PENNSTATE

College of Agricultural Sciences • Cooperative Extension

4-H Market Steer Project

REFERENCE GUIDE

Name _____

Address _____

Name of Club _____

Leader's Name _____

Name of Project _____

CONTENTS

1 Getting Started

Introduction

Welcome to the 4-H market steer project! This project can be an unforgettable learning experience. You will do many things to help you undergo personal growth. You will also learn skills that will help you become a more responsible person. Skills you learn from raising a steer 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 to raise a 4-H market steer. There are skills and information to learn and activities to do. Some of the activities everyone should do and others you may choose to do. You should complete six activities per year. Twelve activities are required and should be completed in the first two years of the project. After the first two years, six activities should be selected from either the suggested activities list of this book, or from the "4-H Skills for Life" series, if your county uses them.

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 market steer 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 market steers!

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 beef cattle. Each section includes:

- objectives for that lesson
- information about steers 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 Market Steer Project

Using your *4-H Market Steer Project Reference Guide*, you will learn the fundamentals of being a good beef producer. You will also build skills that will prepare you for life.

Some of the things you will learn about market steer management are:

- why people raise beef cattle
- how to select project steers
- how to feed and care for your steer
- how to keep your steer healthy
- the normal behavior of cattle

- the parts of the steer
- how to fit and show a steer
- how to keep records
- how to prepare for the roundup

Working with your steer 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
- developing values
- preparing for a career

Project Options

Two basic kinds of 4-H beef projects are:

1. Market steers—selection and feeding of one or more feeder steers to market weight.

2. Breeding cattle—care and management of cattle raised for breeding purposes. This project includes (a) selection and management of one or more heifers to breeding and calving age, or (b) management of cows and calves (not recommended for beginning 4-H members).

You will be the one responsible for caring for your cattle. You may choose to take a market steer project, a breeding heifer project, or both kinds of projects each year. Here are some things to think about when choosing market or breeding projects:

- Do you want a short-term or a long-term project?
- How much money can you afford to spend?
- What kinds of buildings, equipment, and feeds do you need?
- How much help can your parents give?

Market steer projects can be completed in eight to ten months. They require fewer facilities and management skills for success than are required for breeding projects. Breeding projects are usually continued for more than one year.

This book contains information on market steer projects only. You will need to get a different reference book if you elect to take a breeding project.

What Do You Need?

Before purchasing a steer, make sure you have everything you need to properly manage it and keep it healthy. If you plan to take on a market project you will need:

- an interest in beef cattle
- a place to keep your steer
- equipment for feeding, watering, and handling cattle
- money to purchase and care for your steer
- support from your parents and leaders

2 Knowledge and Skills Checklist

Market Steer Project Requirements

Your market steer project has three major parts:

1. Caring for one or more market steers each year.

2. Completing activities and learning skills needed to complete the market steer project. You should complete three knowledge skill and three life skill activities each year. A total of 12 activities are required. For the first two years of the project, do six of the required activities each year. A list of the required activities for the first two years is found on page 4. After the first two years, choose six activities from either the lists of additional activities in this book or the "4-H Skills for Life" series. You may do more than the required activities if you want to.

3. Keeping records. The records you should keep are:

- for the first two or three years, a 4-H Animal Project Record for Beginning Members. Start a new one each year. If you have completed two years of another meat animal species (swine or sheep), fill out a 4-H Livestock Record for Intermediate and Advanced Projects.
- the Knowledge and Skills 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 these things 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 which activities you would like to do. Write these goals in your 4-H project record book.

2. Prepare a budget for your 4-H market steer project. (See Section 5.)

2. Select and care for one or more market steers.

3. Keep records of your goals, numbers of steers, 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.

4. Participate in 4-H meetings and activities.

5. Do at least six activities each year. Select six activities from the required list each of the first two years. After the first two years, choose six activities from either the lists of additional activities in this book or the "4-H Skills for Life" series. Have your leader or parent sign the checklist as you finish each activity. You may substitute other activities with your leader's permission.

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

Required Market Steer 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 gender-related terms for beef cattle: cow, bull, steer, and heifer.		
Name and locate at least 10 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, cod (or udder), vulva, testes, and sheath.		
Show and tell the proper way to lead and handle steers.		
Lead your parent or project leader on a tour of the place you keep your steer, 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 to look for to recognize sick cattle.		
Tell what the normal body temperature of cattle is and show or tell the proper way to use a veterinary thermometer.		

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, the 4-H Club Motto, and colors.		
Plan what you will do for your project with your parents or leaders each year.		
Select a project steer using your knowledge of parts and desirable types.		
Keep records of your goals, numbers of steers, 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.		

Additional Market Steer Activities, years 3 and beyond

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

Things to do	*Date done*	*Signature*
Tell what to look for when choosing animals for market steer projects.		
Name at least six breeds of beef cattle raised in Pennsylvania.		
Identify at least six breeds of cattle from their photos or from seeing live animals.		
Describe the important characteristics of your breed of steer.		
Visit a fair or show and listen to the beef judge give reasons for placing the steers the way he or she did.		
Attend a fitting and showing clinic.		
Train and fit a steer for show.		
Show a steer at a fair or roundup.		
Visit a feeder steer auction to learn how steers are bought and sold or to look for steers that might make suitable project animals.		
Visit a large beef feedlot and learn about the feeding and watering system. Also observe how the owner keeps cattle comfortable.		
Find out what veterinary examinations and documents are needed to show a steer at a state show, such as the Pennsylvania Farm Show.		
Describe the normal sounds and behaviors of steers.		
Keep a journal or chart about the health of your steer.		
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.		
Name examples of three or more beef by-products.		
Start your own library of books, leaflets, and magazines about beef cattle.		
Make a kit filled with first-aid supplies and equipment needed to care for your steer and keep it healthy.		
Visit a cattle breeder to look for steers and learn about the operation.		
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.		
Do a market steer skill activity not named on this list. (Add extra pages, if necessary.)		

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 chairman of a committee.		
Serve as an officer of your club.		
Help plan your club's yearly program.		
Help with a fundraiser 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 market steer project.		
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 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 beef or 4-H.		
Help prepare a parade float to tell about beef or 4-H.		
Help 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 market steer. Tell why he or she should buy your steer.		
Write a thank-you letter to a buyer of your steer 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 overnighter.		
Attend a livestock or meats judging practice session, workshop, or clinic.		

Things to do	*Date done*	*Signature*
Participate in a skill-a-thon contest.		
Participate in a stock grower's contest.		
Help another 4-H'er with his or her project.		
Teach a 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.		

3 Background Information

There are some things you should know about steers before you get started.

Objectives

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

1. Name the two major products we get from a steer's carcass and which is the most important in today's society.
2. Write the scientific names for two species of cattle.
3. Explain the differences among the terms: cattle, calf, bovine, feeder calf, steer, finished steer, heifer, bull, and stag.
4. Name two traditional segments of the beef industry.

Why Do We Raise Steers?

For most of the history of beef production (before about 1950), steers were raised for both meat and fat, and sometimes beef cattle were used as draft animals. At that time, fat was very important in people's diets. Rendered fat from cattle is called tallow and was used in cooking before vegetable oils became popular. Tallow was also used for waterproofing leathers. Before tractors, oxen were used to pull plows or wagons.

Today, we raise beef cattle for meat production. Steaks, roasts, and hamburger are examples of beef meats you may be familiar with. Beef fat, or tallow, is currently not very valuable. Therefore, modern market steers are bred to maximize meat production and optimize body fat (see "Things you need to know" in Section 5). A certain amount of fat is necessary in market animals for the meat to be juicy and flavorful.

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

What Do We Call Cattle?

There are two scientific names for cattle. *Bos taurus* includes most beef and dairy breeds in the United States. *Bos indicus* are cattle with humps on their necks and long ears. They 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 bred specifically for meat production. A *calf* is any young bovine up to a year of age. *Feeder calf* is a term usually associated with calves that have been weaned but not yet placed in a feedlot.

Cattle have different names depending on their gender. *Heifers* are young female cattle before they have had their first calf. *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 Beef Industry in the United States

Traditionally, the beef industry has been segmented, which means that several different producers normally own an animal from birth to slaughter. The first owner of a market steer is a "cow-calf" producer who owns mother cows and sells calves each year after weaning. Unless you raise it yourself, your 4-H steer will most likely come from a cow-calf producer.

Beef cows consume mostly forages and are fed very little grain. They usually harvest their own feed from pastures during the summer months and eat stored forages such as hay (dried, baled grass) or silage (fermented grass or corn) in the winter. Cow-calf producers need access to large amounts of grazing land in order to feed their cows. Therefore, most large cow-calf operations are located where land is inexpensive or in warm climates where a long growing season allows grass to grow for most of the year.

States like Texas, Nebraska, and Florida are home to larger cow-calf producers, who typically own 300 to 1000 mother cows. Because land is more expensive in Pennsylvania and the growing season shorter, cow-calf herds are generally smaller here. A typical cow-calf producer in Pennsylvania owns fewer than 25 cows.

The second segment of the beef industry is called the *cattle feeding* segment. This part can be further divided into stocker feeders and feedlot producers. Stocker feeders, or "backgrounders," buy weaned calves and feed them low-cost forages for a short time. They then resell the calves to feedlot producers, who place the cattle on a high-grain ration until slaughter. Feedlot producers also buy weaned calves directly from cow-calf producers.

Most larger feedlots are in western states such as Texas, Nebraska, Kansas, Oklahoma, and Colorado. Large feedlots in these states have the capacity to hold 30,000 to 50,000 head of cattle. Pennsylvania feedlots are normally smaller than those found in the West. A typical Pennsylvania feedlot producer feeds 100 to 300 head of cattle at a time, although some Pennsylvania feedlots can house 600 to 800 head. You are acting as a feedlot producer by raising a 4-H steer from weaning to slaughter.

Recently, the beef industry has become less segmented. "Retained ownership" programs allow cow-calf producers to contract a feedlot (often in another state) to feed and market their calves.

Words You Should Know

Tallow: Rendered beef fat.
***Bos taurus, Bos indicus*:** Scientific names for domestic beef cattle.
Cattle or bovine: Generic term for all *Bos taurus* or *Bos indicus.*
Beef cattle: Cattle raised specifically for meat production.
Calf: Young cattle less than a year old.
Feeder calf: A weaned calf before placement in a feedlot.
Heifer: A young female bovine that has not calved.
Cow: A female bovine that has had at least one calf.
Bull: A male bovine that has not been castrated.
Steer: A male bovine that was castrated at a young age.
Stag: Improperly or incompletely castrated bull.
Castration: Removal of a male's testes.

Cow-calf producer: Cattle producer who owns mother cows and produces feeder calves every year.
Stocker feeder/backgrounder: Cattle producers who feed weaned calves an inexpensive forage (grass, hay, or silage) ration before putting them in a feedlot.
Feedlot producers: Cattle producers who feed feeder cattle or backgrounded cattle to slaughter weight on a high energy ration.
Ration: Mixture of feed given to an animal, usually daily.

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 name used for beef cattle.
- Name the two major products we get from a steer's carcass.
- Explain the difference between cow-calf producers, stocker feeders, and feedlot producers.

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.
- List all the cuts of beef you can think of.

Ideas for Presentations and Talks

- The history of domesticated cattle
- How the uses of cattle have changed
- Changes in the beef industry

Things to Talk About

- How will you react when your project steer is sold for slaughter?
- Why would cow-calf producers want to retain ownership of their calves through slaughter?

4 Breeds of Beef Cattle

Beef cattle come in many shapes, sizes, and colors. Those which are alike in their color patterns and body structure often belong to the same breed.

Objectives

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

1. Name examples of some of the major breeds of beef cattle raised in Pennsylvania.
2. Identify at least six major breeds by looking at photos or seeing live animals.
3. Identify and describe the important characteristics of your selected breed of beef cattle.
4. Name the breed of your project steer's sire and dam, or describe the traits that each parent breed possesses if your project animal is crossbred.
5. List some advantages of crossbred steers compared to purebred steers.

Major Breeds

Many breeds of beef cattle are commonly raised in Pennsylvania. Each breed has characteristics that help to distinguish it from other breeds.

Beef producers raise a particular breed of cattle because that breed has a combination of qualities that the producers want in their herds. For example, some breeds make exceptionally fertile, good mothers that milk well and wean heavy calves. Other breeds are heavily muscled and produce high-quality, meaty carcasses.

Cattle with black hides have a reputation among packers for producing desirable carcasses. Many breeds that were red or white in their original "fullblood" status have been bred for black hides in order to capitalize on this perceived advantage. Only three breeds listed in this reference guide (Charolais, Hereford, and Shorthorn) have not been bred black.

Some of the major breeds raised in Pennsylvania and their characteristics are listed below. There are over 100 recognized breeds of beef cattle. All breeds listed, with the exception of Angus, may be horned or polled (naturally hornless). Angus are always polled.

Breed Characteristics

Angus: English origin. Black or red, solid colored, always polled, known for maternal characteristics and producing high quality, well-marbled beef.
Brahman: Indian origin. Found in a variety of colors. Have distinctive long ears and loose skin. Tolerate heat and disease well.
Charolais: French origin. Solid white, fast growing, heavily muscled breed.
Chianina: Italian origin. Large framed, stylish cattle. Known for growth and leanness. Originally white in color with black pigmented skin but have been bred black.

Hereford: English origin. Red with white faces, feet, and often bellies and tails. Low-maintenance, hardy breed.
Limousin: French breed. Fullbloods are solid red, but black animals are popular. Known for producing heavily muscled carcasses.
Maine-Anjou: French origin. Originally red and white, but many are black. Large-framed, heavily muscled. Fast-growing and efficient in feedlot.
Shorthorn: English origin. Red, white, red and white, or roan. Good maternal breed. Known for producing high quality beef.
Simmental: Swiss origin. Large, heavily muscled, good maternal breed. Often have white faces.

Your Steer's Pedigree

A written record of the names of a calf's parents, grandparents, and other ancestors is called its pedigree. Here are some words you will see used on a pedigree, and their meanings:

Sire: The calf's father.
Dam: The calf's mother.
Grandsire: The father of the sire or dam (the calf's grandfather).
Granddam: The mother of the sire or dam (the calf's grandmother).

Registration of Purebred Cattle

Established breeds usually require that both parents be registered before their offspring can be registered. A registered animal's name, herd and registration number, date of birth, pedigree, and name of owner and breeder are recorded with the breed registry association. A steer must meet all of the association's requirements to be registered.

Breed registry associations issue registration certificates or papers to owners of registered beef cattle. When a registered animal is bought or sold, the seller must send the certificate back to the breed association so ownership can be transferred to the new owner. If you buy a registered animal, make sure the seller transfers the registration papers for you. If you plan to show the animal, make sure ownership is transferred to you before the show's ownership deadline.

Some breeds of cattle issue registration papers for cattle that are not purebred. For instance, a calf from a crossbred cow, sired by a purebred Maine-Anjou bull may be registered as 50 percent Maine-Anjou. A registered 50 percent Maine-Anjou heifer can be mated to a purebred bull and the resulting offspring can be registered as 75 percent Maine-Anjou, and so on. Typically, animals are considered purebred after reaching 87.5 or 93.8 percent. This "breeding up" process takes several generations, but it is how most new breeds are developed in the United States.

Fullbloods differ from purebreds. Fullbloods contain 100 percent of the genes from that breed and are the same color as animals found in the part of the world where they originated.

If you would like to find out more about a breed, you may write to the breed registry association. More information about breeds of beef cattle can also be found on the internet at **www.ansi.okstate.edu/breeds/cattle.**

Advantages of Crossbreds

Crossbred cattle have some advantages over purebreds because of heterosis. Heterosis is the improvement of trait in a crossbred over the average of its parent purebreds in the same trait. For example, if the average daily gain of Angus purebreds is 2.6 pounds per day and the average of Simmental purebreds is 3.0 pounds per day, we would expect the average daily gain of an Angus x Simmental crossbred to be 2.8 pounds per day. In reality, the average daily gain might be something like 2.95 pounds per day, which is higher than the average of the parent breeds. The improvement of the actual daily gain over the expected daily gain is a result of heterosis.

Heterosis affects several important traits in steers. In addition to an improved average daily gain, crossbred steers are usually more vigorous, have a bigger appetite, and resist disease better than purebreds.

Words You Should Know

Breed: A group of animals often having the same color patterns and body structure because they

American Maine-Anjou Association

This is to certify the pedigree of:

REGISTRY# 258932		CALVED 03/22/99	SEX S
NAME	MID-STATE FINESSE	%MA PB (87.50%)	HPS POLLED
TATTOO RE: MBM	LE: J04	HERD ID J04	CLR BLACK

BREEDER MID-STATE MAINES PA — BREEDER NUMBERS 350031

DATE OF OWNERSHIP PRESENT OWNER(S)
3/22/99 MID-STATE MAINES PA — 350031

SIRE: K&A'S AMTRAK A35 155880 (PUREBRED 6.25AN)
- K&AS COLBY Y129 137412 (PUREBRED 4.69XX 1.56AN)
  - JP MR CACHET 27U 127504 (PUREBRED 6.25XX) 17585
  - MISS K & A S434 95843 (PUREBRED 6.25AN 6.25XX) PB30453
- LJS MISS DRAFTPOWER 812X 129397 (PUREBRED 12.50AN)
  - SSF DRAFTPOWER U124 117664 (PUREBRED 3.13AN 3.13XX)
  - BGR DALTON 333G 67828 (75.00MA)

DAM: MID-STATE RAINELLE 220530 (75.00MA 14.60AN 10.70SM)
- JDS STOUT 147516 (PUREBRED 4.16AN 2.09XX)
  - POWER PLANT 84546 (PUREBRED 12.50AN) PBR51612
  - JDS SMITHBILTS ROXY 128687 (PUREBRED 6.25XX) B35831
- MID-STATE BANDITA 205693 (50.00MA 25.00AN 23.54SM 1.46)
  - SHILO TDR 02A 155735 (PUREBRED 3.13AN 3.13XX)
  - UNREGISTERED DAM

AMERICAN MAINE-ANJOU ASSOCIATION CORPORATE SEAL

ABOVE DESCRIBED ANIMAL HAS BEEN ACCEPTED FOR ENTRY INTO THE MAINE-ANJOU HERDBOOK, SUBJECT TO THE RULES AND BY-LAWS OF THE AMERICAN MAINE-ANJOU ASSOCIATION.

John Boddicker
EXECUTIVE VICE PRESIDENT

A purebred pedigree

share common ancestors selected for those characteristics.

Fullblood: An animal possessing 100 percent of genes from a certain breed. Some breeds allow only fullbloods to be registered.

Purebred: An animal possessing a high percentage (usually 7/8 or 15/16) of genes from a certain breed.

Crossbred: An animal with parents from different breeds.

Sire: An animal's father.

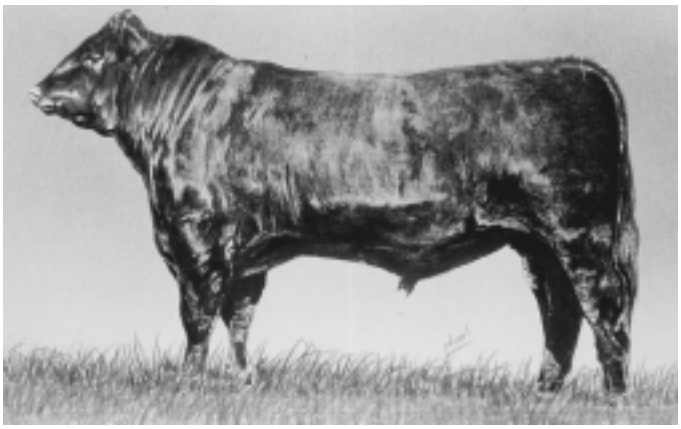
Dam: An animal's mother.

Heterosis: The percentage improvement (usually) of a crossbred over the average of its purebred parents in certain traits.

Polled: Naturally hornless.

Suggested Activities

- Answer the roll call at a meeting with the name of a major beef breed.



Angus

Shorthorn

Brahman

Hereford

Maine-Anjou

Chianina

Limousin

Simmental

Charolais

- Look through beef magazines to find pictures of different breeds of beef cattle. Make a poster or display using the pictures. Describe the special uses and features of each breed pictured.
- Visit a fair or show and try to identify the different breeds there. For crossbred steers, try to identify the breeds used in the cross.
- Write to the breed association to find out more about the breed of your project steer. Be able to describe what is special about the breed of steer you have chosen.
- Make a poster to promote or advertise your favorite beef breed.
- List some advantages (or disadvantages) of crossbreds compared to purebreds.
- Visit three breed association Web sites.

Extra Activities to Try

- Start a collection of model steers from different breeds or your favorite breed.
- Discuss with a producer which breed traits are important in a breeding program, and why they are important for a herd.
- Ask the manager or owner of a purebred cow-calf operation why he or she raises a particular breed of purebred cattle.
- Examine the registration papers of a registered beef animal. Be able to name the sire and dam.
- Ask the manager of a commercial cow-calf operation why certain breeds are used for cross-breeding.

Ideas for Presentations and Talks

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

Things to Talk About

- What are the major breeds of beef cattle raised in Pennsylvania?
- What characteristics are associated with each breed of beef cattle?
- What is a crossbred steer?

5 Selecting Project Animals

The conformation and size of steer you choose will affect the success of your project. Try to choose healthy, high-quality, lean, muscular, and structurally correct cattle. 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 what to look for when choosing animals for market steer projects.
3. Select a project steer based on projected frame size and finished weight.

Naming the External Parts of a Steer

It's important to know the words that beef producers use. 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 names 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 in the diagram on the next page. On a heifer or cow, you should also be able to identify the udder and vulva. On a bull, you should be able to find the scrotum and testes.

Things You Need to Know

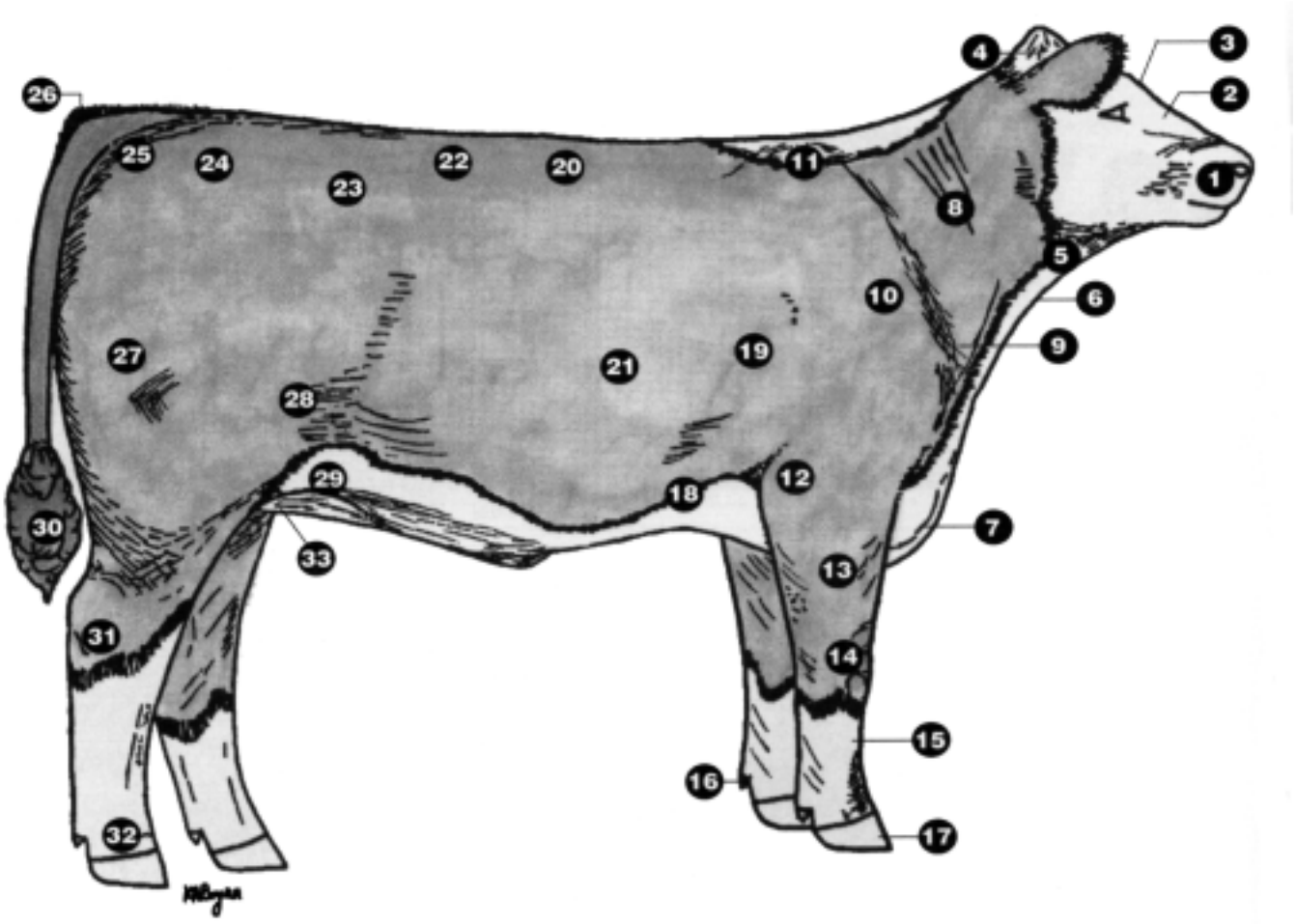
Before you select a feeder steer, you need to know and understand the three factors that influence the price paid for finished cattle.

The first factor is carcass weight. Ideally, packers prefer beef carcasses between 650 and 800 pounds. Carcasses of this weight produce steaks and roasts the size consumers want to buy. Normally, between 60 and 64 percent of the steer's live weight ends up as carcass weight, so live cattle between 1100 and 1350 pounds are most likely to produce carcasses in the preferred weight range.

The second factor 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 deposits laid over the ribs, back, and brisket are easily seen by looking at the steer. Shortly after external fat begins to appear, the steer deposits small amounts of fat inside the muscle tissue. This small amount of intramuscular fat is called marbling. It is what gives meat flavor and juiciness.

When a steer is slaughtered, its carcass is cut between the 12th and 13th rib, and the amount of marbling in the ribeye muscle is visually evaluated by a USDA beef grader. The grader also studies the degree of hardness (or calcification) of

EXTERNAL PARTS OF THE STEER



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

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 under 30 months of age, the carcass receives a USDA quality grade of "choice." Choice grade carcasses are usually more valuable, because consumers will pay more for meat that is juicy and flavorful. About 70 percent of steers with at least 0.4 inch of backfat have enough marbling to grade choice. Steers with 0.4 inch of backfat are said to be "ideally finished" and should have enough marbling to grade choice.

The third factor is yield grade. If steers deposit too much external fat or are too lightly 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 lightly muscled, fat carcass would receive a yield grade of 5.

You need four pieces of information to calculate yield grades of beef carcasses:

1. External fat thickness over the ribeye. Measured in tenths of an inch three-fourths of the distance from midline to bottom of the ribeye muscle between the 12th and 13th rib. This thickness may be adjusted up or down based on the relative fatness of the rest of the carcass.

2. Hot carcass weight in pounds.

3. Ribeye area. Measured in square inches between the 12th and 13th rib.

4. Kidney, pelvic, and heart fat percentage. Estimated as a percentage of hot carcass weight. Average is 3.5 percent.

Here is the exact formula for calculating yield grade:
2.50 + (2.50 x adjusted fat thickness) + (.20 x percent kidney, pelvic, and heart fat) + (.0038 x hot carcass weight, pounds) – (.32 x ribeye area, square inches)

Your task is to select an attractive, heavily muscled steer calf, then feed it so that it reaches an acceptable market weight (1100 to 1350 pounds) and external fat thickness (0.4 inch) on the day of the show.

Selecting Feeder Steers

You may choose to buy feeder steers from a reliable source or raise your own for your project. If you buy your calves, choose healthy steers that have the potential to grow quickly and efficiently.

When ready for slaughter, ideal market steers should be heavily muscled and adequately finished. They have wide, muscular loins, and thick, meaty quarters. Steers should be free of excessive fat in the brisket and at the sides of the tailhead.

For your project, select healthy feeder steers that are big for their age and that have sound feet and legs. Look for long, deep-bodied, long-fronted, well-balanced steers with level, muscular tops. High-quality calves walk easily and stand wide when viewed from behind. Look for well-balanced steers that are attractive from a side view. Steers should be castrated, healed, dehorned, wormed, and vaccinated (see Section 8). Also, try to select calm, easily handled feeder calves. Tame animals will make your halter breaking job much easier.

Steers for 4-H projects can be bought from different places. Many 4-H members buy steers from the farms of neighbors or other persons known to raise good-quality, healthy steers. Steers may also be bought at feeder steer auctions. Some people are paid to take orders for steers and buy them for other people. Look for calves from producers who have sold steers to other successful 4-H'ers. Try to buy calves from someone who can show you good records of the vaccinations, medications, and dewormers the steers have had before you buy them. Ideally, steers should be vaccinated and wormed three to four weeks before you bring them home.

How Big Should My Feeder Steer Be?

Really, this amounts to two questions: "How tall should my feeder steer be?" and "How heavy should my feeder steer be?" First, we need to calculate how tall your feeder calf should be. In

general, taller, larger-framed animals tend to finish at heavier weights—sometimes too heavy to fall into the preferred weight range of 1100 to 1350 pounds when ideally finished. Likewise, short, small-framed steers may be ideally finished at less than 1100 pounds. To avoid either extreme, you should select calves of "average" frame size for their age.

Use the table below to estimate the finished weight of a feeder steer by measuring its hip height and using its age. For example, an eight-month-old steer measuring 45 inches at the hip would be expected to finish somewhere around 1200 pounds. See Appendix 1 to learn more about frame scores.

Now for the question of how heavy your feeder calf should be. In the real world of beef production, beef producers try to get steers to market weight and ideal finish as quickly as possible. 4-H market steer projects differ somewhat from the real world of beef production because you are trying to get a steer to the correct weight (1100 to 1350 pounds) and ideal finish on the day of the show. The weight of steer you start with is closely related to the size of steer you end up with on show day. Here are four steps you can use to estimate what the beginning weight of your feeder steer should be.

Examples of medium-, small-, and large-framed steers (left to right)

The first step is to figure out how many days you will be feeding your steer from the day you buy it until show day. You may have to use a calendar to count the days. This feeding period is usually between 200 and 300 days. The second step is to estimate how fast your steer will grow. A moderately framed steer eating a balanced, high-energy diet will gain about 2.5 pounds per day. Generally, large-framed steers gain faster and small-framed steers gain slower. Daily gain can also be affected by genetics, health, and the amount and kind of feed you offer your steer.

The third step is to calculate the amount of weight your steer will gain during the feeding

Hip height (inches)	*Age (months)* 5	6	7	8	9	10	11	12
33	800	—	—	—	—	—	—	—
35	900	800	—	—	—	—	—	—
37	1000	900	850	800	—	—	—	—
39	1100	1000	950	900	850	800	—	—
41	1200	1100	1050	1000	950	900	850	800
43	1300	1200	1150	1100	1050	1000	950	900
45	1400	1300	1250	1200	1150	1100	1050	1000
47	>1400	1400	1350	1300	1250	1200	1150	1100
49	—	>1400	1450	1400	1350	1300	1250	1200
51	—	—	>1450	>1400	1450	1400	1350	1300
53	—	—	—	—	>1450	>1400	1450	1400
55	—	—	—	—	—	—	>1450	>1400

Estimated finished weight

period. This is done by multiplying the number of days in the feeding period by the amount of weight you expect your steer to gain each day. For instance, if you are feeding your steer for 250 days and you expect it to gain 2.5 pounds per day, your steer should gain 625 pounds.

The fourth step is to calculate the size of steer you should start with. Subtract the expected weight gain (625 pounds in this example) from the desired ending weight (1225 pounds). In this example, you should start with a steer weighing about 600 pounds (1225 – 625 = 600). Use the table on this page to estimate the size of steer you should start with.

Remember, these are only guidelines. Your calf may grow faster or slower than average. A few steers are capable of gaining over five pounds per day at times during the feeding period. You can adjust your steer's rate of gain by changing the ration. Also remember that your steer will lose about 40 to 50 pounds during the trip to the roundup. This weight loss during trucking is called "shrink." Don't be surprised if your steer weighs less when it gets to the roundup than it did at home.

	Feeder steer size (pounds)		
Days till show	*Large frame 1350 (3.0 ADG)*	*Medium frame 1200 (2.5 ADG)*	*Small frame 1050 (2.0 ADG)*
200	750	700	650
225	675	640	600
250	600	575	550
275	525	510	500
300	450	450	450

ADG = average daily gain

Deciding How Much to Pay

Farmers who feed and sell cattle for a living need to get more money when they sell their steers than it costs to raise them to market weight, 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.

(Left to right) Small-framed, heavily muscled steer; medium-framed steer with average muscle; and large-framed, lightly muscled steer

Before you purchase a feeder calf, you need to fill out a budget for your entire project. A sample budget can be found on page 24. To decide how much you can afford to spend on a feeder calf, first estimate what it will be worth when you will sell it. Subtract what you think it will cost to pay for feed (see "How much feed will my steer eat?" in Section 6 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.

Steers sold at 4-H auctions, especially champions, often sell for more money than steers sold at local sale barns or directly to packers. 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 years' average sale prices for steers (not including champions) bought from your junior livestock sale, you can use that as a basis for estimating income.

When You Get Your Steer Home

Before you get your steer home, find out if and how long it has been weaned. You'll also need to know if it is used to being around people. If your steer has not been weaned or seems afraid of people, keep it in a small area with good fences for the first two weeks until it gets used to eating and being around people. Do not turn a newly purchased calf into a large field with other cattle.

When you get your steer home, have plenty of good-quality grass hay available free choice. Find out if your calf had been fed grain before you bought it and try to duplicate that mix and amount of grain as closely as possible for the first few days. Then slowly switch to your grain mix. If your steer has not had grain before, offer only a

Nicely balanced project feeder steer

pound or two each day at first until it eats all of the grain, then increase the amount to three pounds per day. Increase grain gradually by three pounds each week until the steer reaches your desired feeding level. The steer should consume all of the grain within 30 minutes after feeding.

Almost all of the training required to show your steer correctly should be done at home before the roundup. Most of it should be done in the first two months you have your steer. When you first bring your steer 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 steers will come to see you as simply another part of their pen—and the provider of feed!

Soon after you get your calves home, you should begin halter breaking them. Begin by placing a halter on your calf with the lead end of the rope going under the steer's chin and exiting from the left side. You may need an adult to help you get a rope on your calf. It helps to have someplace to confine your steer during this process. Some people let their 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 your calf to a wall or solid fence for a few hours. (See Appendix 3 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 calves while they are tied. Do not leave a steer unattended that is not halter broken. Brush, pet, and talk to your steer. Let him know that you're not going to hurt him. Most calves will quit fighting the rope after a few of these sessions, but you have to tie them every day, or they will forget what they learned. If the rope begins to irritate the steer's chin, reposition the rope to a new location under the chin.

After the calves are used to being tied, start training them to lead. Start by trying to lead them to water after they have finished eating. Some calves don't want to go. It sometimes helps to have someone behind a stubborn calf to help get it moving. Other calves don't want to stop. It sometimes helps to have a second person on the halter with you to help slow the playful ones down. 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 middle of the backside of the ear. These pellets slowly release compounds into the bloodstream, increasing muscle deposition and improving feed efficiency in the animal. Since the compounds used in implants are related to those found naturally in cattle, they do not affect the safety of the beef produced by the implanted animal.

It appears, however, that implanted cattle have less marbling in the muscle than cattle that do not receive implants when both groups of animals are similar in frame size and fed to the same finished weight. Therefore, implanted cattle may have lower quality grades at slaughter. Also, although implants are completely safe, some consumers fear eating beef from implanted cattle.

If you choose to use implants to maximize growth rate, they can be reinserted at intervals specified by the manufacturer—usually every 60 to 90 days. To minimize possible negative effects on quality grade, however, it is probably best to avoid implanting steers within 100 to 120 days of slaughter. Also note that replacement heifers and bulls should not be implanted at all. If you've never implanted a steer before, have your leader or extension agent 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.

Feeding period: The time from when you buy your steer until the show—generally 200 to 300 days.
Sound: Free from structural defects.
Fed cattle: Finished steers or heifers ready for slaughter.
Marbling: Intramuscular fat used to determine quality grade.
Yield grade: A measure of how lean and heavily muscled a carcass is.
Quality grade: A grade based on the amount of marbling and age. Used to predict how juicy and flavorful the meat from a carcass will be.
Intramuscular fat: Small amounts of fat deposited within the muscle tissue.
Finished: Market weight cattle with at least 0.4 inch of backfat.
Shrink: Weight lost during trucking.
Free choice: Available for eating at all times.

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 steer using your knowledge of parts and desirable type.
- Visit a fair or show and listen to the beef judge give reasons for placing the steers the way he or she did.
- Visit a feeder steer auction to learn how steers are bought and sold or to look for steers that might make suitable project animals.
- Calculate how big your feeder steer should be, based on the dates of your show.

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 fed cattle prices each week for several months before the fair or roundup.
- 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
- What it costs to buy and raise a steer

Things to Talk About

- What are the main parts of a steer's body?
- What factors should you look for when choosing feeder steers for market projects?
- What is the normal weight of market steers when they are sold for slaughter?

MARKET STEER BUDGET

Receipts

Sell market steer	Weight ( ) x cents per pound ( ) = value	_____
Premiums		_____
Total receipts		_____

Expenses

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 (hay plus grain cost)		_____
Feeder steer cost		_____
Bedding		_____
Veterinary cost (including vaccines and medications)		_____
Supplies		_____
Transportation		_____
Marketing costs		_____
Entry fees		_____
Interest on borrowed money		_____
Other		_____
Total expenses		_____

RECEIPTS MINUS EXPENSES = PROFIT (OR LOSS) _____

6 Caring for Your Steer

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

Objectives

After studying the materials and completing the suggested activities for this section, 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 where you keep your calves and point out what you are doing to take care of them.
3. Calculate the amount of feed required to finish a market steer.

Housing Needs

Don't buy feeder steers until you have a good place to keep them. People are not allowed to keep farm animals in some areas, so find out the local regulations for the area where you want to keep your steer. Also find out any special laws or rules you must follow to care for your calf.

Make sure you have the right kinds of facilities and equipment to house and care for your steer. Cattle don't need fancy or expensive facilities to do well. Most 4-H'ers raise their calves in a pen or dry lot. For steers kept outside, a small shed or building with a sloping roof makes a good shelter. The building may have an open front, but it should have enclosed sides during fall, winter, and spring.

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

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

Steers don't grow well when they are too hot or too cold. Market steers are most comfortable and grow best when the temperature is between 45° and 60°F. Cattle have very thick hides and are designed to tolerate cold weather better than pigs, for instance. In extremely cold weather, steers will use a greater percentage of their feed to keep warm instead of growing. Provide straw or other bedding so your steer can lie in it and keep warm. Many 4-H beef club members tend to overconfine their market steers. Cattle can tolerate very cold conditions as long as they have a dry place to lie down and can get out of the wind.

During hot weather, steers breathe rapidly if they are too hot and grow more slowly because they don't eat enough feed. Provide shade to

keep your steer comfortable in summer. Exposing your steer to long periods of summer sun could cause sunstroke. A good, cheap source of shade for steers kept outdoors is a frame of poles covered with straw, cornstalks, or plastic feed bags. Trees give shade, too. During hot summer months, keep your calf in a well-ventilated shed during the day (use a fan if necessary), and turn it loose in a dry lot (with little or no grass) at night.

Keeping Your Steer Clean

Keep your steer's pen clean to reduce the chance of disease caused by filthy conditions and contaminated feed and water. A few beef barns are built in ways that keep manure from piling up in them. If yours is not, you will need to remove the manure from your pen daily to keep it clean.

If confined to a small pen that is not cleaned regularly, cattle accumulate manure in their hair coat—particularly on their rear legs. Bedding like straw helps to keep manure from accumulating. If your calf has manure attached to its hair, your pen isn't being cleaned often enough or you aren't using enough bedding.

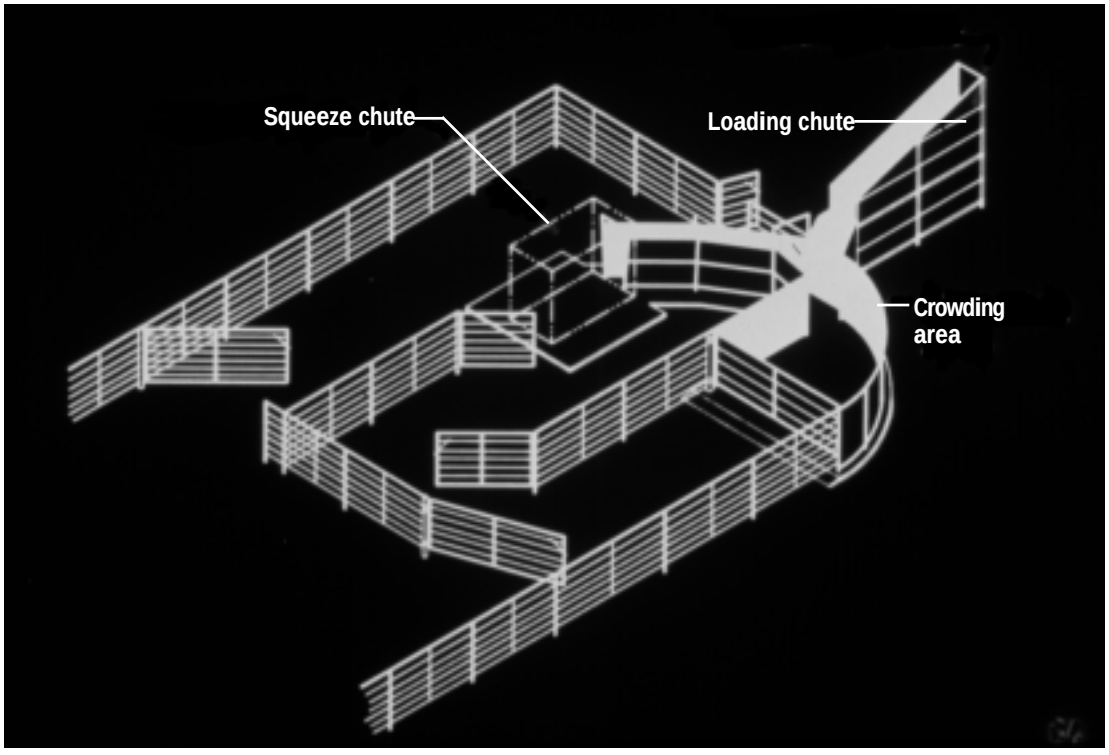
Cattle manure contains nitrogen, phosphorus, and potassium. All three nutrients are necessary for making plants grow. If you have a garden, you can use the manure your steer produces instead of buying commercial fertilizer. Large-scale cattle feeders are required to have a certified plan indicating where 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 steer.

Handling Equipment

In addition to finding a place to keep your steer, you will also need equipment to move, transport, feed, and water it. If your feeder calf is not halter broken when you buy it, you'll need a good unloading area to move your calf into its pen or lot. You can get loading chute designs from your extension agent. If you feel a loading chute is too expensive, have an area of the pen, barn, or lot where the steers can be cornered for easier loading and unloading. Moving steers on a stock

An example of sorting and loading facilities that might be used in a commercial beef operation



trailer generally makes loading and unloading easier because a ramp is not necessary.

Feeding Your Steer

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. You can also feed grain from a tray mounted on the side of the pen. Provide 20 to 24 inches of feeder space per calf. Keeping feed and water above floor level helps prevent steers from soiling their eating and drinking space. Left-over, stale, or soiled feed should be removed before each feeding.

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

Water is used by cattle 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 5 to 20 gallons daily depending on its weight, the outside temperature, and the type of feed you're giving. Change the water in watering pans or buckets at least twice each day.

The rest of the nutrients needed by growing cattle are found in solid feeds. Cattle have a four-part stomach that allows them to digest forages such as grass or hay along with grains. Some forage or hay must be included in the diet for a steer's digestive system to work correctly.

Nutrients in forages or grain include the following:

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 like 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 usually is present in hay and grain. Fat is sometimes added to commercial feedlot rations to increase the amount of energy the feed provides and thus to increase the steer's growth rate.

Cattle at an automatic waterer

Protein is used for making and repairing muscle. Soybean meal, linseed 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 steer diets or fed free choice.

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 a calf needs are found in the forages and grains they eat, but others must be added to the diet in a mineral mix or fed free choice.

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 or supplied in a free-choice vitamin and mineral mix.

Some ingredients commonly used in steer feeds are high-quality grass hay, lower-quality legume (alfalfa or clover) hay, oats, shelled corn, soybean meal, minerals, and vitamins. The grain, vitamins, and minerals usually are 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 it's usually best to give your steer baled hay to keep its digestive system functioning properly. Grain mixes should be coarsely ground.

If you follow directions carefully, the feed can be medicated. Lasalocid (Bovatec) or Monensin (Rumensin) are feed additives that help steers grow faster and more efficiently. They also prevent bloat and control coccidiosis caused by coccidia (see Section 8).

You may purchase commercial feed or make your own. The specific feedstuffs you choose for your steer depend on how fast you want your steer to grow and how quickly you want it to finish. The more energy you feed your calf, the faster it will grow and the quicker it will finish or deposit fat. Generally, diets that are extremely high in energy (mostly corn, with very little forage) are reserved for the last 60 to 90 days of the feeding period. Large-framed calves should be fed a high-energy (85 percent grain) diet for the entire finishing period, while calves with smaller frames can be fed a diet of 40 to 60 percent forage up until the last 60 to 90 days, when the energy content of the diet should increase. Alternately, smaller-framed steers can be fed a higher-grain diet, but the grain should have a lower energy content. Grains like oats are lower in energy compared to corn.

Below are some general guidelines to help you decide how much energy to feed your steer.

On the next page are some very simple diets with high, medium, and low energy levels. All diets are approximately 13 percent crude protein, and should be accompanied by good-quality grass hay fed free choice. Corn may be rolled or coarsely ground. The 34 percent protein supplement should be pelleted and should contain protein, vitamins, minerals, and Bovatec or Rumensin. Molasses (5 percent) can be included in each ration to help control dust and make the feed taste better.

Feeding period	*Over 1250 lbs finished wt.*	*1100–1250 lbs finished wt.*	*Less than 1100 lbs finished wt.*
Early (100 days)	High (13% protein)	Medium (13% protein)	Low (13% protein)
Mid (100 days)	High (12% protein)	High (12% protein)	Medium (12% protein)
Late (60–90 days)	High (11% protein)	High (11% protein)	High (11% protein)

High energy diet (13% crude protein)

Rolled shelled corn	80%
Oats	10%
34% supplement	10%
Total	100%

Medium energy diet (13% crude protein)

Rolled shelled corn	47%
Oats	47%
34% supplement	6%
Total	100%

Low energy diet (13% crude protein)

Oats	65%
Rolled shelled corn	30%
34% supplement	5%
Total	100%

Ask your leader for help if you're not sure what to feed.

Be careful that your calves do 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 there are wild cherry trees in or near your steer's lot, be sure to remove fallen branches promptly. Make sure your steer is kept away from any potentially dangerous plants. Ask your extension agent for more information on poisonous plants.

Starting Your Steer On Feed

Calves that have not been fed grain previously should be started slowly. At first offer calves three pounds of grain per day. Increase the amount offered by three pounds each week until you reach the desired feeding level. Increasing the amount of grain too quickly could cause your calf to go off its feed. If your calf suddenly stops eating its grain but appears otherwise healthy, reduce the grain by half and offer good-quality grass hay free choice for three or four days. Gradually raise the amount of grain again, but by no more than three pounds per week.

How Much Feed Will My Steer Eat?

Steers' eating habits are like those of people. Some eat a lot, and some not so much. Also, the bigger they are, the more they eat. A 500-pound steer may be able to eat only 12 pounds of feed (hay and grain combined) per day. A market-weight steer may gobble 25 to 30 pounds a day. Most steers average around 18 to 20 pounds a day over the entire feeding period.

One way to figure out how much your steer should eat each day is to multiply its weight by 2.2 percent (.022). This tells you the pounds of dry matter (not including moisture in the feed) that 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 .90.

For example, an 800-pound steer is expected to eat 17.6 pounds of dry matter (800 x .022). Converted to an as-fed basis, this means your steer will eat about 19.5 pounds of feed (17.6 pounds divided by .90). Generally, steers should be fed no more than 85 percent grain in the diet, so our 800-pound steer should eat no more than 16.5 pounds of grain per day (19.5 x .85).

You should 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 there are from purchase to show day. (See "How big should my feeder steer be?" in Section 5.)

Let's say for this example your steer needs to gain 600 pounds. A steer eats about 7 pounds of feed for every pound of weight it gains. So, if your steer needs to gain 600 pounds, multiply 600 times 7 to arrive at the total amount of feed your steer will eat while you own it. In this instance, the total is 4200 pounds of feed. If your steer is on a high energy diet for the entire feeding period (85 percent grain), then 85 percent, or 3570 pounds, of the feed it eats will be grain. The remaining 630 pounds will be hay.

You can also use feed intake to control your steer's weight gain. For instance, if you buy a small-framed steer that is heavier than it should

be, you can reduce the amount of grain so that your steer will gain less weight per day. When your steer gets back on track, you can resume normal feeding.

Monitoring Your Steer's Progress

You should also monitor your steer's rate of gain with a weight tape or scales at one- to two-month intervals during the entire feeding period to make sure the steer is growing at the correct rate. Increase the amount of grain fed and/or the energy level of the ration if your steer is growing too slowly. Decrease the amount of grain fed or the energy level if your steer is growing too fast.

To make sure you arrive at the show with a properly finished steer, have your leader or other qualified adult check your calf about 90 days before the show. That person can help you alter the ration or amount of grain fed to make sure your steer is finished correctly.

Exercise

Daily exercise builds muscle and helps keep people healthy. 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. Walking should be done in the morning or evening during hot summer days to prevent steers from overheating.

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?

Scales used for monitoring a steer's progress

_____ 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.

Ideas for Presentations and Speeches

• How I take care of my steer.
• My 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?

7 Observing Steer 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 steers because they can show you when they are okay and when they need you to do something for them. Steers 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, 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 the normal behavior of beef cattle with the behavior of other animals.

How Steers Behave

One of the most interesting things about steers 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'll notice in your steer is its "ruminating" or "cud chewing." When cattle eat forages like grass and hay, they swallow large pieces. Later, while they are resting, the large pieces come back 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.

A steer normally makes a "bawling" sound to call other cattle if it is 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. Sometimes if your steer is feeling good and has access to loose dirt, it may paw at the ground. Because steers are so heavily muscled and heavy for their size, they are not fast and they do not run as a dog would.

Steers have differing 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 and easily frightened, and run from people.

Steers normally lie on their stomachs with their legs curled underneath them. They may sleep for a few minutes on their sides with their legs straight out.

Some steers get excited very easily. Equipment and facilities should be designed to keep the animals calm and make them easier to move and handle. For example, loading chutes should have solid sides so that steers will not see things on the outside that could scare them. Cattle move easily around curved passages, but it is often difficult to get them to make sharp turns.

Steers prefer to move toward light and away from darkness. They do not like to walk toward moving objects and loud noises. They prefer not to step over obstacles like a garden hose or a door frame. They are suspicious and frightened of shadows in aisles and walkways.

Learn to recognize normal and abnormal urine and feces (manure) produced by your steers. Urine and feces may look or smell different when the animals are sick. The urine of normal steers is clear and yellow. Steers' feces look different depending on their diet. Feces of steers on a high energy diet are soft, with visible bits of grain. If your steer has loose, watery 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 do not look right, ask your parent or leader to take a look.

Also learn to recognize general signs that your steer isn't 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

Ethology: The study of animal behavior.
Bolus: Name for the forage that is regurgitated for rumination. Also called "cud."
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 to your parent or leader the different behavior you see.
• Attend a beef cattle show and observe the animals' behavior.
• Observe other farm animals or house pets and compare their actions to steers' actions.

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 steers sound or act as if something is wrong?

8 Keeping Steers Healthy

The success of any livestock operation depends on the health of the animals. Healthy, well-managed beef cattle will grow and produce efficiently. Disease in a beef herd can be costly, and can quickly destroy a herd.

Objectives

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

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

How Steers Digest Food

Perhaps you've heard that cows and sheep have four stomachs. Well, they do in a way. Actually, they have a stomach with four compartments. The first 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. It is why we call cows and sheep "ruminants." The second compartment is called the reticulum. It is partially connected to the rumen. Often "hardware" such as nails or wire the animal accidentally eats settle out in the reticulum.

The omasum is the third compartment. Here, a large amount of water is absorbed. The fourth compartment is called the abomasum, and it is nearly like the stomach of nonruminants.

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 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 Steers 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 steer's temperature.

You should learn to use a livestock thermometer to take your steer's temperature. Use one that has a loop on the end. Tie a string through

the loop so the thermometer will not be easy to "lose" 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 steer's temperature, place the thermometer into the steer's rectum and leave it there about three minutes before taking it out and reading it.

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

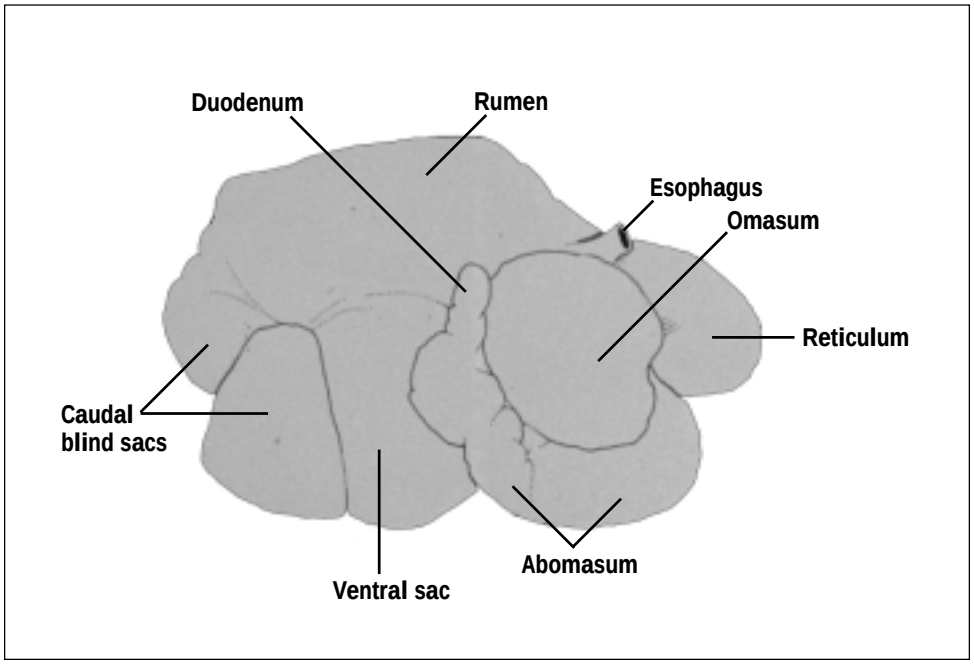
Coccidiosis sometimes causes steers to get diarrhea. Coccidia are actually tiny parasites found in the intestines of infected cattle. Steers can be fed ionophores (such as Rumensin or Bovatec) or coccidiostats to prevent coccidiosis.

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 major health problem involves **respiratory diseases**, those related to the steer's breathing. Respiratory disease 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 your calf's nose. Stress caused by trucking, poor ventilation, or changeable weather can all trigger respiratory disease.

Respiratory disease caused by the stress of trucking your steer home usually occurs within two weeks after arrival. Be especially observant for signs of respiratory disease during this period. This type of respiratory disease is commonly known as "shipping fever," which is neither a fever nor always associated with shipping of cattle. Germs that cause respiratory diseases can be carried through the air or picked up through nose-to-nose contact. Again, if you see any of these problems, ask your parent or leader for help.

THE RUMEN



To help prevent respiratory disease, your steer should be vaccinated for IBR, BVD, PI3, BRSV, *H. somnus,* and *Pasturella.* Your calf may have been vaccinated before you brought it home. If so, find out if it was vaccinated with a killed or modified-live vaccine. If your calf had only one dose of a killed vaccine, it will need a booster shot. If your calf has had no vaccinations, you can use a single dose of modified-live vaccine. See Appendix 2 for more information about respiratory diseases.

Another health problem for steers is caused by **internal and external parasites**. Parasites affect the digestive system or the skin. **Worms** are the main kinds of internal parasites. There are many different types of worms: they come in varying shapes and sizes. Some are visible only through a microscope, while others are large and look like spaghetti. Although worms rarely kill steers, 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 should be using 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. Plan to worm your steer as soon as you get it home and again in the spring.

Another internal parasite is commonly known as **cattle grubs or warbles**. These are the larvae of the heel fly. They 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 products such as ivermectin (Ivomec) or Dectomax, administered in early fall. Neither product 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 steers. The main thing these parasites do is drink the steer's blood, which can make your 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, these may be signs 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. It causes tissue decay and smells very bad. Steers usually develop a limp and swelling above the hoof. Foot rot can be treated with antibiotics or a topical treatment as recommended by a veterinarian. Overgrown hooves also can cause steers to limp. Generally, one hoof trimming several weeks before the fair or roundup is sufficient to keep overgrown hooves from becoming a problem.

Ringworm is a fungus that sometimes infects cattle housed indoors in the wintertime. If your calf gets ringworm, you will notice hair loss in circular patches anywhere on the body. It is important to detect and begin treating ringworm early. 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. 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, steers can get many other diseases. They may be contagious and passed from steer to steer and from herd to herd. Therefore, to maintain "biosecurity" (a disease-free environment), you should do the following:

• 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.

The most important thing to do to keep your steer healthy is to keep the steer and its pen clean. 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

Ruminant: An animal such as a steer that has a stomach with multiple compartments allowing it to digest forages.
Parasite: A living being that lives and gets its food in or on another living being called a host.
External parasites: Parasites, such as lice and mange, that cause problems on the outside of the steer.
Internal parasites: Parasites, such as worms, that cause problems on the inside of the steer.
Biosecurity: Practices to keep your steers from catching diseases from other steers, people, or the environment.

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.
• Keep a journal or barn chart about your steer's health.
• Find out what veterinary examinations and documents are needed to show a steer at a state show, such as the Pennsylvania Farm 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 they look normal.
• Have your parent or project leader check to see if the ventilation in your steer's pen is okay.
• 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 shortly after you buy it (if it was not wormed previously), and again in the spring if it has access to an outside lot.
• Set up a health plan for your herd.

Ideas for Presentations and Speeches

• The normal steer.
• Health problems steers can have.
• How to keep my 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 steers can have?
• How does a healthy steer act?

9 Beef Quality Assurance

Because of your 4-H market steer 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, it is your responsibility to ensure that the beef you produce is wholesome and safe.

Objectives

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

1. Name two ways antibiotics can be given to steers.
2. Tell why it is important to handle steers carefully.
3. List three things consumers evaluate before buying fresh beef.

Using Antibiotics

Things you do to a live steer can affect the safety of the beef it produces. Both injectable and feed grade antibiotics can help steers get over being sick. But if the steer is slaughtered before the antibiotics have had time to clear the animal's system, the beef produced by the treated steer could contain antibiotic residues. Antibiotic residues are illegal and can be a public health hazard.

Antibiotics in steer feed can also make steers grow faster and more efficiently. But because of consumer concerns about antibiotic residues, the National Cattlemen's Beef Association (NCBA) recommends that antibiotics not be fed for this purpose.

Antibiotics are species specific. Any antibiotics used on your steers must be labeled for use in feedlot cattle. The only exception is if the antibiotic has been prescribed by a licensed veterinarian.

Some antibiotics require a withdrawal time. This is the minimum time you must allow between when the antibiotic is given to the steer and slaughter. This period allows the antibiotic to clear 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. It is up to you as a beef producer to make sure you observe the proper withdrawal times for any antibiotics given to your steers. If an antibiotic has a withdrawal time, it will be listed on the label.

If you are using medicated feeds (those containing antibiotics), the withdrawal times are printed on the feed tag. For safety's sake, the feed you give to your steer for the last month or so of the feeding period should be completely free of medications. Check tags of medicated feeds fed earlier in the steer's life, because some feed grade medications have very long withdrawal periods. If you use medicated feed, write down what medication was fed, the level of medication in the feed, and the dates you started and stopped

feeding it. Again, the NCBA recommends that antibiotics not be included in cattle feed for growth promotion purposes.

Injectable antibiotics should be used only when a steer is sick, and then only under the supervision of a veterinarian. 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. Record any injections given, which steer it was given to, the date, and where you injected the steer.

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 region.

Treatment of Live Animals

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.

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, but there should be a reasonable amount of marbling sprinkled in the lean portion of the cut. Marbling makes the beef juicy and flavorful. Go to a grocery store and look at packages of fresh beef steaks. Observe the differences in marbling and color.

Marbling is controlled mostly by genetics, by length of time on feed, and by types of feed used. The amount of fat remaining on the outside of fresh beef is determined mainly 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, steers should be rested for several hours after unloading at the slaughter plant before being killed.

Beef Quality Assurance

You and all other parties who contribute to beef production—including dairy, veal, and 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.

Words You Should Know

Antibiotic: Substance fed or injected to improve growth rate or treat disease.
Quality assurance: Assurance to the consumer that beef is a safe and wholesome food.
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.

Ideas for Presentations and Talks

- Factors affecting beef quality
- Identifying good quality beef in the supermarket

Things to Talk About

- How do you make sure that the beef from your steers will be of high quality?
- What are some different definitions of beef quality?

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, you should be able to:

1. Plan for a steer 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. First, 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. However, you do not need to show your steer to complete the project requirements.

If you plan to show your steer, the first thing to do is get 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 the 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).

Besides continuing to feed, water, and keep your steer clean, there are several items you need to prepare for before the roundup.

Ethics

Ethics means "doing the right thing." It is your responsibility to behave ethically before and during 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.

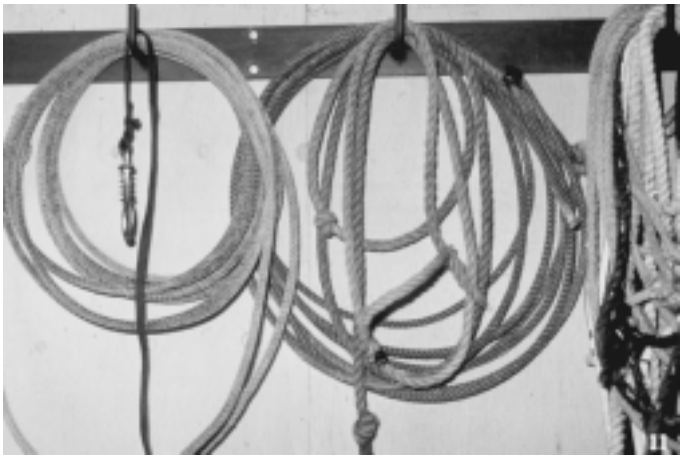
Many counties require roundup participants to sign a code of ethics before the roundup (see page 49). This code outlines ethically responsible behavior and practices, and has been used at the Pennsylvania Farm Show. It may be changed or updated, so make sure you have the most up-to-date copy available. Read the code and ask your leader to explain anything you don't understand. Ask yourself if you have followed the code of ethics while raising your steer.

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 your steer to the roundup.

You will have to buy some equipment in order to fit and show your steer. Maybe you could borrow some of it from your parent or leader, or share it with another 4-H'er. The following will be needed:

- Health papers
- Proof of entry
- Project book completed to date
- Water and a hose
- Feed pan
- Bucket
- Fan (if needed for hot weather ventilation)
- 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
- Show stick
- Neck rope
- Scotch comb
- Blocking chute
- Blower (optional)
- Electric clippers
- Extension cord
- Grooming adhesives and foams
- Adhesive remover
- Hoof coloring
- Clean rags
- Show clothes (check show rules for what to wear)
- Registration papers (if required)



Loading and Unloading steers

Well before the date of the roundup, arrange to have someone truck your steer to the roundup site. The vehicle (truck or trailer) used to transport steers should be well constructed, well ventilated, and properly bedded to keep steers 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 it gets wet. Give some thought to how you will load the steers. 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 get steers unloaded. 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

agent may check your project record book, so be sure it is up to date! Roundup officials will divide the classes based on steer breed and/or weight and will 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 from 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 from home. You can avoid this problem by adding some flavoring to the water at home for several days before the roundup, then adding the same flavoring to the water when you arrive at the roundup. Dry molasses works well.

You may also consider limiting the feed and water to half of what the steer normally gets before you leave home. That way your steer will be ready to eat and drink soon after he gets to the roundup. Even with all this extra preparation, sometimes steers will be excited by their new surroundings and may not eat or drink at first. You are now ready to begin final preparations for the show.

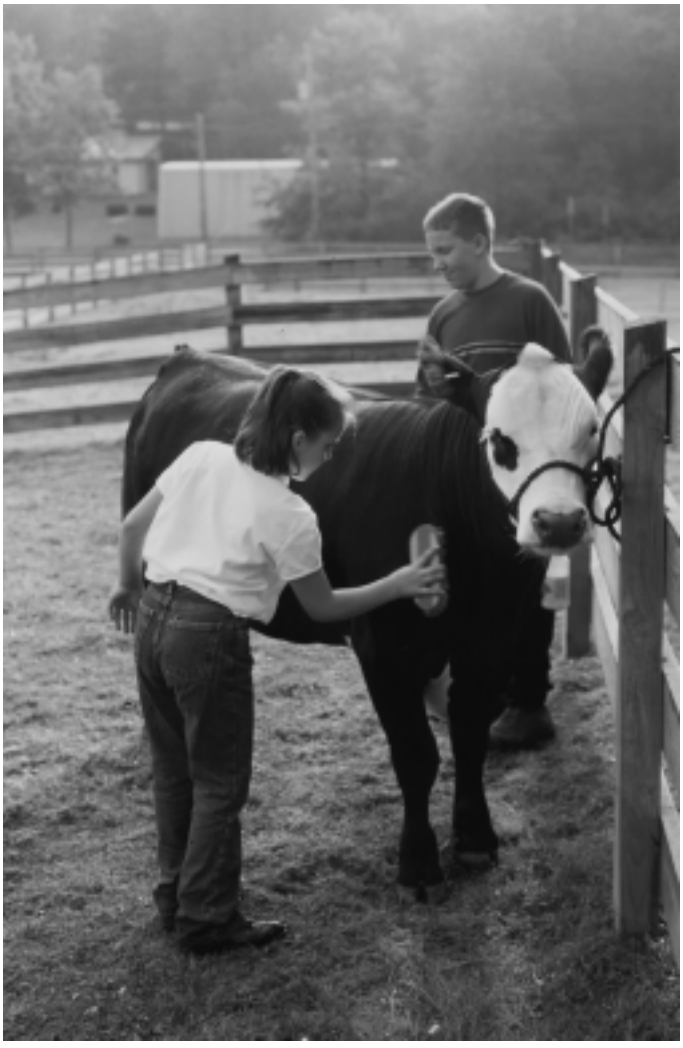
Fitting Your Steer

Your purpose in fitting your steer is to accentuate its good points and de-emphasize its not-so-good points. You are trying to make your steer appear more heavily muscled and more nicely balanced. You can do this by manipulating the animal's hair. The amount of hair your steer has depends on genetics, 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, some of the fitting techniques discussed here won't work very well.

Fitting begins at home well before the show. After your steer has gained your trust, begin training the hair by brushing up and forward, starting at the hock and brushing toward the top of the shoulder. There are products available to make training the hair easier and faster. In the end, you want the hair on the steer's body to stand upright like a carpet.

When the weather warms up in the spring, you need to make sure the old, dead hair 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 lies 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. 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, it's time to begin preliminary clipping, or "blocking." If this is your first steer project, get someone to help guide you and give you directions. If you've had steer projects before, you (not Mom, Dad, or a professional fitter) should do the clipping. There are four areas on the calf's body that 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. Some fitters leave the long hair at the top of the calf's poll to be pulled to a point. This is optional, and may be best left to more experienced fitters. 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 when clipping the neck. Blend in the line from the clipped portion to the unclipped portion. If you're clipping in a blocking chute, you'll probably need to back the steer out of the neck restraint to have access to the neck.

The tail should be clipped upward from a point toward the bottom of the twist to four or five 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 look trimmer middled.

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

About a month before the show, you should make arrangements to have your steer's hooves trimmed. During the winter, your steer's hooves

have grown—just as your fingernails grow. They should be trimmed before the show so that your steer stands and walks more correctly. You can trim the hooves yourself, but it's better to have them professionally trimmed to make sure they are done properly and to avoid injury to you or your calf. Some 4-H clubs schedule a day and place for all beef club members to bring their calves for hoof trimming.

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.

You'll also need to do two new bits of clipping. The first is to clip the steer's quarter. You do this to make the steer look wider and more heavily 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 clippers nearest the tail should be slightly closer to the skin than the outside edge of the clipper blade. Then clip 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're 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 wide when viewed from behind. Clipping the topline can be time consuming and is one of the most difficult clipping jobs.

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 want, you can use a "show foam" product to help hold up the hair on the steer's body. Pull or blow the hair up on the entire body.

Starting at the hoof, spray leg and tail adhesive on the legs and pull the hair up to slightly past the hock, or the point where the hair starts to stand up naturally. Pulling the hair up on the legs makes the steer appear more heavily boned. This process is called "boning." Some steers look better with unboned front legs. Use your clippers to even and shape the boned legs.

Next, use a small amount of adhesive to pull up the tailhead. Clip the tailhead to a 90-degree

angle when viewed from the side. The tail should be one side of the angle and the topline on the other side.

Clean any manure from the hooves and dewclaws with a wire brush or knife, then apply hoof dressing. If you left some hair on the calf's poll, pull up the topknot and spray with adhesive to hold it in place.

Put on the show halter, and get yourself cleaned up and ready for the show.

Showing Your Steer

Showing a steer is fairly easy. The best way to learn is by watching someone else do it. Work with an experienced show person, 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 the way you will need to.

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 its body, then pay attention to the judge while keeping the steer between you and the judge.

What will the judge be looking for in you and your steer? There may be three things:

- Type or conformation—how similar the steer is to the ideal animal for its purpose. For example, a class of market steers would be judged on their degree of finish, muscling, and structure.
- 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 training to lead 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 showstick. Practice using the show halter you plan to use on show day. To set the steer's feet, switch the halter from your right to left hand, and turn to face the steer. Place the steer's right rear foot squarely under the 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 showstick 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. It takes a lot of practice and repetition to teach your steer how to set its feet properly.

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, the judge may want to handle your steer to determine the amount of finish. Be courteous and allow the judge access to your calf. Warn the judge if your steer kicks. Use your scotch comb to reposition the steer's hair after the judge handles your calf. Practice by having a parent, sibling, or other 4-H member handle your steer at home.

Your job during the show is to present the steer to the judge. You'll need 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'll also need 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. Steers 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 handles your steer.

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 steer, 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 steer 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, 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. This will help you 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 persons 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 all the 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 persons. Even if you don't win, be proud of what you did accomplish. Most important, have fun and think about all the things you learned about yourself and about market steers 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 to 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 you are approached by someone who 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 steers are sold. Often, steers sold at junior livestock sales bring more than the current market price. Buyers may purchase steers for many reasons—as an advertisement for a business, as a "thank you" for doing business with them, as a source of freezer meat, or simply as a way to help young people. If you elect to participate in the sale, you (not your parents, leaders, or county agents) need to do some work ahead of time to ensure that your steer will receive the best possible price. Remember, marketing is an extremely important part of the beef cattle business!

First, find out the rules for your sale. How many steers can you sell? What, if any, commissions are charged? Is trucking available for buyers to send steers to local custom butchers? 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 packer or livestock market has agreed to pay the current market value for steers 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 who attend the sale specifically to bid 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 of anyone who is 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, how it works. If your county has a buy-back program, make sure buyers realize they do not have to take the steer 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!

Buyer contact should first be made a month or so before the roundup. Follow up with a phone call within a week of the sale to remind buyers of the date, place, and time. Expect some people you contact to decline to participate. That's OK; at least you asked! Also, tell prospective buyers that most of all you want them to come and support the junior livestock sale. Second, you would like them to bid on your steer.

On sale day, try to look up your buyers before the sale starts and thank them for coming. Immediately after the auctioneer pronounces your steer "sold," listen carefully for the name of the buyer. Tie your steer, 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 they 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 steer 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 steer for show day
- Equipment needed to show a steer
- How to fit a steer
- Your experiences showing a steer
- Contacting buyers for a sale

Things to Talk About

- What steps must you take if you want to show your steer?
- How do you show a steer in a ring?
- What equipment do you need to fit and show steers?
- How does a good show person act?

Year	*Event*	*Buyer Name*	*Buyer Address*	*Buyer Phone*	*Price*

CODE OF ETHICS

Exhibitors of animals shall at all times deport themselves with honesty and good sportsmanship. Their conduct in the competitive environment shall always reflect the highest standards of honor and dignity to promote the advancement of agricultural education. This code applies to junior as well as open class exhibitors who compete in structured classes of competition. This code applies to all livestock offered in any event at the livestock show.

All youth leaders working with junior exhibitors are under an affirmative responsibility to do more than avoid improper conduct or questionable acts. Their moral values must be so certain and positive that those younger and more pliable will be influenced by their fine example. Owners, fitters, trainers, and absolutely responsible persons who violate the code of ethics will forfeit premiums, awards and auction proceeds and may be prohibited from future exhibition. Exhibitors who violate this code of ethics demean the integrity of all livestock exhibitors and should be prohibited from competition at all livestock shows in the United States and Canada.

The following is a list of guidelines for all exhibitors and all livestock in competitive events:

1. All exhibitors must present upon request of show officials, proof of ownership, length of ownership, and age of all animals entered. Misrepresentation of ownership, age, or any fact relating thereto is prohibited.

2. Owners, fitters, trainers, or absolutely responsible persons shall provide animal health certificates from licensed veterinarians upon request by show officials.

3. Junior exhibitors are expected to care for and groom their animals while at the show.

4. Animals shall be presented to show events where they will enter the food chain free of violative drug residues. The act of entering an animal in a livestock show is the giving of consent by the owners, fitters, trainers, and/or absolutely responsible persons for show management to obtain any specimens of urine, saliva, blood, or other substances from the animal to be used in testing. Animals not entered in an event which culminates with the animal entering the food chain shall not be administered drugs other than in accordance with applicable federal and state statutes, regulations, and rules. Livestock shall not be exhibited if the drugs administered in accordance with federal and state statutes, regulations and rules affect the animal's performance or appearance in the event.

If the laboratory report of the analysis of saliva, urine, blood, or other sample taken from livestock indicates the presence of forbidden drugs or medication, this shall be prima facie evidence such substance has been administered to the animal either internally or externally. It is presumed that the sample of urine, saliva, blood or other substance tested by the approved laboratory to which it is sent is the one taken from the animal in question, its integrity is preserved and all procedures of said collection and preservation, transfer to the laboratory, and analysis of the sample are correct and accurate and the report received from the laboratory pertains to the sample taken from the animal in question and correctly reflects the condition of the animal at the time the sample was taken, with the burden on the owner, exhibitor, fitter, trainer, or absolutely responsible person to prove otherwise.

At any time after the animal arrives on the show grounds, all treatments involving the use of drugs and/or medications for the sole purpose of protecting the health of the animal shall be administered by a licensed veterinarian.

5. Any surgical procedure or injection of any foreign substance or drug or the external application of any substance (irritant, counterirritant, or similar substance) which could affect the animal's performance or alter its natural contour, conformation, or appearance, except external applications of substances to the hooves or horns of animals which affect appearance only, and except for surgical procedures performed by a duly licensed veterinarian for the sole purpose of protecting the health of the animal, is prohibited.

6. The use of showing and/or handling practices or devices such as striking animals to cause swelling, using electrical contrivance, or other similar practices are not acceptable and are prohibited.

7. Direct interference with the judge, show management, other exhibitors, breed representatives, or show officials before, during or after the competitive event is prohibited. In furtherance with their official duty, all judges, show management, or other show officials shall be treated with courtesy, cooperation, and respect and no person shall direct abuse or threatening conduct toward them.

8. No owner, exhibitor, fitter, trainer, or absolutely responsible person shall conspire with another person or persons to intentionally violate this code of ethics or knowingly contribute or cooperate with another person or persons either by affirmative action or inaction to violate this code of ethics.

9. The application of this code of ethics provides for absolute responsibility for the animal's condition by an owner exhibitor, fitter, trainer or participant whether or not he or she was actually instrumental in or had actual knowledge of the treatment of the animal in contravention of this code of ethics.

10. The act of entering an animal is giving consent by the owner, exhibitor, fitter, trainer, or absolutely responsible person to have disciplinary action taken by the show management for violation of this code of ethics. The act of entering an animal is giving consent that any proceedings or disciplinary action taken by the show management may be published with the name of the violator or violators in any publication of the International Association of Fairs and Expositions, including Fairs and Expositions and any special notices to members.

11. The act of entering of an animal in the show is the giving of verification by the owner, exhibitor, fitter, trainer, or absolutely responsible person that he or she has read this code of ethics and understands the consequences and penalties provided for actions prohibited by the code. It is further a consent that any action which contravenes these rules and is in violation of federal and state statutes, regulations, or rules may be released to appropriate law enforcement authorities with jurisdiction over such infractions.

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 win an award or a college scholarship.

Objectives

After studying the materials and completing the suggested activities for this section, 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 prove what was done and help make decisions. Good records can tell you if your steers are costing or earning you money. They can be used to tell you if your calves are growing as fast as they are 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 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's 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 you use to care for them. Include costs of feed, supplies,

equipment, animals, 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 track how individual animals grow and use their feed. To keep performance records, you need to identify your animals with a tatoo or ear tag. Write down the identification number, date of birth, and sire and dam of each steer, if these are known. 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. Other good times to weigh steers are times when you will be doing other things to your steers, such as weaning, deworming, or vaccinating them. You should know how much your steers weigh to calculate the dosage for some dewormers or medicines. Record the weight of your steer at each weighing.

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 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.

On the opposite page are some average market steer performance traits. Compare your steer's performance with the averages.

These guidelines are not based on any particular resource. They are simply numbers showing how "average" steers have performed. 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 steer projects. These are records of how many calves or other products an animal produces. They include dates when a cow calves and her calf is weaned. They may also include the performance of her progeny. Other kinds of production records kept for animals other than cattle are amounts of milk, wool, or eggs produced. Since market steers don't produce any products other than their carcasses at slaughter, you won't need to keep production records for them.

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

	Average	*Range*
Calves weaned per cow exposed	.85	.75–95

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.

MARKET STEER PERFORMANCE TRAITS

Feed consumed per day	*Average*	*Range*
600-pound steer	16 pounds	12–20 pounds
900-pound steer	21 pounds	15–28 pounds
1,200-pound steer	24 pounds	18–32 pounds
Feed eaten per pound of weight gain	7.0 pounds	5.5–8.5 pounds
Total feed required from 600–1,250 pounds	4,550 pounds	3,575–5,525 pounds
Average daily gain 600–1,250 pounds	2.5 pounds per day	1.5–4.0 pounds per day

Carcass traits for 1,225-pound steer	*Average*	*Range*
Slaughter weight	1,225 pounds	1,100–1,350 pounds
Average backfat (last rib)	0.4 inch	0.1–0.8 inches
Ribeye area (last rib)	13.0 square inches	10.0–16.0 square inches
Yield (dressing percent)	62.5%	60.0–65.0%

Some performance traits of breeding cattle are listed below. While they don't deal specifically with your project, you need to know some of these numbers.

Breeding cattle performance traits	*Average*	*Range*
Gestation length	283 days	269–297 days
Length of estrus cycle	21 days	18–24 days
Age at first estrus	10 months	7–13 months
Weight at first estrus	750 pounds	600–900 pounds
Length of estrus (heat)	8 hours	4–20 hours
Weaning age	205 days	170–240 days
Time from calving until first estrus	45 days	30–75 days
Cows served per yearling bull	10	—
Cows served per 3 year old bull	40	—

Keep records of dates when you buy and sell steers, or when a steer dies. Other dates to write down are those 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, and why you treated the animal. These records are important for beef quality assurance.

Your 4-H Accomplishment Records

In addition to the records you keep about what you do with your steers, there are other kinds of records to 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 steers received.

Words You Should Know

Financial: Related to money
Income: Money someone else pays to you
Expenses: Money you spend for products or services
Profit: Money you keep when your income is more than your expenses
Loss: Money you lose when your expenses are more than your income
Estrus: The period of time when a heifer or cow can be successfully mated
Gestation: The time of pregnancy between mating and calving

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

Extra Activities to Try

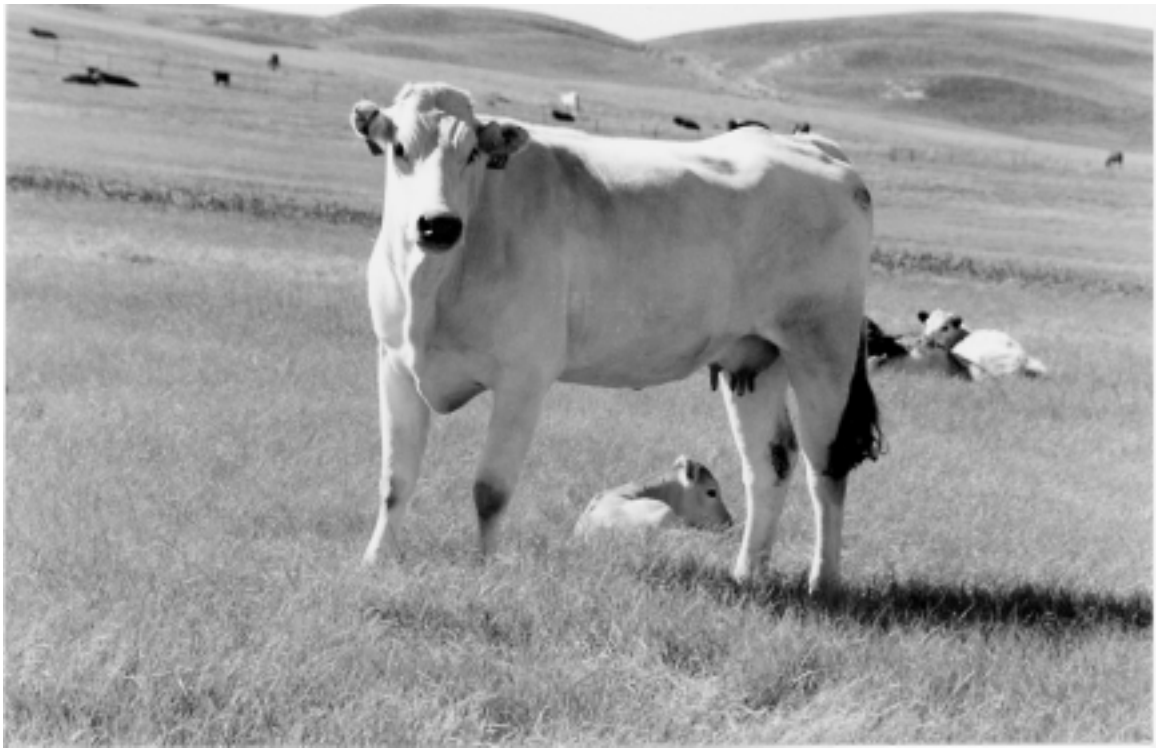
- Weigh a project animal more than once. Calculate how much it gained and its average daily gain. Compare with the listed averages.
- Discuss how to use your records to make decisions about managing your project. Do this with your leaders and members of your club.
- Calculate the efficiency of feed conversion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

Ideas for Presentations or Talks

- Kinds of records to keep on your steers
- 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 kinds of information belongs in your 4-H market steer record?
- How can you use your 4-H steer records to make management decisions about 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, 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 by-products of 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 it 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 it 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 for bone formation and for helping the body to 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 key minerals people get from eating beef. Beef doesn't provide all the nutrients people need, so we must eat other kinds of food, too.

Meat from different parts of an animal's body has 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 or made into hamburger.

Other Products from Beef

Leather from the hide is an important by-product. The leather is used to make products like shoes,

coats, furniture covers, and many others. Other by-products include health care products such as insulin and tallow. Pet foods are made from by-products of beef processing.

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

Words to Learn

Processing: The act of cutting carcasses and making them into products that can be sold
Nutrients: Chemicals in foods that humans and animals use to help support life
Protein: A complex nutrient the body uses to make muscle
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 beef by-products. 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

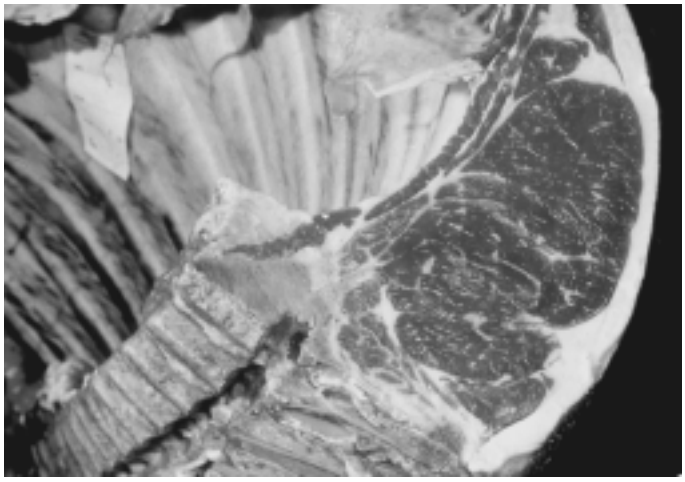
• Visit a grocery store or look through the cabinets and refrigerator in your home to find products that come from cattle. Make a list and share it with your parent or leader. Don't forget to include products made with beef by-products.
• Prepare a favorite recipe that includes beef, and serve it to 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 Market Steer Management Schedule

Plan

Buy six- to ten-month-old feeder steers weighing 450 to 650 pounds. Market them when they are 14 to 17 months old and weigh 1100 to 1350 pounds. Dates will change depending on the dates of your show.

Assumptions

Steers will eat an average of about 18 pounds of feed (less at first, more later) each day from a self-feeder and will gain an average of 2.5 pounds each day.

Enter the dates for your schedule in the table below. Your dates will vary from the sample ones, depending on the dates of your show.

Steer weight	*Activity*	*Sample dates (show date: Aug 15)*	*Dates for your project*
Less than 450 pounds	Plan project.	Aug-Sept	
	Arrange project financing.		
	Get barn and pens ready for steers.		
	Make sure feeders and waterers are ready to use.		
	Arrange to buy feed and bedding.		
500 pounds	Buy steer.	Oct 30	
	Keep new steers away from other cattle at least three weeks.		
	Vaccinate and deworm steers, if not done before purchase.		
	Ear tag, if appropriate.		
	Check steers for lice and mange. Treat if needed.		
	Start steer on feed slowly.		
	Write steer weights and prices in record book.		
	Begin halter breaking and leading process.		
Under 800 pounds	Weigh steers at county weigh-in, if required.	Dec 31	
800 pounds	Reduce crude protein to 12%.	March 1	
	Weigh steers and calculate average daily gain. Evaluate and compare to target.		
	Deworm steers.		
900 pounds	Begin rinsing and introduce show stick.		
	Consider body clipping your steer.	April 1	
	Have veterinarian do appropriate health tests and send for health papers.		
	Investigate taking your steer to a summer preview show. (Be sure to meet health requirements in plenty of time.)		

(continued)

Steer weight	*Activity*	*Sample dates (show date: Aug 15)*	*Dates for your project*
900 pounds, continued	Order new show equipment, if needed.		
	Start recruiting buyers.		
	Weigh steers and calculate average daily gain.		
	Evaluate and compare to target.		
1050 pounds	Have leader evaluate finish on your steer and recommend feeding changes.	June 1	
	Reduce crude protein to 11%.		
	Weigh steers and calculate average daily gain.		
	Evaluate and compare to target.		
1150 pounds	Do preliminary clipping.	July 1	
	Make arrangements to have hooves trimmed.		
	Make trucking arrangements for the roundup.		
1250 pounds	Show and sell steers.	Aug 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.		

APPENDICES

Appendix 1: Frame Scores

In Section 5 of this reference guide is a table that uses hip height and age to project the finished weights of steer calves. This table is based on frame scores.

Frames scores are assigned to cattle of all ages to help project finished and mature weights based on age and measured hip height. Scores are on a scale of 1 (extremely small frame) to 10 (extremely large frame); they can be reduced to tenths of a frame score (for example, a frame score of 5.8). Generally, cattle with frame scores of 1 through 5 are considered to have a small frame. Scores of 6 and 7 are considered moderate. Frame scores of 8 and above are considered large.

You may encounter either frame scores or mature hip height in semen catalogs for beef sires. Following is a table you can use to convert the mature hip height of bulls to frame scores.

Hip height (inches)	*Frame score*
50	4
52	5
54	6
56	7
58	8

Appendix 2: Respiratory Diseases of Cattle

The most common respiratory diseases are often called "bovine respiratory disease complex" (BRDC), also known as shipping fever. Normally, cattle with respiratory disease also have two or more viral and / or bacterial infections. The specific viral diseases 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 of an animal infected with a viral disease.

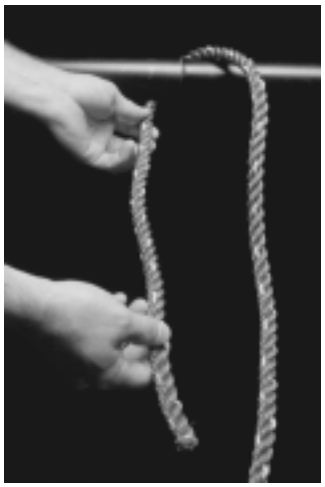
You can have your cattle vaccinated for IBR, BVD, PI3, and BRSV by using either modified-live vaccines or "killed" vaccines.

Genetically altered, modified-live vaccines for all four diseases can be blended in one vaccine, or you can buy each one separately. Modified-live vaccines need only be given once for protection against disease, but subsequent immunizations increase the animal's ability to resist infection.

Killed vaccines (blended or individual) must be given to an animal at least twice (at two- to four-week intervals) before they effectively prevent disease. If you buy killed and modified-live vaccines blended together, a booster shot is necessary to provide full protection.

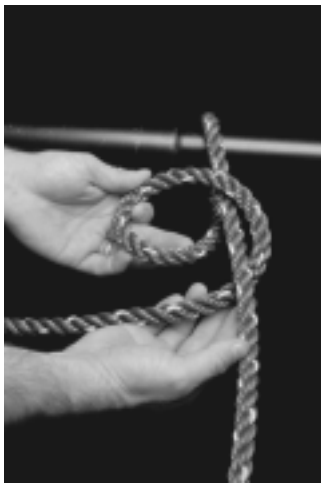
Vaccines for *hemophilus* and *pasturella* can also be bought together or separately. They require an initial dose followed by a booster two weeks later.

Appendix 3: How to Tie a Quick-Release Knot

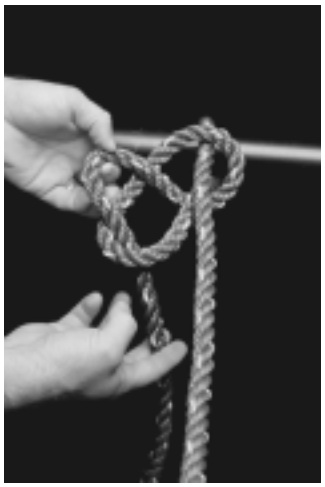


1. Pass the free end of the rope around or through the object to which you want to tie your steer.

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



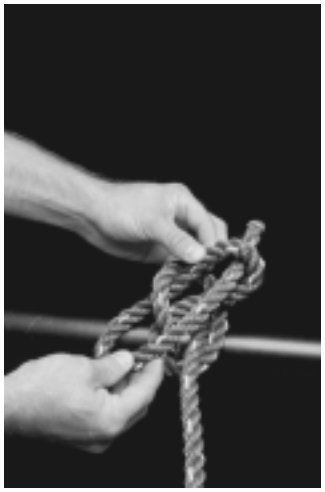
3. Flip the free end toward the tying post to make a loop.



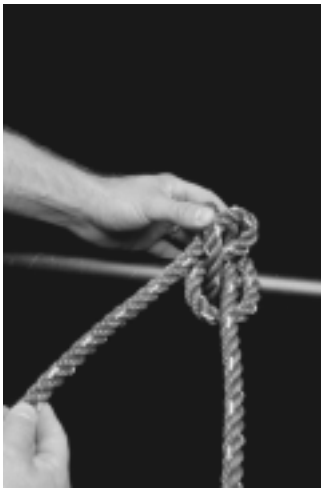
4. Pull a portion of the free end through the loop. In other words, pull a loop through the loop.

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 4: Where to Go for More Information

1. Beef cattle resources on the Web:

http://www.showsteers.com
http://www.beef.org
http://www.beef.org/library/handbook/index.htm
http://www.cattlepages.com
http://www.ansi.okstate.edu/library
http://www.dpi.qld.gov.au/dpinotes/animals/cattle/cattle.html
http://www.ansi.okstate.edu/library/Cattbeef.html
http://cowcalfcorner.okstate.edu/archive.htm

Add your own:

2. Beef breed listings on the Web:

http://www.ansi.okstate.edu/breeds/cattle
http://www.ars-grin/cgi-bin/npgs/animal/specieslist.pl

3. Pennsylvania 4-H home page:

http://www.cas.psu.edu/docs/pa4h/pa4hhome.html

4. Other beef information:

Ohio State 4-H beef learning labs—
Curriculum Materials Service
The Ohio State University
254 Ag. Admin. Bldg.
2120 Fyffe Rd.
Columbus, OH 43210

http://ad254-5.ag.ohio-state.edu/ocms

Authors

Prepared by Robert E. Mikesell, senior extension associate, Robin B. Keyser, assistant professor of agricultural and extension education, Patrick J. Carroll, graduate extension assistant, Ronald J. Knox, graduate extension assistant, and Kenneth P. Kephart, associate professor of animal science, in consultation with the Pennsylvania 4-H Animal Sciences Curriculum Development Committee.

Committee Members

Members of the committee involved with the initial drafting of this manuscript were Robin Keyser, William Henning, Dale Olver, Herbert Jordan, Chester Hughes, Deborah Dietrich, Patricia House, Gere Reed, Bruce Loyd, Patsy Novak, Patricia Comerford, Gary Dean, Denise Pease, Nancy Plushanski, Shannon Davis, Alice Strause, and Penny Farmery.

Committee members who helped to finalize the document were Keith Bryan, Kenneth Kephart, Norma Lash, Ruth Burns, Sherri Abruzzi, Chester Hughes, Nancy Kadwill, Donna Zang, Missy Whetzel, Patricia Comerford, Marianne Fivek, Bob Lewis, Dale Olver, Bill Weaver, and Christy Kohler.

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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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