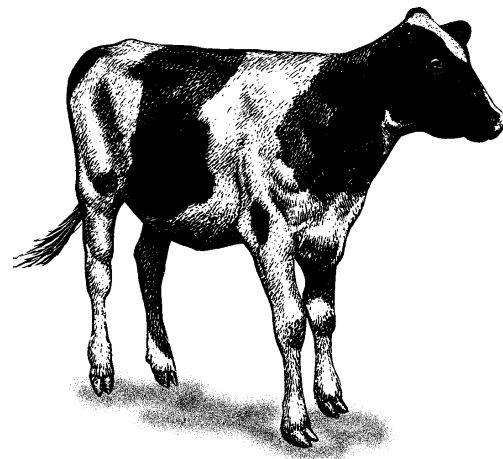
Things to Talk About

- What do you need to do to take care of your steer?
- How do you know if your steer is too cold or too warm?
- Why should you keep records of the feed your steer eats?
- Why should dairy beef steers be fed differently than dairy heifers?



7

Observing Calf Behavior



Steers can show you whether they are sick or healthy by the way they act, the sounds they make, and by the consistency of their manure. Learn to watch and listen to your steer because it can show you when it is okay and when it needs you to do something for it.

Steers that are under stress or excited can hurt people or themselves. If you understand how steers normally behave and what they like and dislike, they will be easier to handle and you will be less likely to get hurt working with them.

Objectives

After studying the materials and completing the suggested activities for this section of your project, you should be able to:

1. Describe the normal behavior of a steer.
2. Recognize whether your steer is behaving normally when you watch and listen to it.
3. Compare normal behavior of beef cattle with behavior of other animals.

How Calves Behave

One of the most interesting things about calves is the way they act. They can be very funny to watch. Unlike people, steers tend to be awake and active during all hours of the day and night. They only “sleep” a couple of times each day and then only for a few minutes at a time. Sleeping cattle will turn their heads and lay them alongside their bodies. Pigs, on the other hand, tend to sleep at night and be active during the day like people.

One of the most common behaviors you will notice from your calf after it begins eating forage is the process of “ruminating” or “cud chewing.” When cattle eat forages such as grass and hay, they swallow large pieces. Later, while they are resting, the large pieces come back up into the animal’s mouth for chewing. This is called regurgitation. If you watch closely, you will be able to see your steer regurgitate a “bolus.” It will then chew this bolus for a while before swallowing it again.

Steers normally make a “bawling” sound to call other cattle if they are lonely—or to let you know it’s thirsty or hungry! The other sound you might hear from your steer is a cough. Cattle that cough may be sick or could have worms.

Steers usually walk when they move around their pens. If they run or jump, they are feeling energetic and happy. When older calves feel good and have access to loose dirt, they may paw at the ground.

Different calves have different temperaments. Some are curious and approach people out of curiosity. These cattle are normally the easiest to tame and halter break. Other cattle, because of genetics or a previous experience with people, are skittish, run from people, and are easily frightened.

Cattle will normally lie on their stomachs with their legs curled underneath them. Sometimes they may sleep for a few minutes on their sides with their legs straight out.

Some calves get excited very easily. People

who understand normal cattle behavior can build equipment and facilities that keep them calm and make them easier to move and handle. For example, loading chutes should have solid sides so cattle will not see things on the outside of the chute that could scare them. Cattle move easily around curved passages, but getting them to make sharp turns is often difficult. Cattle prefer to move toward light and away from darkness. They do not like to move toward moving objects and loud noises. Calves do not like to step over obstacles like a garden hose or door frame. They are suspicious and frightened of shadows in aisles and walkways.

Learn to recognize normal and abnormal urine and feces (manure) from your calf. Urine and feces may look or smell different when steers are sick. The urine from normal steers is clear and yellow. Steers' feces will look different depending on their diets. Calves eating milk replacer will have yellowish or whitish feces. Steers on a high-energy diet will have soft, brown feces with bits of grain visible in them. If your steer has loose, watery, or bloody feces without bits of grain apparent, show your parent or leader. Cattle on high-forage diets often have firmer feces. If you notice that your steer's urine or feces does not look right, ask your parent or leader to take a look.

Also learn to recognize general signs that your steer is not feeling well by observing its behavior.



Cattle that are sluggish, lack energy, or don't eat may have health problems. See Section 8 for more information on signs of sick steers.

Words You Should Know

Bolus: Name for the forage that is regurgitated for rumination; also called "cud."

Ethology: The study of animal behavior.

Regurgitation: Process of bringing a bolus of previously consumed forage back to the mouth for chewing.

Ruminating: Process of chewing previously eaten forages.

Suggested Activities

- Spend time observing steers as they eat and sleep. Point out the different behavior you see to your parent or leader.
- Attend a beef cattle show and observe the behavior of the animals.
- Observe other farm animals or house pets and compare their actions to steers' actions.
- Compare behavior of cattle on pasture without frequent human interaction with the behavior of dairy cattle that are handled multiple times each day.

Ideas for Presentations and Speeches

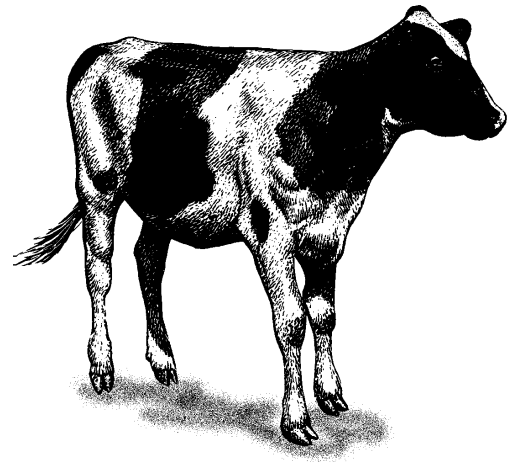
- Why cattle ruminate
- How to tell if your steer is acting normally

Things to Talk About

- How does a steer usually act during a typical day?
- What sounds do steers make and what do these sounds mean?
- What should you do if you think your steer sounds or acts like something is wrong?



Keeping Calves Healthy



The success of any livestock operation depends on the health of the animals. Healthy, well-managed cattle will grow and produce efficiently. Disease can be costly because of the medical expense for treatment and lost weight gain.

Objectives

After studying the materials and completing the suggested activities for this section of your project, you should be able to:

1. Show and tell how to use a veterinary thermometer.
2. Name the three main things that make steers sick.
3. List four or more symptoms of a sick steer.

In addition to their four-part stomach, steers have a small intestine, a large intestine, and a liver to help digest their food. Their hearts pump blood to all parts of their body and, like people, steers breathe with their lungs. These internal parts of a steer's body are very important. They all must work properly in order for the steer to be healthy. If your steer is not healthy, the organs and body systems will not function properly and your steer will not grow.

What Makes Calves Sick?

A healthy calf will eat when it is offered grain, either once or twice a day. If your steer is not eating or drinking, it may be sick. Knowing a steer's normal body temperature is important because

the body temperature goes up if the steer gets sick. A high temperature is a sure sign that your steer is not feeling well. The normal body temperature for people is 98.6°F. The normal body temperature for steers is 101.5°F. However, if a steer's temperature is between 100.5°F and 103.0°F, it is normal. Temperatures over 104.0°F indicate a sick calf. If you call a veterinarian when your steer acts sick, he or she may ask for your calf's temperature.

You should learn to use a livestock thermometer to take your calf's temperature. Use one that has a loop on the end. Tie a string through the loop so the thermometer will not disappear inside the steer. Put a clip on the other end of the string so you can clip the string to the hair on the steer's rump. To take the calf's temperature, place the thermometer into the steer's rectum and leave it there for about three minutes before taking it out and reading it.

Steers can get sick in three main ways. First, steers get diarrhea. This affects the digestive system. Runny feces with a strong smell are characteristics of diarrhea. It is very important to realize that the organisms that cause loose manure are contained in the diarrhea, so keeping the pen clean is necessary. Dirty pens and equipment, contaminated water, dirty feed troughs, and sick animals themselves can spread bacteria and germs that cause disease.

Diarrhea in baby calves is called scours. Watery feces can cause baby calves to dehydrate quickly. Dehydrated calves can die if not properly

treated. If your calf develops scours, contact a veterinarian immediately and discuss treatment options.

Coccidiosis sometimes causes steers to get diarrhea. Coccidia are actually tiny parasites found in the intestines of infected cattle. Steers can be fed coccidiostats (such as Rumensin® or Bovatec®) to prevent coccidiosis.

Steers with diarrhea can dehydrate very quickly. If you notice that your steer has diarrhea, get help from an adult and try to remember when the diarrhea started.

The second kind of major health problem is respiratory diseases, or those related to the steer's breathing. This problem affects the lungs, throat, and nose. The easiest way to know if your steer has such problems is by hearing it cough or have trouble breathing. You may also notice mucous hanging from the nose of your calf. Stress caused

by trucking steers, poor ventilation, or changeable weather can all trigger respiratory disease. Germs that cause respiratory diseases can be carried through the air or picked up through nose-to-nose contact. For any health problem, but especially for respiratory disease, acting quickly and beginning a treatment program is important. Again, if you see any of these problems, ask your parent or leader for help.

To help prevent respiratory disease, your steer should be vaccinated for IBR, BVD, PI3, BRSV, H. Somnus, and pasturella after two weeks of age. A booster shot should be administered 21 days later. See Appendix B for more information about respiratory diseases.

Another health problem for steers is internal and external parasites. Parasites affect the digestive system or the skin. Worms are the main kinds of internal parasites. There are many dif-



ferent types of worms, many of which come in different shapes and sizes. Some are only visible with a microscope, while others are large and look like spaghetti. Although worms rarely kill calves, they can severely reduce a calf's growth rate and cause it to lose body condition or have a rough hair coat. Worms consume feed nutrients that steers need to grow. Sometimes you may not know that your steer has internal parasites. Talk to your veterinarian or leader about a routine worming program for your market steer. You should plan to worm your steer at weaning and again at 5 months of age.

Another internal parasite is commonly known as cattle grubs or warbles. These are the larvae of the heel fly that develop under the hide, causing a raised lump (usually on the back). The larvae eventually hatch out and fall to the ground to complete their life cycle. The best treatment for cattle grubs is good prevention with internal paratocides such as ivermectin (Ivomec®) or Dectomax®, administered in early fall. Neither of these products should be given to cattle during the winter months. Grubs are best treated before they are big enough to be noticed under the hide.

Lice and ticks are the two kinds of external parasites that can affect calves. The main thing these parasites do is drink the steer's blood, which can make the steer weak. If you notice hair loss on your steer's neck and twist or see your steer rubbing itself on a gate or post, it could be a sign that your steer has external parasites. Several treatments are available for ticks and lice. Ask your parent or leader for help if you spot either of these pests.

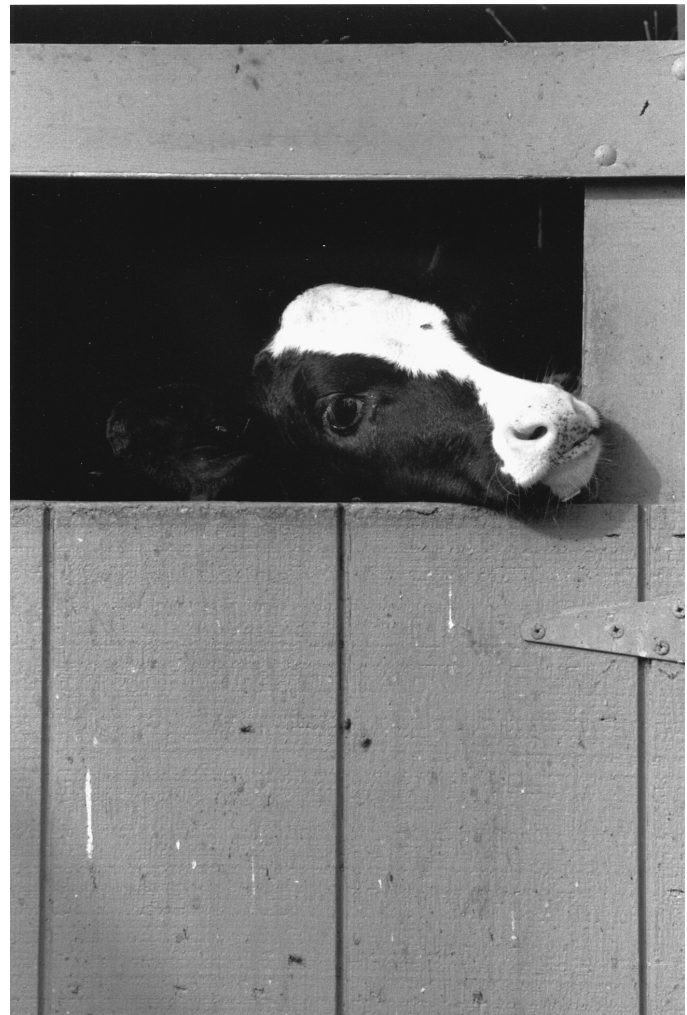
Foot rot is a disease caused by bacteria invading the soft tissue of the hoof, causing tissue decay and a foul odor. Steers usually develop a limp and swelling above the hoof. Foot rot can be treated with antibiotics as recommended by a veterinarian. Overgrown hooves also can cause steers to limp.

Ringworm is a fungus that sometimes infects cattle that are housed indoors in the wintertime.

Abundant sunshine is the best prevention. If your calf gets ringworm, you will notice hair loss in circular patches anywhere on the body. Detecting and treating ringworm early is important. Ringworm can be cured by routine fungicide treatments. Always use gloves to treat ringworm because it is contagious to humans. If you think your steer has ringworm, consult your leader or veterinarian for appropriate treatments.

Warts routinely affect cattle. Cattle can be vaccinated for the virus that causes warts if they are a serious problem. When warts appear, they can be easily removed with a sharp knife or sometimes even pulled off with your hands.

Pinkeye is a bacterial infection of the eyeball, usually caused by some irritation such as face flies. Cattle with pinkeye have watery eyes and



have difficulty keeping their eyes open. Pinkeye can be treated by applying antibiotic powder directly to the affected eye or by using an injectable antibiotic and placing the calf in a shady, clean area. A vaccine for pinkeye is available. If left untreated, pinkeye can cause your steer to go blind. If you think your steer has pinkeye, let your parent or leader know.

In addition to the health problems listed above, understanding that steers can get many other diseases is important. Such diseases may be contagious and passed from steer to steer and from herd to herd; therefore, to maintain “biosecurity” (a disease-free environment), doing the following is suggested:

- Isolate new animals for at least 14 days after bringing them home.
- Place a foot bath with disinfectant at the entrance to your barn or wear disposable boots.
- Avoid wearing the same clothes from farm to farm.

Keeping the steer and the pen clean is the most important step in maintaining your steer’s health. Also, make sure the steer is well fed, comfortable, and eating and drinking normally. Get help from an adult if you think your steer is sick.

Words You Should Know

Biosecurity: Practices to keep your steer from catching diseases from other steers, people, or the environment.

External parasites: Parasites that cause problems on the outside of the steer, such as lice and mange.

Internal parasites: Parasites that cause problems on the inside of the steer, such as worms.

Parasite: A living being that lives and gets its food in or on another living being called a host.

Ruminant: An animal such as a steer that has a stomach with multiple compartments, allowing it to digest forages.

Suggested Activities

- Name the three main things that cause steers to get sick.
- Describe at least four signs to look for to recognize a sick steer.
- Show or tell the proper way to use a livestock thermometer to measure a steer’s temperature.
- Create health record sheet to track things you do to your calf.
- Find out what veterinary examinations and documents are needed to show a calf at your local roundup or county show.

Extra Activities to Try

- Observe your steer’s behavior to see if it is eating, drinking, and breathing properly.
- Observe your steer’s urine and feces to see if it looks normal.
- Have your parent or project leader check to see if the ventilation in your steer’s pen is acceptable.
- Check your steer for ringworm and warts.
- Visit a local veterinarian. Ask to see internal parasites under a microscope.
- Travel with a veterinarian and watch him or her examine a sick calf.
- Deworm your steer using an approved product.
- Design a health plan for your project calf.

Ideas for Presentations and Speeches

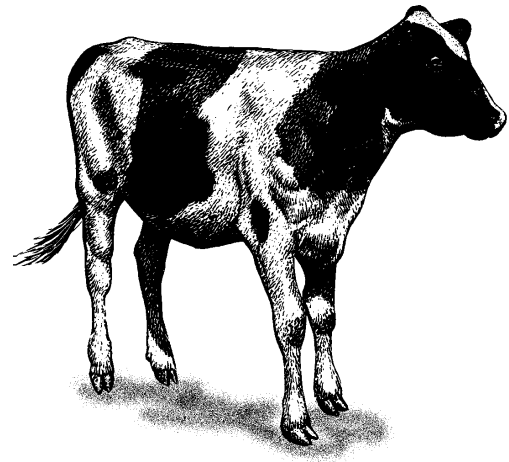
- The normal steer
- Health problems that steers can have
- How to keep your steer healthy and happy
- Parasites and how to control them
- Biosecurity practices

Things to Talk About

- What steps should you take to keep your steer healthy?
- What should you do if your steer gets sick?
- What are the three main health problems calves can have?



Quality Assurance and Ethics



Because you have a 4-H dairy beef project, you are a food producer. All beef producers are linked to the human food chain because they produce meat for people to eat. Therefore, you are responsible for ensuring that the calf you produce is a wholesome and safe food.

Objectives

After studying the materials and completing the suggested activities for this section of your project, you should be able to:

1. List good production practices to ensure quality.
2. List two things consumers evaluate before buying fresh beef.
3. Name four broad principles of livestock ethics.

Good Production Practices for Quality Assurance

You and all other parties that contribute to beef production—including dairy, veal, cow-calf producers, and cattle feeders—must realize your role in producing safe, wholesome beef. It takes only one mistake to shake consumer confidence in the safety of beef and beef products.

Even though your calf is not going directly to slaughter, the buyer of your calf, as well as consumers, expect you to use quality-assurance principles. The following are approved good practices that must be observed to ensure wholesome, safe carcasses:

1. Identify and track all treated animals.

Make sure your calf has an ear tag or is permanently identified in some way. Records of treatments must contain this identification.

2. Maintain medication and treatment records.

Record any injections given, including which steer it was given to, the date, the drug, the amount, where the steer was injected, and who gave the medication. A medication chart can be found in Appendix C. Keep records for at least 12 months after the animal is sold. If you feed medicated feed, write down what medication was fed, the level of medication in the feed, and the dates when you started and stopped feeding it. Because of consumer concerns about antibiotic residues, the National Cattlemen's Beef Association (NCBA) recommends that antibiotics not be fed simply to increase rate of weight gain.

3. Properly store, label, and account for all drug products and medicated feeds.

Information and storage instructions can be found on the label of all medications and medicated feeds. Make sure you understand the label directions and use products only as prescribed on the label. Make sure injectable products are stored at the correct temperature and have not passed their expiration dates. Place used needles in a "sharps" container.

4. Obtain and only use veterinarian prescription drugs based on a valid Veterinarian/Client/Patient Relationship (VCPR).

Injectable antibiotics should only be used when a steer is sick, and then only under the supervision of a veterinarian.

If the veterinarian prescribes an antibiotic to be used differently than for which it is labeled, the veterinarian should also supply a withdrawal period for the medication.

5. Use proper administration technique and withdrawal times. If you must treat a sick steer, ask your veterinarian what withdrawal times must be observed or strictly follow the directions listed on the label. All intramuscular (in the muscle) injections should be given in the neck muscle in the area in front of the shoulder. Subcutaneous (under the skin) injections can be given in the same place and are preferred if you have a choice between intermuscular and subcutaneous. **Never** give a steer a shot anywhere other than the neck muscle.

Some antibiotics require a withdrawal time. Withdrawal time is the minimum time you must allow to pass between when the antibiotic is given to the steer and when the steer goes to slaughter. This time period allows the antibiotic to clear out of the steer's system. Some antibiotics can be used safely until the steer is marketed; others must be discontinued for a period of days or weeks before marketing. Make sure you observe the proper withdrawal times for any antibiotics given to your steer. If an antibiotic has a withdrawal time, it will be listed on the label. If you use medicated feed (feeds containing antibiotics), the withdrawal times are printed on the feed tag.

6. Use drug residue tests when appropriate. If you do not know if your animal contains anti-



biotic residues, ask your veterinarian about live animal drug residue tests.

7. Establish an efficient and effective herd health management plan. Do everything you can to prevent your calf from getting sick. Purchase animals from individuals rather than sale facilities, make sure your animal's environment is comfortable, vaccinate as recommended, and practice good biosecurity to keep your animal from getting sick.

8. Provide proper animal care. Make sure your calf has fresh, high-quality feed and clean water daily. Pens should be kept clean and in good repair. The way you physically treat live steers can also affect beef quality. If you handle steers roughly, they could have bruises that will show up on the carcass after slaughter. Bruised meat must be cut off and thrown away, lowering the value of the carcass. To avoid bruised carcasses, be especially careful when loading and unloading steers. Never hit a steer hard with a solid object. Also check pens, trucks, and alleyways for sharp or protruding objects that could puncture or bruise the steer.

9. Follow appropriate feed processor procedures. If you grind and mix your own feed, make sure feed does not become contaminated by birds, rodents, or chemicals. Make sure ingredients are measured carefully so that the finished product is nutritionally correct.

Meat Quality

Meat quality is how good beef looks and tastes to the people who eat it. Consumers look at color, leanness, and marbling in fresh beef cuts. Color should be a bright cherry red. The outside of a beef cut should be trimmed of nearly all fat, although a reasonable amount of marbling should be sprinkled in the lean portion of the cut. Marbling makes the beef juicy and flavorful. Remember that dairy beef calves must receive a high-energy diet to produce marbled, high-quality meat. Go to a grocery store and look at packages of fresh beef steaks to observe differences in marbling and color.

Marbling is mostly controlled by genetics,

length of time on feed, and the types of feed used. The amount of fat remaining on the outside of fresh beef is mostly determined by the person doing the trimming. However, beef producers can help ensure that beef cuts are the correct color.

If steers are stressed in the few hours before slaughter, they stand a greater chance of producing dark-colored beef. Therefore, they should be handled carefully and calmly and should not be allowed to overheat. Also, cattle should be rested for several hours after unloading at the slaughter plant before being killed.

Ethics

Being ethical means “doing the right thing.” Behaving ethically before and during the roundup is your responsibility. Many counties require roundup participants to sign the following “code of ethics” before the roundup. Things you do or say, and the way you behave toward your animals and other participants reflect directly on the public’s perception of agriculture.

Four Areas of Livestock Ethics

For livestock projects, ethics includes the principles given below.

ANIMAL CARE AND OWNERSHIP

1. You should purchase your animal by your county’s ownership deadline.
2. You should feed, water, and care for your own animal each day.
3. You should be able to present proof of ownership and age of animal, if requested.
4. Adults should mentor, coach, demonstrate, and teach, but should not do the work.
5. You should watch out for your animal’s well-being, make sure it is comfortable, and cause minimal stress when handling it.

HONESTY AND SPORTSMANSHIP

1. You should act with honesty and integrity and display good sportsmanship at all times.
2. You should not interfere with show officials, program sponsors, other exhibitors, or judges.

3. You should treat everyone with courtesy and respect.

4. You should do your best in competition, but realize you may not always win a blue ribbon.

5. When you compete, you should have a performance goal, not a “beat everyone else” goal.

6. You should not, nor should you allow anyone else, to criticize officials, sponsors, other exhibitors, or judges.

ANIMAL HEALTH AND BIOSECURITY

1. You are responsible for the health and welfare of your animals.

2. You are responsible for reading show rules and obtaining required health tests and papers from a licensed veterinarian.

3. You should present required health certificates upon request of authorities.

4. You are responsible for ensuring that your animals do not infect other animals at a show or roundup. In other words, if an animal is sick, leave it at home!

ETHICS AND CONDUCT

1. You should be involved in this animal project to develop animal, personal, and interpersonal skills, not simply to win in the show ring and make money.

2. You should read and abide by any county or state codes of conduct.

3. You should read and abide by all show or project rules.

4. You and your parents or guardian are absolutely responsible for your project animal and your behavior. Your conduct reflects all of 4-H and the entire agricultural industry.

If you observe someone else acting in an ethically wrong or questionable manner:

- a. You should bring any questionable acts you observe to your parents.

- b. You and your family should take concerns or problems to the proper program authorities.

- c. You and your family should agree to display good sportsmanship and abide by that authority’s decision.

Words You Should Know

Antibiotic: Substance fed or injected to treat disease.

Ethics: Doing the right thing.

Quality assurance: Assurance to the consumer that beef is a safe and wholesome food.

Veterinary/Client/Patient/Relationship (VCPR): Relationship where you and a veterinarian make animal health decisions for your project animal as a team.

Withdrawal time: The minimum time that must pass between when an antibiotic or vaccination is given to a steer and the steer's slaughter.

Suggested Activities

- Visit a grocery store and note differences in beef quality.
- Ask local beef producers what steps they take to ensure beef quality.
- Become quality-assurance certified through a recognized program.
- Talk to your parents about ethics at their jobs.
- During a club meeting, make up a fictional ethical dilemma and work through the potential consequences.

Ideas for Presentations and Talks

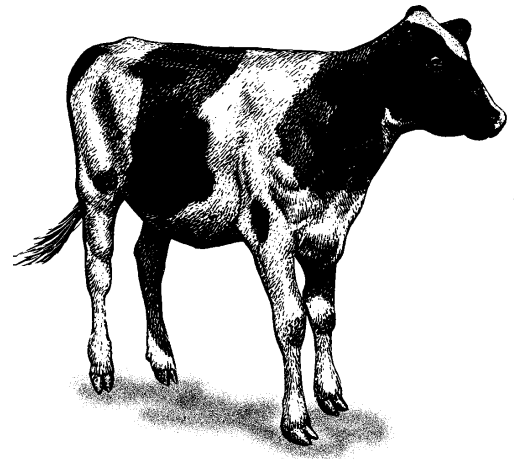
- Factors affecting beef quality
- Identifying good quality beef in the supermarket
- The importance of quality-assurance programs
- Successes of quality-assurance programs
- The importance of ensuring beef quality
- The importance of ethics in 4-H animal projects

Things to Talk About

- How do you ensure that the beef from your calf will be safe and high quality?
- What are some different definitions of beef quality?
- Why should you still worry about quality assurance even if your calf is not being slaughtered immediately?
- What could you do if you observe an ethical problem?



10

The Roundup

At the start of your steer project, decide if you are going to show your calf in a livestock show or roundup at some point. If so, you need to plan and prepare for the show.

Objectives

After studying the materials and completing the suggested activities for this section of your project, you should be able to:

1. Plan for a dairy feeder show from start to finish.
2. Prepare a steer for show.
3. Acquire basic equipment needed to show a steer.
4. Understand the basics of being a good show person.
5. Understand basic concepts of good sportsmanship.

Showing your steer has several benefits. You will learn a lot about yourself and your steer. You are sure to learn how to be patient with your animal! Most 4-H'ers enjoy the fun and excitement of friendly competition in a show ring. Showing your steer will also give you a chance to compare your project animal with those of other 4-H'ers.

If you plan to show your steer, the first thing you need to do is obtain a copy of the rules and regulations for the show you want to enter. This will give you the proper dates to go by and information about the show, including prize money you could win. Where you want to show your

steer will affect where and when you should buy your 4-H project steer. The show rules will also tell you the following information:

- Entry forms needed
- Animal health regulations and papers needed
- Required identification (some counties require a weigh-in at the beginning of the project)

What Do You Need to Do and Have?

You should start preparing for the roundup several months in advance. Be sure your entries are submitted well before the entry deadline. Schedule a veterinarian to do any required health tests and vaccinations. Arrange trucking to get you calf to the roundup.

You will have to buy some equipment in order to fit and show your steer. You may be able to borrow some of it from your parent or leader, or share it with another 4-H'er. You will need the following:

- Health papers
- Proof of entry
- Project book completed to date
- Garden hose
- Feed pan
- Bucket
- Fan (if needed for ventilation during hot weather)
- Bedding (if not provided at the roundup)
- Feed (hay and grain)
- Pitch fork and broom

- Clean rags
- Rice root brush
- Curry comb
- Livestock soap
- Rope and show halters
- Neck rope
- Scotch comb
- Blocking chute (optional)
- Blower (optional)
- Electric clippers
- Extension cord
- Clean rags
- Show clothes (check show rules for what to wear)

Loading and Unloading Calves

Well before the date of the roundup, arrange to have someone truck your calf to the roundup site. The vehicle (truck or trailer) used to transport calves should be well constructed, well ventilated, and properly bedded to keep cattle comfortable. It is much easier to get cattle on and off a trailer than it is a truck. Check that the flooring is not slippery when wet. Give some thought to how you will load the calf. If your steer is well broken, loading should be easy. When you arrive at the roundup, there should be a ramp or other means to unload steers. Many steers are uneasy in new surroundings and may not be as calm as they were at home. Be sure to have a parent or other adult help you unload and move your calf when you first arrive at the roundup.

After unloading, your steer will most likely be weighed and tagged. Your leader or extension educator may check your project record book, so be sure it is up to date! Roundup officials will divide the classes based on steer weight and post the classes before the show begins.

Tie your steer in its assigned spot and bed, feed, and water it as soon as possible after unloading. Water at the roundup location often tastes different than the water your steer is used to drinking. If your steer won't drink the water at the roundup, you may have to bring some water from home. This problem can be avoided by

adding some flavoring to the water at home for several days before the roundup, then adding the same flavor to the water when you arrive at the roundup. Dry molasses or flavored gelatin both work well. You may consider limiting the feed and water to half of what the steer normally gets before you leave home so that way your steer will be ready to eat and drink soon after getting to the roundup. Be aware that even with extra preparation, sometimes steers will be excited by their new surroundings and may not initially eat or drink. You are now ready to begin the final preparations for the show.

Hoof Trimming

About a month before the show, decide if your calf's hooves need to be trimmed. Calves raised on a manure pack often have long hooves. Hooves grow just like your fingernails and can cause calves to walk improperly. If hooves show signs of excessive growth, they should be trimmed before the show so that your steer stands and walks more correctly. You can trim the hooves yourself, but having them professionally trimmed ensures they are done properly and may be safer for you and your calf. Some 4-H clubs schedule a day and place for all club members to bring their calves for hoof trimming.

Fitting Your Steer

Remember these two rules when fitting your dairy beef calf:

1. Fitting will not make up for an improperly fed, thin calf.
2. The purpose of fitting a dairy beef steer is to make it look like an ideal beef feeder calf rather than a dairy heifer.

BODY CLIPPING

You have two options for fitting your dairy beef calf. The first is to body clip the calf. This approach is the simplest and is preferred for calves that are nicely balanced and in good flesh. To body clip the calf, run your clippers with (not against) the grain of the hair downward from the

top of the calf to the calf's underside. Make sure to clip everywhere, including the calf's face, sheath, and legs. Body clipping is best accomplished a week or two before the show so that any clipper marks have a chance to grow out and become unnoticeable.

FITTING WITH HAIR

The second option is to fit your calf like a beef feeder steer using the calf's hair to accentuate its good points and deemphasize its not so good points. If you choose this option, you are trying to make your steer appear more heavily muscled and more nicely balanced by manipulating the hair of the animal. The amount of hair your steer has depends on the genetics of your steer, the timing of your show (steers in summer shows usually have much less hair), and how much work you put into stimulating hair growth at home. If your steer has very short or very curly hair, slick shearing your calf may be best.

When the weather warms up in the spring, you need to make sure the old, dead hair on the steer is shed out. You can accelerate this process by brushing your steer frequently. Some people body clip their steers at this time of year to remove all old, dead hair. If you decide to do this, clip in the direction the hair lays naturally—generally down.

After the old hair is shed or clipped, you can begin rinsing your steer with water several times each week to aid in training the hair and to stimulate hair growth. Rinsing is best done in the evening before turning your steer out or early morning when you first bring your steer in from its lot. If you have a blower, dry your calf by blowing the hair up and forward. If not, use your scotch comb to pull the hair up and forward and allow the steer to dry naturally. In the end, the hair on the steer's body should stand upright like a carpet. Every week or two, you can wash your steer using a mild livestock shampoo. Make sure you rinse all the suds out when you wash your steer because soap residue can cause dandruff.

About three weeks before the roundup, begin



preliminary clipping or “blocking.” If this is your first calf project, get someone to help guide you and give you directions. If you have had steer projects before, you (not mom, dad, or a professional fitter) should do the clipping. Four areas on the calf's body should be clipped at this time: head, neck, tail, and sheath.

Clipping is easiest to accomplish if the steer is restrained in a blocking chute. The steer should be freshly rinsed and thoroughly dry. Begin by clipping all the hair off the calf's head. Blend the hair in around the base of the ears. You will probably need to remove the halter to properly clip your steer's head.

Next, clip the top of the steer's neck from behind the head to a point where the steer's neck and topline come together. From this point, clip a straight line down across the point of the shoulder to the inside of the front leg. Repeat on the other side. All hair forward of this line should be removed. Always clip with the grain of the hair (downward) when clipping the neck. Blend in the line from the clipped portion to the unclipped portion. If you are clipping in a blocking chute, you will probably need to back the steer out of the neck restraint to have access to the steer's neck.

The tail should be clipped upward from a point toward the bottom of the twist to 4 or 5 inches below the tailhead, blending at both ends of the clipped portion. Clip so that the side view of the tail is a straight line. Also, most fitters “bob” the tail about one inch below the bottom of the tail bone.



Finally, clip both sides and the bottom of the sheath to make the steer's middle look slimmer.

Several commercial videos are available to help you learn to be a better fitter. Perhaps your club could purchase a set of these for all members to use.

Within a couple days of the roundup, you should do the final clipping. If you did your preliminary clipping correctly, the final clipping should simply be a matter of further blending the clipping that was already done and shaping and smoothing the hair on the steer's body. Two new bits of clipping need to be done. The first is to clip the steer's quarter to make the steer look wider and heavier muscled when viewed from behind. Your task is to make the quarter on either side of the tail look as flat as possible. Begin by clipping a flat strip along each side of the tail, very near but not quite down to the skin. The edge of the clipper nearest the tail should be slightly closer to the skin than the outside edge of the clipper blade. Then take another strip beside that one, blending it into the first strip on the inside and to the natural hair on the outside. Ask an experienced fitter to show you if you are not sure what to do.

The second new place to clip is the steer's topline. You want the topline to look straight when viewed from the side, and flat/wide when viewed from behind. Clipping the topline can be time consuming and is one of the most difficult clipping jobs.

FINAL PREPARATIONS

Final preparations should begin several hours before the show. You should wash, thoroughly dry, feed, and water your steer before you begin final preparations. Place your steer in a grooming chute. If you body clipped your steer, simply dry the calf and make sure there are no stains.

If you are fitting your calf with hair, pull or blow the hair up on the entire body of the calf. Some counties allow the use of adhesives and other fitting products for final preparations. Make sure you know if your county permits them. If so, check with experienced fitters and be sure to follow directions on the label.

Clean any manure from the hooves and dew-claws with a wire brush or knife. Put on the show halter and get yourself cleaned up and ready for the show.

Showing Your Steer

Showing a dairy beef calf is exactly the same as showing a finished beef steer; it is not like showing a dairy cow or heifer. The best way to learn is by watching someone else do it. Work with an experienced beef or dairy beef showperson, such as another 4-H'er in your club. He or she could practice with you and show you how to move and set up your steer.

At the show, you will be asked to lead your steer into the show ring with other show persons



and their steers. Your job is to set up the steer with its four feet positioned squarely underneath the body, then pay attention to the judge while keeping the steer between you and the judge.

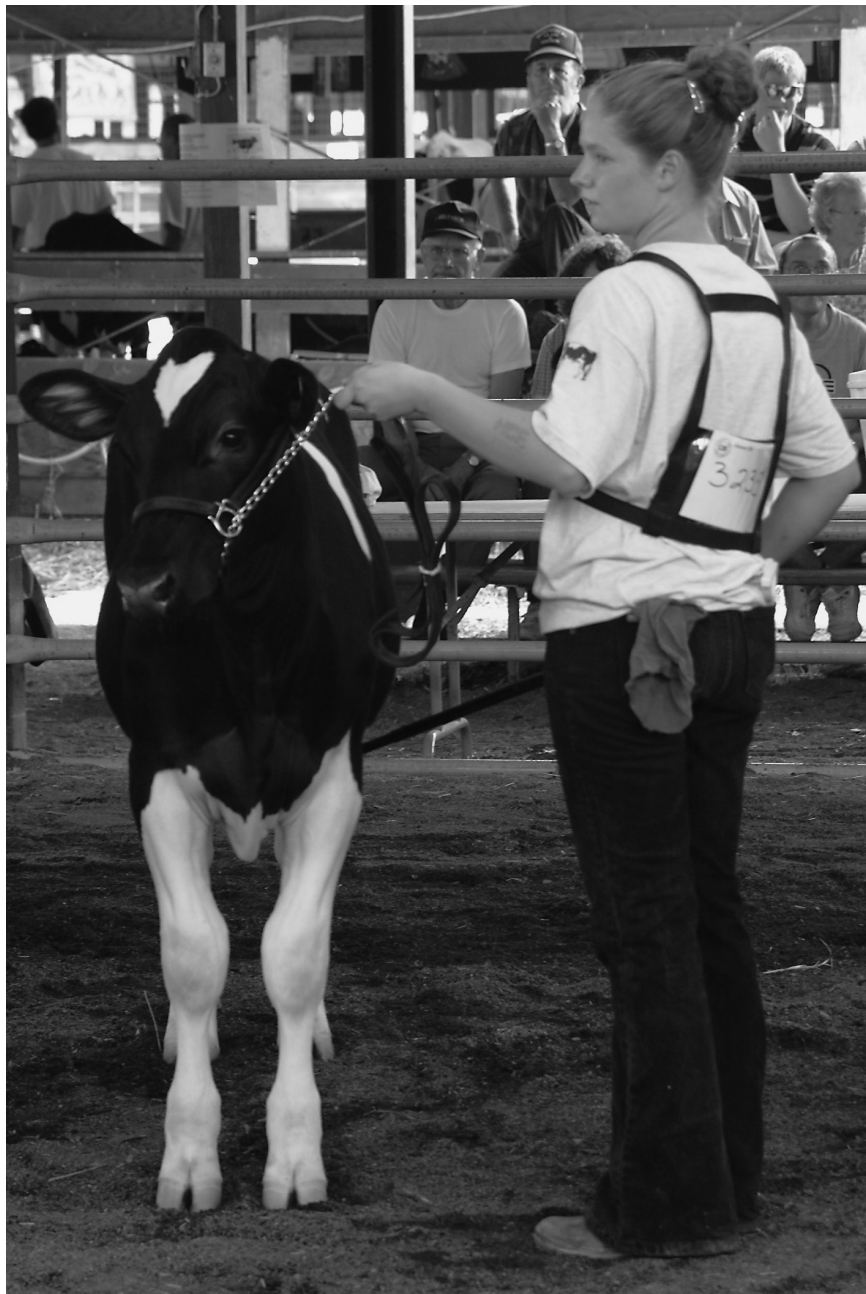
What will the judge look for in you and your steer? This usually includes three things:

- Type or conformation—how similar the steer is to the ideal animal for its purpose. For example, a class of feeder steers would be judged on their frame size, muscling, balance, structure,

and “bloom,” which indicate a good nutritional program.

- Showing—how well the show person controls and presents the animal.
- Fitting—how well the animal is cleaned and groomed.

If you did your halter breaking and leading training while your calf was small, preparing for the show should be simple. Practice leading your steer in clockwise circles, stopping periodically



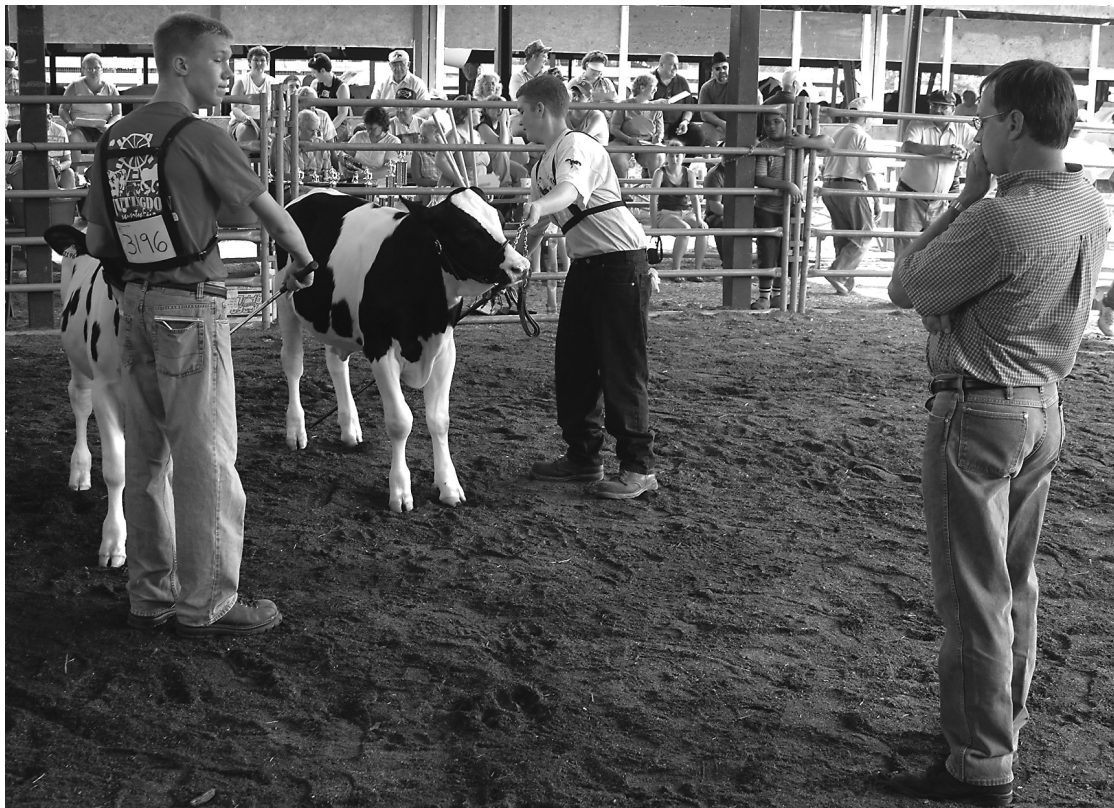
to set it up with a show stick. Practice using the show halter you plan to use on show day. To set the steer's feet, switch the lead from your right to left hand and turn to face the steer. Place the right rear foot squarely under the steer's body. Follow by placing the left rear foot, then the right and left front feet. You may use your foot to move and set the front foot closest to you. Space the rear feet slightly wider than the front feet to make the steer look wider and more muscular from the rear. You can push in the fleshy spot between the toes to make the calf move its foot back. Pulling on the dewclaw with the hook on your show stick should make the steer bring its foot forward. After your steer is set up, scratch its belly with your show stick to keep it calm. Teaching your steer how to set its feet properly takes a lot of practice and repetition.

If the steer moves its foot, gently reposition it. Practice slowly moving in front of the steer as if the judge were walking in front of the steer.

During the show, your job is to present the steer to the judge. You will need to be able to keep

the steer between you and the judge at all times except for a brief instant when the judge walks in front of the steer. You will also need to be able to watch the steer and the judge at the same time. In the show ring, set up your steer even with the steer ahead of you, allowing plenty of room between your steer and the others in the class. If you can, place your steer's front feet on a high spot in the ring. All livestock look better if posed with their front feet slightly higher than the rear feet. Set up your steer and be ready to reposition yourself or your steer if the judge moves in front of you or if your calf moves a foot. Pay attention to the judge and quickly and smoothly follow any instruction. If your steer acts up or gets out of position, walk it in a circle and return to your assigned spot to set up. Ask a parent, sister, or brother to act as a judge, and practice showing the steer to them. If this is your first calf, ask an experienced show person or your leader to demonstrate good showmanship and give you pointers.

During the show, the judge may ask you questions about your calf or how you raised it. Be sure



you know some basic information so you can give an intelligent answer.

On show day, make sure you and your steer are both calm, well rested, fed, and watered. When you enter your steer in a show, you are also entering yourself. Keep yourself clean and neat, too. Wear clean clothes and clean boots or shoes and brush your hair. Some shows have dress codes that must be followed. You should not wear a hat. Have your steer ready when your class is called. Be prompt! If you have time, watch a few classes before you bring your steer in to see how the judge moves the class around from the time cattle enter the ring until they leave. Have someone help you get your steer to the show ring and back to its stall after the class.

Always be courteous to other show people in the class. Be pleasant and make eye contact with the judge at every opportunity. Immediately follow any instructions the judge may give. If the judge asks you to move your steer or lead it around the ring, do so at once.

After the show, be sure to wash out any adhesives and other show products using a commercial adhesive remover. Soap and water will not remove these products. Failure to wash adhesives out leaves the hair matted and in poor condition.

Being a Good Sport

Although everyone may deserve a blue ribbon, only one first place can be given in each class. If you win a blue ribbon, be proud, but don't show off. Accept congratulations with thanks and congratulate your fellow show people. Even if you do not win a blue ribbon, remember to be proud of what you did accomplish. Most importantly, have fun and think about all the things you learned about yourself and about dairy feeder calves while taking this project. Try again the next year for a blue ribbon!

Questions from the Public

You may be asked questions about your project by interested visitors at the show. If you are, be courteous, honest, and direct with your answers.



Sometimes animal rights advocates attend livestock shows with the intent of creating a controversy worthy of news coverage. If someone accuses you of being cruel to your steer, be polite, remain calm, answer what questions you can, and end the conversation as quickly as possible. Report the person to your parent or leader.

The Sale

After the roundup, many counties hold a junior livestock sale where project calves are sold. Often, steers sold at junior livestock sales bring more money than the current market price. Buyers may purchase steers for many reasons—as advertisement for a business, as a “thank you” for doing business with them, as a source of high-quality feeder calves, or simply as a way to help young people. If you elect to participate in the sale, you—not your parents, leaders, or county extension educators—need to do some work ahead of time to ensure that your steer will receive the best possible price. Remember that marketing is an extremely important part of the beef cattle business!

First, find out the rules for your sale. What, if any, commissions are charged? Is trucking available? Do buyers have to keep the steer, or can they resell it? Many sales offer a buy-back program where, if a buyer does not want to keep the steer, he or she pays only the difference between the actual bid and the current market value. Generally, a local feedlot has agreed to pay the current market

value for calves bought but not kept. Regardless of who takes your steer home, you receive the final bid price. Therefore, it pays to contact as many potential buyers as possible about attending the sale and bidding on your steer. The more bidders that are at the sale to bid specifically on your steer, the more your steer may sell for.

Begin by making a list of businesses in your area that may be potential buyers. Don't limit yourself to agricultural businesses. Restaurants, grocery stores, insurance companies, banks, lumber companies, trucking companies, and others support junior livestock sales in many areas. Next, compile a list of contact people for each of the businesses. Ask your parents, leaders, or neighbors if they know anyone employed by each of the businesses, preferably in a management position.

Next, make plans to contact each of the people on your list. Many 4-H'ers write letters asking for support at a junior livestock sale. Personal visits are better. Call the business and ask for a meeting with your contact person. At the meeting, be prepared to explain why you are asking for their support, how buying at a junior livestock sale may benefit their business, and if your county has a buy-back program and how it works. If your county has a buy-back program, make sure buyers realize they do not have to take the calf home with them. Be sure to note that any money they spend over and above the current market price is tax deductible. You may even have to explain how an auction works, so make sure you know!

Initial buyer contact should be made a month or so before the roundup. You should follow up with a phone call within a week of the sale to remind the buyers of the date, place, and time. Expect some people you contact to decline to participate. That's okay—at least you asked! Also, tell prospective buyers that first want them to come and support the junior livestock sale and, second, you would like them to bid on your calf.

On sale day, try to look up your buyers before the sale starts and thank them for coming. Immediately after the auctioneer pronounces your calf

“sold,” listen carefully to who the buyer was. Tie your steer, and then ask your leader or a sale clerk to point the buyer out in the crowd. Go find the buyer and personally thank him or her.

Within a week after the sale, send a thank-you note to the buyer and ask that he or she consider supporting the sale next year.

Suggested Activities

- Visit a beef cattle show to see how others show cattle.
- Attend a fitting and showing clinic.
- Train and fit a dairy feeder calf for show.
- Show your steer at a show.
- Give a presentation or talk on how to fit and show a steer.
- Discuss fitting and showing with an experienced show person.
- Make a poster to advertise your 4-H show or auction.
- Invite a person who is interested in 4-H to attend your 4-H show or auction.
- Write a thank-you note to the person who buys your steer at a 4-H auction.

Ideas for Presentations and Talks

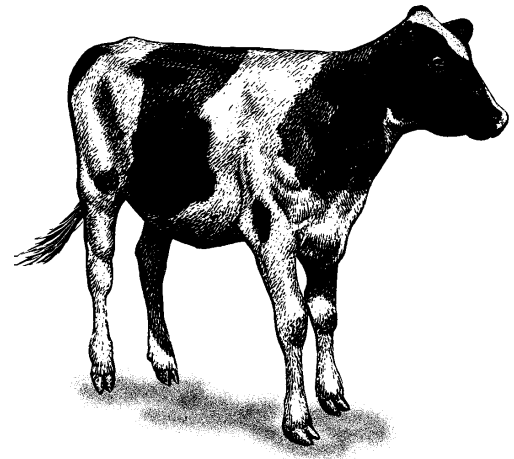
- How to prepare a dairy feeder calf for show day
- Equipment needed to show a dairy feeder calf
- How to fit a dairy feeder calf
- Your experiences showing a dairy feeder steer
- Contacting buyers for a sale
- Differences between fitting and showing dairy heifers and dairy feeder calves

Things to Talk About

- What steps must you take if you want to show your steer?
- How do you show a dairy beef calf in a show ring?
- What equipment do you need to fit and show dairy feeder calves?
- How do a good show people act when they win or when they do not win?

11

Keeping 4-H Records



When you write down something that you did or that happened, you are keeping a record. Records help you remember important information.

Records can prove what was done, who did it, and how much money it cost to do it. When you grow up, you will need records so you can pay taxes, borrow money, buy a house, or apply for a job. Keeping good 4-H records may help you to win an award or college scholarship.

Objectives

After studying the materials and completing the suggested activities for this section of your project, you should be able to:

1. Explain why people keep records.
2. List the kinds of records 4-H members with steer projects should keep.
3. Set up a record keeping system for your steer project.
4. Complete your 4-H project record book.

Why Keep Records?

Records are used to prove what was done and to help make decisions. Good records can tell you if your steer is costing or earning you money. They can be used to tell you if your calf is growing as fast as it is supposed to. They can be used to identify health or nutritional problems. Records are an important part of all 4-H steer projects.

Kinds of Records

Several kinds of records should be kept by 4-H members who raise market steers. These are:

- financial records
- animal performance records
- animal production records
- records of management and quality-assurance practices used
- records of participation in training, activities, and events

FINANCIAL RECORDS

Financial records tell you about the value of what you own and how much money you spent and received. Your records should include these kinds of financial records:

1. Inventories of animals and equipment. These are lists of how many animals or pieces of equipment you owned and what they were worth when your project started and ended.

If you are required to turn in your 4-H record before you have sold some of your animals, you will need to estimate what they are worth on the day your record ends. You may get a high price when you sell animals at a 4-H auction, but it is a good idea to use real-world prices to estimate what your animals are worth. Look in farm newspapers and magazines to find out prices of animals at nearby markets.

2. Expenses. These are amounts of money spent to buy animals and the things used to care for them, including feed, supplies, equipment, and

veterinary care. Feed costs should include costs of all feed eaten, not just the feed you buy. Home-grown pastures and feeds cost money to grow and could have been sold to someone else. They are not “free” when your animals eat them. Your parents and leaders can help you estimate what they are worth.

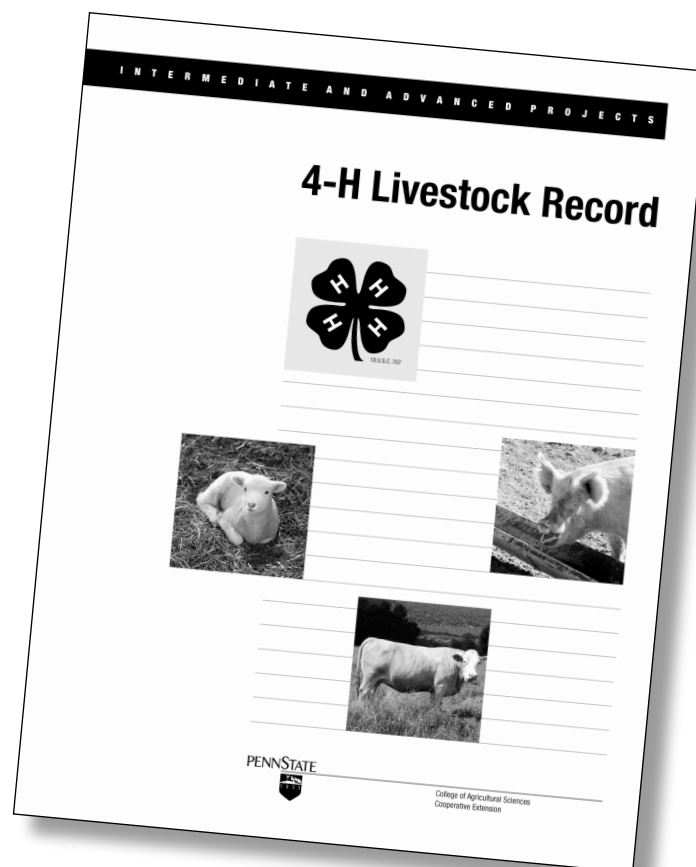
3. **Income.** This is money received from selling animals, animal products, and other things related to your project. It should also include premiums won at shows. If your income is more than your expenses, you have made a profit. If your expenses are more than your income, you have a loss.

ANIMAL PERFORMANCE RECORDS

Animal performance records are records of how individual animals grow and use their feed. In order to keep performance records, animals need

to be identified with ear notches or ear tags. Write down the identification number, date of birth, and sire and dam of each steer, if known. Some examples of performance records are weights, average daily gain, amounts of feed eaten, and efficiency of feed conversion.

Weights can be measured using a scale or can be estimated using a weigh tape. Some counties have a day when they weigh and identify steers at the start of a 4-H project. Good times to weigh steers are when you buy them and sell them, or when you will be doing other things such as weaning, deworming, or vaccinating them. You should know how much your steer weighs to calculate the dosage for some dewormers or medicines. Record the weight of your steer at each weighing.

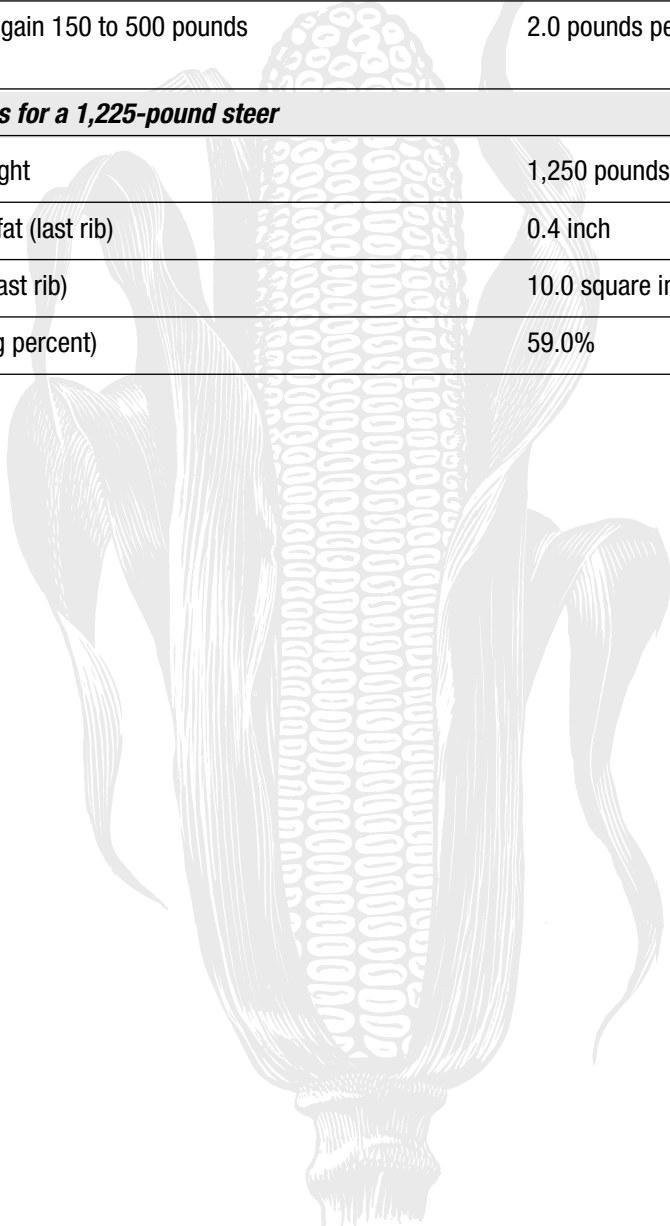


DAIRY BEEF FEEDER STEER PERFORMANCE TRAITS

<i>Feed consumed per day (pounds)</i>	<i>Average</i>	<i>Range</i>
Milk Replacer	1.1	1.0–1.25
150-pound calf	3	1–5
300-pound calf	7	4–10
600-pound steer	16	12–20
900-pound steer	21	15–28
1,200-pound steer	24	18–32
Dry feed eaten per pound of weight gain	7.0 pounds	6.0–8.0 pounds
Total feed required from 150 to 500 pounds	2,625 pounds	2,300–3,100
Average daily gain 150 to 500 pounds	2.0 pounds per day	1.5–3.5 pounds/day

Carcass traits for a 1,225-pound steer

Slaughter weight	1,250 pounds	1,150–1,350 pounds
Average backfat (last rib)	0.4 inch	0.1–0.8 inches
Ribeye area (last rib)	10.0 square inches	8.0–12.0 square inches
Yield (dressing percent)	59.0%	57.0–61.0%



Average daily gain can be calculated if you weigh your animals more than once. Subtract the first weight from the second to calculate pounds gained. Calculate average daily gain by dividing pounds gained by the number of days between the first and second weighing. You should do this every month or so to see if your steer is gaining as fast as it should.

Feed intake can be calculated if you keep track of what kind of feed and how much feed you give to each animal or group of animals. When you buy or mix feed, write down the date, cost, weight, and kind of feed bought. If you mix feed at home, write down the amount of each ingredient mixed.

Efficiency of feed conversion can be calculated if you know how many pounds of feed your animals ate between weighings. Calculate efficiency of feed conversion by dividing pounds of feed eaten by pounds of weight gained.

Below are some average market steer performance traits. Compare the performance of your steer with the averages. These guidelines are not based on any particular resource; they are simply a guideline of the performance of “average” steers. Your steer’s performance will vary depending on genetics, your management ability, and your facilities. Most steers should fall within the ranges indicated.

ANIMAL PRODUCTION RECORDS

Production records are not kept for meat animal projects. Production records are records of how many calves or other products are produced by an animal. For dairy cows, they include dates when a cow calves and her milk production records. They may also include the milk production of her progeny. Other kinds of production records kept for animals other than cattle are amounts of wool or eggs produced. Since market dairy feeder calves don’t produce any products other than their carcasses at slaughter, you won’t need to keep any production records for dairy feeder steer projects.

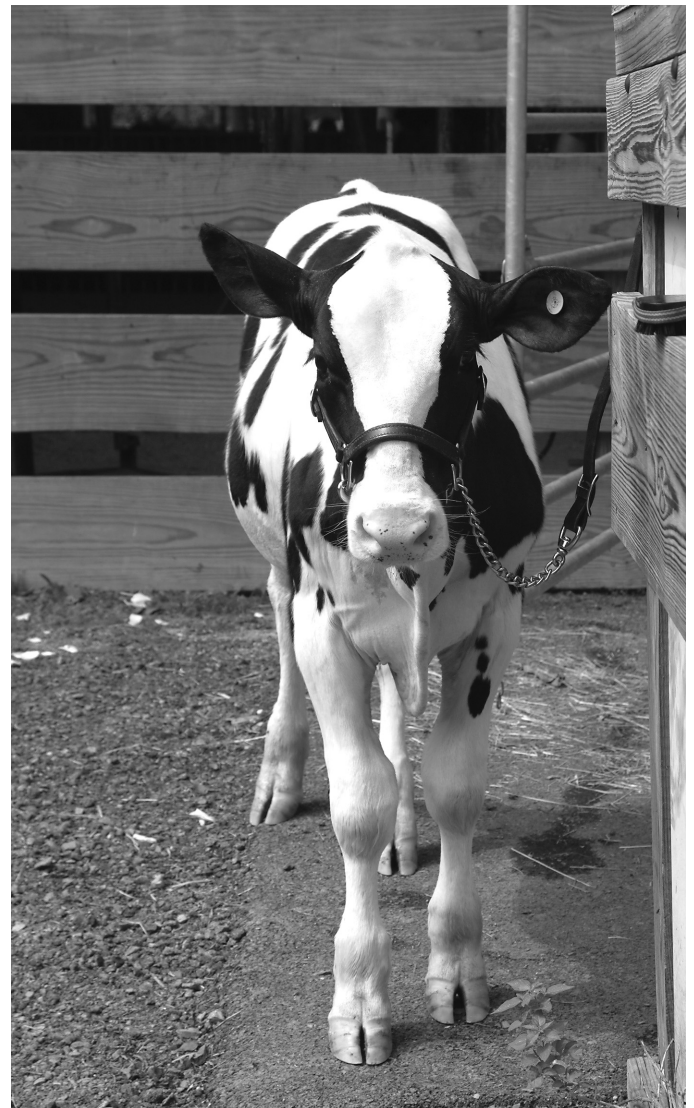
Below is an example of an animal production record associated with breeding beef cattle.

	<i>Average</i>	<i>Range</i>
Calves weaned per cow exposed	0.85	0.75–0.95

MANAGEMENT PRACTICE RECORDS

Write down the things you do to care for your animals. Also write down when, how, and why you do them, and which animals were involved.

Keep records of dates when you buy and sell steers, or when a steer dies. Other dates to write down are dates when steers are sick, dewormed, vaccinated, or blood tested. If you treat an animal with a medicine or vaccine, write down the name of the product, how much was given, which



steer(s) you treated, why you treated the animal, and the withdrawal time of the medication. These records are important for beef quality assurance. See the sample quality assurance health chart in Appendix C.

YOUR 4-H ACCOMPLISHMENT RECORDS

In addition to the records you will keep detailing what you do with your steer, there are some other kinds of records you should keep when you are in 4-H. These include:

- Activities in which you participated, such as camps, contests, and achievement programs
- Special skills and knowledge you learned
- 4-H accomplishments, such as projects completed and things you made
- Offices and other leadership roles you held
- Awards you or your steer received

Words You Should Know

Estrus: The period of time when a heifer or cow can be successfully mated.

Expenses: Money you spend for products or services.

Financial: Related to money.

Gestation: The time of pregnancy between mating and calving.

Income: Money someone else pays to you.

Loss: Money you lose when your expenses are more than your income.

Profit: Money you keep when your income is more than your expenses.

Suggested Activities

- Discuss records you should keep and how to keep them with your parent or club leader.
- Keep a diary or barn chart that lists dates and what happened when you do something with your animals. Be sure to include who was involved, what happened, and when, where, why, and how it happened.
- Complete a "4-H Animal Project Record for Beginners" or "4-H Livestock Record for Intermediate and Advanced Projects."

Extra Activities to Try

- Weigh a project animal more than once. Calculate how much it gained and its average daily gain. Compare with the listed averages.
- Discuss how to use your records to make decisions about management of your project. Do this with your leaders and members of your club.
- Calculate the efficiency of feed conversion of your calf. Compare with the listed averages.

Ideas for Presentations or Talks

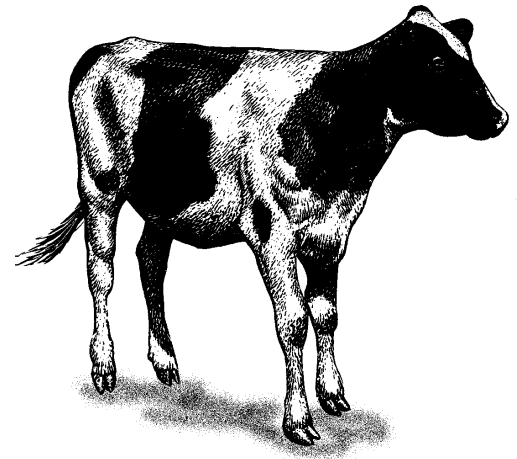
- Kinds of records to keep on your dairy beef feeder calves
- How to fill out a project record for your market steer
- How to calculate profit and loss
- Why records are important
- How to use a weigh tape to estimate an animal's weight

Things to Talk About

- Why do people keep records?
- What kinds of records should 4-H members keep?
- What kind of information belongs in your 4-H dairy beef feeder steer record?
- How can you use your 4-H records to make decisions about how to manage your animals?

12

Beef and By-Products



Beef provides people with valuable meat and many useful by-products. Steaks, roasts, hamburger, and hot dogs are just some of the delicious meat products that come from cattle. Cattle also provide leather and other useful products. Most of us can find some of those products in our own homes.

Objectives

After studying the materials and completing the suggested activities for this section of your project, you should be able to:

1. Explain what beef is.
2. Tell what a nutrient is.
3. Name some of the nutrients people get from eating beef and a use for each in the human body.
4. List examples of meat products made from beef.
5. Name some of the by-products that come from beef.

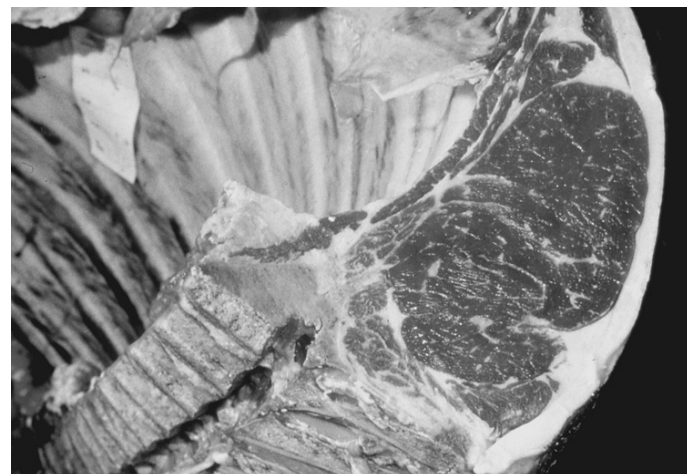
Beef

Meat is the flesh of an animal after it has been killed. Meat from cattle is called beef. Meat is mostly muscle, but also contains bone and fat. People prefer to cook and eat the muscle, which is the lean part of meat. The bone and fat can be removed and discarded before or after cooking.

People eat beef because it tastes good and provides their bodies with nutrients. Nutrients are the necessary chemicals in foods that humans

and animals use to help support life. Meats provide nutrients such as water, protein, fat, vitamins, and minerals. Water helps move other nutrients through the body. Protein can be used to make and repair muscles. Fat provides energy. Vitamins and minerals are important to bone formation and help make the body work right. Beef is a very good source of protein, energy, and some vitamins and minerals. Thiamin, niacin, and riboflavin are important vitamins in beef. Iron and zinc are two important minerals people get from eating beef. Beef doesn't provide all the nutrients needed by people, so we need to eat other kinds of food, too.

Cuts of meat from different parts of an animal's body have different names. After cattle are slaughtered, their carcasses are chilled and cut into large pieces called wholesale or primal cuts. These are specially packaged, kept refrigerated, and shipped to supermarkets. In supermarkets,



they are cut into smaller pieces of meat called retail cuts that are ready to sell to customers. Thin pieces of beef loin are called steaks. Large, thick pieces from the shoulder or round (hind leg of a beef carcass) are called roasts. Beef can also be ground and made into hamburger.

Other Products from Beef

Leather from the hide is an important by-product. Leather is used to make products like shoes, coats, furniture covers, as well as many others. Other by-products include health care products such as insulin and tallow. Pet foods are also made from by-products of beef processing.

Fat that comes from the beef carcass during processing is used for a number of different products. The most common use is for making soaps.

Words to Learn

Nutrients: Chemicals in foods that humans and animals use to help support life.

Processing: The act of cutting carcasses and making them into products that can be sold.

Protein: A complex nutrient the body uses to make muscle and bone.

Vitamins: Nutrients needed in very small amounts to help the body work properly.

Suggested Activities

- Name four or more of the nutrients people get from eating beef. List a use for each in the human body.
- Make a list of by-products that come from beef. Prepare a poster showing pictures of many of those products.
- Make a list of the benefits people get from eating beef products. Prepare a poster, display, or advertisement to share this information with your club or a market steer buyer.
- Act out a skit or pretend you are making a radio or television commercial to tell people about beef. For fun, have your parent or leader tape record or videotape your commercial.

- Write a letter to a person you want to buy your market steer. Tell why he or she should buy and eat beef.

Extra Activities to Try

- Visit a grocery store or look through the cabinets and refrigerator in your home to find products that come from cattle. Make a list and share it with your parent or leader. Don't forget to include products made with beef by-products.
- Prepare a favorite recipe that includes beef and serve it to your friends or family.
- Have a tasting party or picnic with your club. Bring foods made from different beef products.

Ideas for Presentations and Talks

- Identifying wholesale or primal cuts of beef
- Products people get from steers
- How to prepare your favorite beef recipe

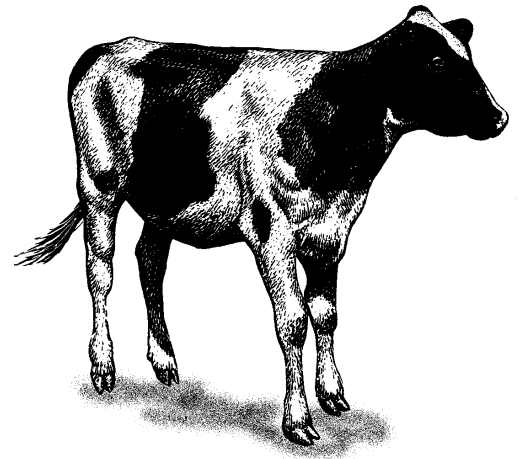
Things to Talk About

- What is beef?
- What are some of the nutrients in beef and how are they used by humans?
- Why do people eat beef?



13

Dairy Beef Management Schedule



Plan

Buy one to two-week old dairy beef calf in January or early February. Market at 5 to 8 months of age and weighing 400 to 700 pounds. Dates will change depending on the dates of your show.

Assumptions

Calves will gain an average of 2.0 pounds each day over the entire feeding period. Plan to show on August 15.



<i>Steer Weight</i>	<i>Things to Do</i>	<i>Sample Dates</i>	<i>Dates for Your Project</i>
Before beginning project	Plan project.	December to January	
	Arrange project financing.		
	Get barn and pens ready for calves.		
	Make sure feeders and waterers are ready to use.		
	Arrange to buy milk replacer, hay, and bedding.		
100 pounds	Buy calf.	February 1	
	Keep new calves away from other cattle for at least three weeks.		
	Ear tag, castrate, implant, and dehorn as appropriate.		
	Check calf for lice and mange. Treat if needed.		
	Introduce calf starter and clean water.		
	Write steer weights and prices in record book.		
	Begin halter breaking and leading process.		
150 pounds	Wean calf when starter intake exceeds 2 lbs/day.	March 1	
	Weigh calf and calculate average daily gain.		
	Evaluate and compare to target.		
	Deworm calf.		
Under 200 pounds	Weigh steers at county weigh-in, if required.	Dates vary	

<i>Steer Weight</i>	<i>Things to Do</i>	<i>Sample Dates</i>	<i>Dates for Your Project</i>
300 pounds	Continue walking and introduce show stick.	May 1	
	Order new show equipment, if needed.		
	Start process of recruiting buyers.		
	Weigh steer and calculate average daily gain.		
	Evaluate and compare to target.		
400 pounds	Have veterinarian do appropriate health tests and send for health papers.	July 1	
	Have leader evaluate your steer and recommend feeding changes.		
	Weigh calf and calculate average daily gain.		
	Evaluate and compare to target.		
460 pounds	Do preliminary clipping.	August 1	
	Make arrangements to have hooves trimmed, if necessary.		
	Make trucking arrangements for the roundup.		
	Make final buyer contacts.		
500 pounds	Show and sell steers.	August 15	
	Write down weights and prices in 4-H record.		
	Send thank-you notes to buyers.		
Daily	Rinse steer.		
	Walk steer.		
	Practice placing steer's feet and showing steer.		

APPENDIX A

How to Tie a Quick-Release Knot



1. Pass the free end of the rope around or through the object to which you want to tie your steer.



2. Cross the free end of the rope over the rope that is attached to the animal.



3. Flip the free end toward the tying post to make a loop.



4. Pull a portion of the free end through the loop. In other words, pull a loop through the loop.



5. Pull on the loop to tighten the knot.



6. For added assurance, put the free end of the rope through the last loop.



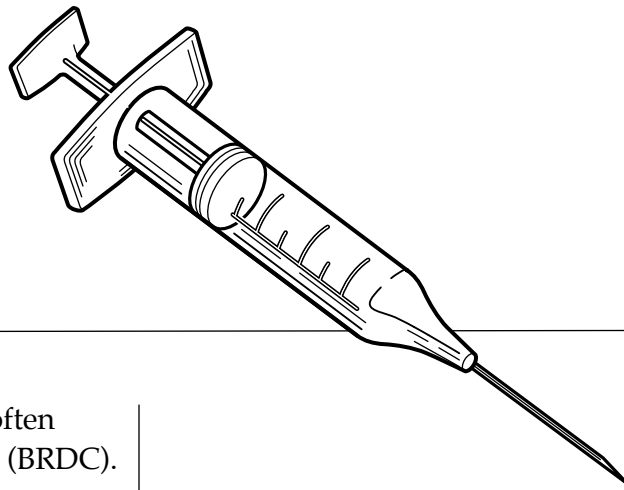
7. To untie the knot, remove the free end from the second loop.



8. To release the knot, pull on the free end.

APPENDIX B

Respiratory Diseases of Cattle



The most common respiratory disease is often called bovine respiratory disease complex (BRDC). This complex is also known as shipping fever. Cattle with respiratory disease normally have two or more viral and/or bacterial infections when showing signs of respiratory disease. The specific viral diseases included in BRDC include IBR (infectious bovine rhinotracheitis), BVD (bovine viral diarrhea), PI3 (parainfluenza), and BRSV (bovine respiratory syncytial virus). Pasturella and hemophilus (secondary bacterial infections) often invade the lungs when an animal is infected with a viral disease.

Cattle can be vaccinated for IBR, BVD, PI3, and BRSV in one of two ways. Genetically altered, modified-live vaccines for all three of these diseases can be blended together in one vaccine or each can be purchased separately. Modified-live vaccines need only be given once for protection against disease, but subsequent immunizations increase the animal's ability to resist infection. Vaccines (blended or individual) can be purchased in a killed form. Killed vaccines must be given to an animal at least twice (at two- to four-week intervals) before they effectively prevent disease. If killed and modified-live vaccines are purchased blended together, a booster shot is necessary to provide full protection.

Vaccines for hemophilus and pasturella can also be purchased together or separately and require an initial dose followed by a booster two weeks later.

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4-H Club Motto

“To make the best better”

4-H Club Pledge

I pledge
my head to clearer thinking,
my heart to greater loyalty,
my hands to larger service, and
my health to better living, for
my club,
my community,
my country, and
my world.

4-H Club Colors

Green and White

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