

Your 4-H Market Beef Project

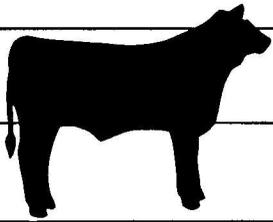
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Credits

This publication was written by Kenneth Geuns, Extension Livestock Youth Specialist, Department of Animal Science, Michigan State University.

The publication was edited by Susan Malott, former 4-H Publications Editor, and Rebecca McKee, 4-H Publications Editor. It was designed and illustrated by Marian Reiter, 4-H Graphic Artist.



Beef Quality Assurance

Most beef producers understand the value of learning about beef selection, showmanship, management and health care. Even more important than acquiring these skills is taking the responsibility to provide a product that people want to buy.

Quality Time After Time

Consumers want the beef they buy next week in the grocery store to be as good as the beef they bought this week. They want to select from a consistent product in the meat case. Practicing quality assurance means making sure there are no harmful residues in the beef products you market. It is the bridge that links the responsibilities of production and marketing. Every beef producer must accept the responsibility of consistently providing quality beef products.

Residue avoidance is an important part of a beef quality assurance program. Many organizations, including consumer groups, government agencies and beef producers, are interested in the production of residue-safe beef products. If you want to be a successful producer, you need to make the practice of avoiding residue an essential part of your production and marketing strategies. Know the medications you use and withdrawal times, how to properly mix feed and deliver it, how to identify treated cattle and how to manage feeders and pens

to minimize residues. The National Cattlemen's Association has additional information on quality assurance programs.

What Is a Residue?

You may gain a clearer understanding of what a residue is by imagining yourself drinking a glass of milk. If you finish the glass of milk and fill it again with water without rinsing it, your water will be cloudy. That is because milk residue is left in the glass.

A residue is the amount of a substance that remains in an animal's body tissue after exposure to that substance. The substance can enter the animal's body when it is used as a feed or water additive, as an injectable or external treatment, or by accident. Some substances may leave an animal's body tissues a few hours after exposure, others may leave in several months, and some may never completely leave certain tissues. Low-level drug residues are not physically harmful to humans, but may cause loss of confidence in the quality of the food products.

Why the Concern?

It is illegal to adulterate a food substance. This is why the U.S. Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) have set strict guidelines to protect our food supply. Random tests at slaughter

facilities can indicate which producers aren't following regulations. If illegal levels of residue are found in the tissue of a slaughtered animal, the USDA can stop a facility from accepting beef cattle from that producer until the herd tests safe from residue. This loss of a market can cause great economic concern for a beef producer.

Perhaps the worst consequence of not obeying withdrawal guidelines is that it can cause consumers to lose confidence in beef. Consumers are increasingly health conscious. They demand that their food be lean and wholesome. Some consumers are concerned that certain people may develop severe allergic reactions if traces of medications are present in meat. Although this is not likely to happen, it's important that residue in animal products be kept below FDA levels.

How You Can Prevent Residue Problems in Your Animals

Not all medications pose a potential residue problem. Withdrawal times listed on labels tell you when to remove medications to prevent illegal residues. The withdrawal time is when the medication must be removed from a steer before it is slaughtered. The time varies from one day to several months, depending on the type of medication.

Most medications leave the body by way of the urine and feces at a predictable rate. This rate is called a half-life, which is the length of time it takes a substance to reduce its concentration by one-half. Every medication has a different half-life. Once a medication is taken away completely, its half-life countdown begins. Withdrawal times are based on half-life rates.

If you don't completely withdraw medications, half-life values will increase and withdrawal times will be longer. To prevent withdrawal times from increasing, be sure to properly manage feed additives and feed mixing and handling systems so feed isn't accidentally contaminated.

Carryover of medications in feeders, bulk bins, auger systems, feed mixers and manure can cause residue problems. Giving too much medication, or giving injectable products improperly, also will lengthen withdrawal times. Contamination of livestock water systems may extend withdrawal times after water medication. Monitor all chemicals that your calf comes in contact with. Products used for the control of rodents or external parasites may contaminate a steer's feed supply or environment and cause residue problems in beef unless precautions are taken.

Points to Remember

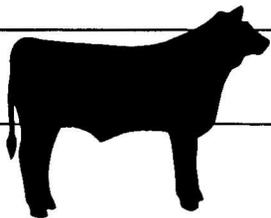
Feed additives and other medications, when used correctly, can improve the growth rate, feed efficiency and survival of your 4-H project. As a beef producer, you should know which feed additives and other medications you are using and why you are using them. Give your cattle feed additives

only at approved levels and in approved combinations. Use all other products according to label instructions and observe the directions and cautions.

Good day-to-day management is critical in preventing a residue problem in your herd. Identify treated animals, and mark your calendar to indicate withdrawal periods according to the date that you plan to sell your cattle. Plan in advance to withdraw medications from all animals that you will be exhibiting at your county fair so they will meet FDA guidelines by sale day. Inform your veterinarian of your plans to exhibit or sell

cattle before treatment. Ignoring regulations and withdrawal time is expensive and may cause a medication to be banned. Remember, producing wholesome beef for the consumer that is residue-safe can mean more profit for every producer.





Marketing

Beef producers, like other business operators, are working to produce and sell a top quality product. The goal of the beef industry is to raise cattle that will yield a maximum amount of edible meat. To properly market your steer and decide on a fair price for it, you must be able to determine its quality.

Determining Cattle Quality

When assessing the quality of cattle, two major areas must be considered: production traits and carcass traits. Production traits such as average daily gain, days required to reach market weight and feed efficiency are important to the beef producer. These traits are always used to measure how quickly and efficiently a calf grew. Production traits are measured on the live steer.

Carcass traits are measured after the steer is slaughtered and is in carcass form. Some commonly measured carcass traits are backfat depth, loin eye area, carcass length and percent muscle in the carcass. Many times producers and buyers try to predict carcass quality by estimating these carcass traits before the animal is processed. This is not always very accurate, but it can be a useful selection tool.

It is important that you know these measures of performance and carcass quality and understand what they mean. The normal ranges and average values for several of these traits are shown in table 6.

Production Traits

Growth rate—Average daily gain (ADG) and days required to

reach finished weight are both measures of growth rate. A greater value for ADG and fewer days to finished weight indicate a fast growing calf.

Feed efficiency value—This measures the amount of feed a calf requires to gain 1 pound. A feed efficiency value (sometimes called feed-to-gain ratio) of 70 means that a calf must eat 7 pounds of feed to increase its body weight by 1 pound. A low feed efficiency value is more desirable.

Carcass Traits

Many times, 4-H'ers don't receive carcass information on their project cattle. This is unfortunate, because seeing how your steer looks in carcass form can be very educational. Evaluating the carcass of the steer you raise this year might make choosing a calf easier next year. This section describes the physical measurements and characteristics of beef cattle that are known as carcass traits.

Dressing percentage—Dressing percentage represents the amount (percentage) of the steer's live weight that is present in carcass form. To calculate dressing percentage, divide the chilled carcass weight by the live weight and multiply by 100.

The amount of fat and the amount of fill (stomach and intestine contents) are the two factors that

Table 6. Normal Ranges and Average Values for Various Production and Carcass Traits

Traits	Normal Range	Average Value
Production		
Average daily gain (pounds per day)	2.00-3.50	2.75
Age (months)	12-18	15
Feed efficiency (pounds feed/pounds gain)	6-9	7.5
Carcass		
Live market weight (pounds)	1100-1300	1200
Dressing percent	60-65	62.5
Ribfat depth (inches)	0.2-0.7	0.4
Ribeye (square inches)	11.0-15.0	13.0
Yield grade	1.0-4.0	2.5
Quality grade	Low Select-High Choice	Low Choice

influence dressing percentage. Fat steers will dress higher than lean steers, while steers that are full of feed and water will dress lower than shrunk steers (those off feed for 12 to 24 hours).

Ribfat depth—Ribfat depth is measured at the 13th rib on the steer's topline. (see figure 15).

Ribeye area—This is a measurement of the size of the major muscle that is found in the loin. Ribeye area is determined by cutting the loin crosswise at the 13th rib and measuring the area of the muscle face. Ribeye area is a good indicator of the total amount or degree of muscling in an animal.

Yield grade—This identifies cattle for differences in the yield of boneless, closely trimmed retail cuts from the round, loin, rib and chuck (cutability). The yield is generally expressed as a percentage and indicates the amount of edible product in a given carcass. Throughout the beef industry, the percentage figure is converted to a yield grade designation between 1.0 and 5.9. A designation of 1.0 indicates the most desirable animal and a designation of 5.9 the least desirable. Table 7 lists the relationship between yield grade and percentage.

Quality grade—This is an estimation of the potential eating quality of the product, which would include flavor, tenderness and juiciness. Carcass quality grade is based upon an evaluation of marbling and age of the cattle. Marbling is the distribution of fat within the muscle. The beef quality grades are Prime, Choice, Select, Standard, Utility, Cutter and Canner. A designation of Prime is the most desirable and Canner is the least desirable.

Figure 15. Ribfat depth measurement.

Approximate location of the 13th rib where fat thickness is estimated.

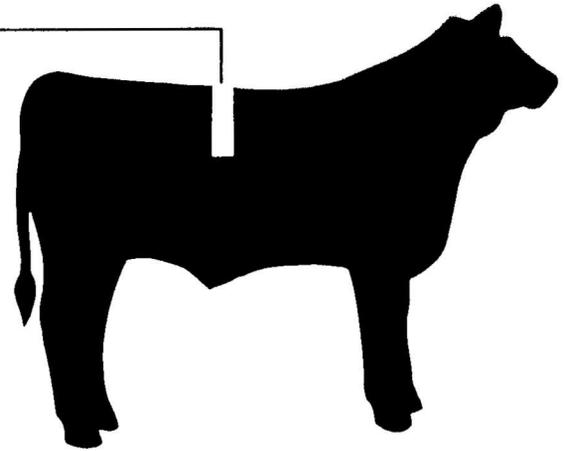


Table 7. Relationship Between Yield Grade and Cutability Percentage

Yield Grade	Percentage of Cutability
1.0	54.6
2.0	52.3
3.0	50.0
4.0	47.7
5.0	45.4

Selling Your Steer

Most 4-H members market their steers at their county fair or show sale. If you sell your steer by this method, you should check with your 4-H leader about the market price farmers are receiving for steers of similar weight and quality. If you receive more than this amount, it's due to the generosity of the person who bought your steer. You should consider it a reward for your efforts and not as the true value of the animal.

Many 4-H clubs find it advantageous to promote their county fair sale. You can promote your sale by visiting or sending letters to local businesses asking them to bid on your market steers. You can promote your auction by holding a buyer appreciation banquet after the sale as a special way of

thanking your buyers. You, your fellow club members and the club leader probably can think of additional ways to increase community support for your livestock auction.

If you don't market your steer at your county fair sale, there are livestock auctions and buying stations statewide that will buy your steer. Desirable market steers are always in demand. Your 4-H leader can help you choose one of these markets.

No matter where you sell your steer, have it look as attractive as possible and avoid filling it with extra feed and water. Buyers don't want to pay for this extra fill. They base their price on the pounds of meat your calf will produce. Market your steer when it's finished to the proper grade

and as near the desired weight as possible.

Send a thank you letter to the buyer of your 4-H steer as soon as you get home from the show. This lets the buyer know you appreciate their efforts and encourages support for future sales. It's also a good idea to thank your show and sale officials for their efforts in organizing a good show and sale. Also remember to thank your 4-H leader, parents and 4-H staff for all their help during the year.

Beef Products

The main reason for breeding, selecting, raising and selling beef cattle is to produce beef. The final step in beef production is the processing of beef cattle carcasses to yield a lean, meaty product for human consumption. After the steer has been slaughtered, carcasses are cut into wholesale cuts.

The wholesale cuts are depicted in figure 16 and the percentage of carcass weight and percentage of total carcass value are listed in table 8.

Each wholesale cut is trimmed of excess fat and separated into retail cuts. Retail cuts of beef are the meat that is sold in grocery stores and restaurants (see figure 17). It's important that you know all the wholesale and some of the more popular retail cuts of beef. This will give you a greater appreciation for the need to produce lean, meaty steers. Lean, meaty steers result in wholesale and retail cuts of beef with a larger proportion of lean than of fat.

Figure 16. Wholesale cuts of beef.

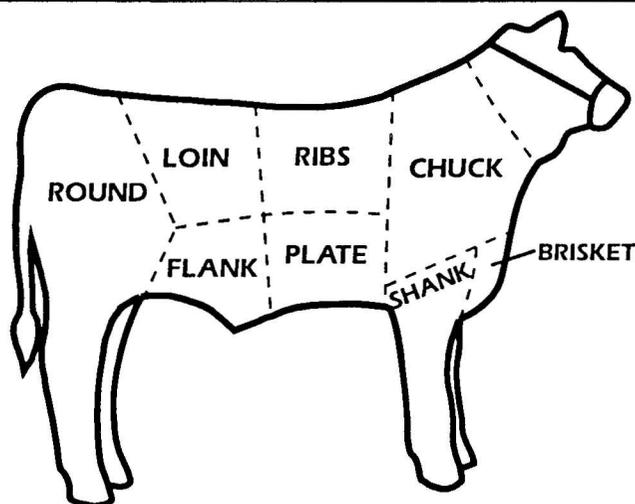
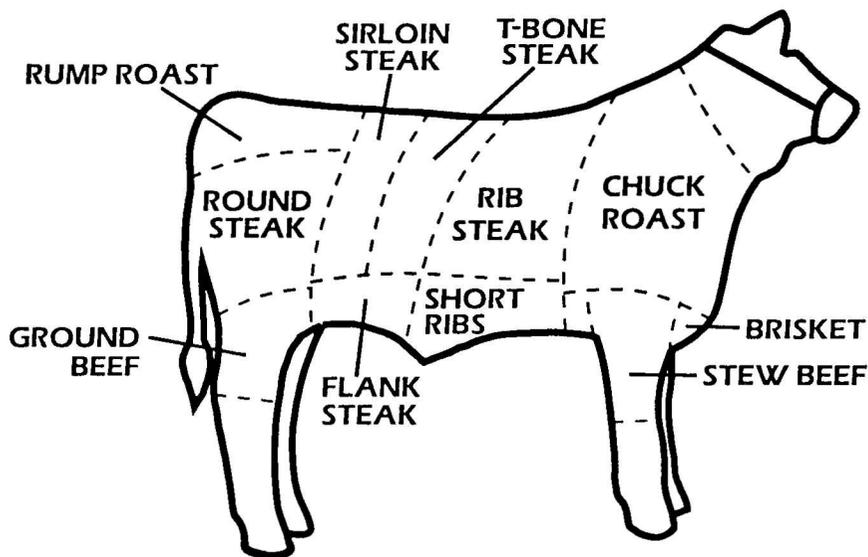


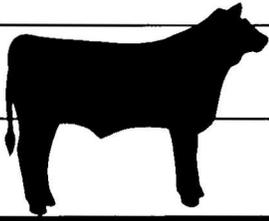
Table 8. Carcass Weight and Percentage of Total Carcass Value

	Percentage of Carcass Weight	Percentage of Total Carcass Value
Round*	22	29
Loin*	17	29
Rib*	9	11
Chuck	25	21
Brisket	6	4
Shank	5	1.5
Plate	8	2.5
Flank	4	1.5
Kidney knob	3	0.5

*Round, loin and rib account for approximately 50% of carcass weight and about 70% of carcass value.

Figure 17. Retail cuts of beef.





Other Activities

Information Development

You can use the information you have recorded in the **4-H Livestock Record for Intermediate and Advanced Members** (4-H 1177) to figure the following information:

- Weight of each calf at the start of the project.
- Weight of each calf when marketed.
- Total cost or value of the calf at the start of the project.
- Money you received from the sale of your steer.
- Market value of your calf when sold.
- Total amount of feed used.
- Total cost or value of the feed used.
- Total cost of any medicine or veterinary fees.
- Other expenses.
- Interesting or unusual things that happened to you and your calf during the project year.

From this information you can:

- Make a chart or graph showing the growth of your calf.
- Figure the rate of gain a day.
- Determine the feed cost for each unit of gain.
- Determine the number of units of feed required for each unit of gain.

Other 4-H Projects

A 4-H beef project is more than just owning and caring for cattle. Other projects will broaden your experiences and help you with

your market beef project. These include:

- **Veterinary science**—Study how to keep your calf healthy.
- **Crop science**—Produce forages and grain for your steer.
- **Photography**—Tell the story of your steer project with pictures.
- **Entomology**—Learn about parasites of cattle.

Demonstrations and Illustrated Talks

A demonstration or illustrated talk means getting up in front of a group and demonstrating or illustrating something from your project. You learn from the preparation and practice and your audience learns from your presentation. It teaches you how to speak and express yourself to a group. Demonstrations can be given in your club, at the county fair or in a national contest. You might give one at a community meeting or on television.

Some topics for your demonstration or talk might be:

- How to select a feeder calf.
- How to trim a calf's feet.
- The parts of a feeder calf.
- How to prepare a ration for a calf.
- How to make a rope halter.
- How to control parasites in beef cattle.
- How to prevent injuries when loading cattle.
- How to vaccinate a calf.
- Feeder calf grades.
- Cuts of beef.

You and your 4-H leader can think of other topics.

Public Speaking

Giving a speech on some phase of beef production will help you learn to express yourself and will give you a chance to learn more about beef cattle. You may want to pick a topic you don't know much about to increase your knowledge. Some topics for your speech might be:

- The beef industry in Michigan.
- The importance of beef cattle to the American people.
- The nutritive value of beef.
- By-products of beef.
- Why I chose a beef cattle project.

Judging

Livestock judging will help you learn to observe, evaluate and make decisions. It will give you a chance to see good livestock and to meet other 4-H members. Giving oral reasons will help you to feel comfortable expressing yourself.

Fitting and Showing

Fitting and showing teaches you to prepare and show an animal, as well as yourself. It teaches you to be a good showperson in and out of the ring, and it encourages good sportsmanship.

4-H Camp

Participating in activities such as 4-H camp will make you a well-

rounded 4-H member. 4-H camp is fun and provides an opportunity for you to meet other 4-H members in your county.

4-H Trips and Tours

Following are some trips and tours your club might take:

- A tour to 4-H members' homes to observe their project steers.
- A visit to the animal science farms and laboratories at Michigan State University.
- A trip through a feed manufacturing plant or a local elevator. If possible, have one of the nutritionists discuss how the livestock diets are formulated.
- A visit to the farm or ranch of a purebred beef breeder participat-

ing in a performance testing program. Have the breeder explain what he or she is doing and why.

- A visit to one or more of the various breed association field days that are scheduled each summer.
- A visit to a packing plant or food store. Emphasis should be on carcass desirability of slaughtered animals. Ask an official to explain the importance of a good carcass.
- A visit to a large livestock show or sale.

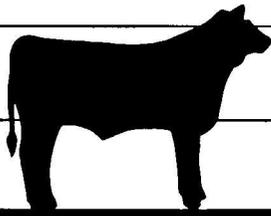
Careers in Animal Science

Use your 4-H beef project as a way of exploring careers in animal

science. Many professionals, such as farm managers, cattle buyers and veterinarians, work directly with animals. Other professionals, such as food scientists, meat cutters or meat inspectors, work with animal products.

With the help of your 4-H leader, make a list of all the careers related to animal science. Choose three or four careers from your list and investigate them. You may want to present your findings at your 4-H club meeting so others can benefit from your research.





References

Practices used in the beef cattle industry change as new technology becomes available. As you make decisions concerning your 4-H beef project, you will want to obtain the most current information. Current information is available from a number of sources.

- Michigan State University produces numerous publications and audiovisual materials dealing with various phases of beef production. Contact your county Extension office for this information.
- 4-H offers special learning opportunities for 4-H'ers in the

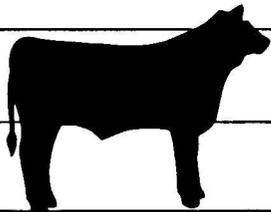
beef project. Visit with your county 4-H and youth leader for more information concerning educational activities at the county, area and state levels.

- Materials on beef and other meats can be obtained from the National Live Stock and Meat Board, 444 North Michigan Ave., Chicago, IL 60611.
- The U.S. Department of Agriculture (USDA) publishes a number of bulletins about beef that can be obtained from your county Extension office.

■ The Michigan Cattleman's Association, P.O. Box 387, DeWitt, MI 48820, provides information and educational materials about the beef industry.

■ Information on beef quality assurance and other beef-related topics can be obtained from the National Cattleman's Association, 5420 S. Quebec St., Englewood, CO 80111.

■ Other books dealing with beef and livestock in general may be found in your library.



American Beef Cattle Breed Associations

Listed below are some of the major beef breed associations.

- American Angus Association
3201 Frederick Blvd.
St. Joseph, MO 64501
(816) 233-3101
- American Chianina Association
P.O. Box 890
Platte City, MO 64079
(816) 431-2808
- American Gelbvieh Association
5001 National Western Dr.
Denver, CO 80216
(303) 296-9257
- American Hereford Association
1501 Wyandotte
Kansas City, MO 64101
(816) 842-3757
- American International Charolais Association
P.O. Box 20247
Kansas City, MO 64195
(816) 464-5977

■ American Maine-Anjou Association
528 Livestock Exchange Bldg.
Kansas City, MO 64195
(816) 474-9555

■ American Polled Hereford Association
4700 E. 63rd St.
Kansas City, MO 64130
(816) 333-7731

■ American Salers Association
5600 S. Quebec
Suite 220A
Englewood, CO 80111
(303) 770-9292

■ American Shorthorn Association
8288 Hascall St.
Omaha, NE 68124
(402) 393-7200

■ American Simmental Association
1 Simmental Way
Bozeman, MT 59715
(800) 548-0205

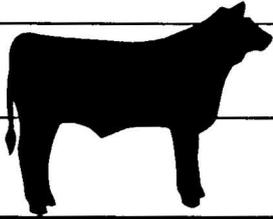
■ American Tarentaise Association
P.O. Box 446
Reed Point, MT 56069
(406) 532-7911

■ International Brangus Breeders Association, Inc.
P.O. Box 696020
San Antonio, TX 78269-6020
(512) 696-8231

■ North American Limousin Foundation
7383 S. Alton Way
Englewood, CO 80111
(303) 296-8835

■ North American South Devon Association
Box 68
Lynnville, IA 50153
(515) 527-2437

■ Red Angus Association of America
4201 I-35 North
Denton, TX 76201
(817) 387-3502



Glossary

Amino acids—small compounds that are the building blocks of proteins

Average daily gain (ADG)—a measure of a calf's daily growth rate; calculated by dividing the calf's total weight gain by the number of days required to achieve that gain

Beef cattle—refers to the bovine or beef cattle family in general

Blackleg—a disease of cattle caused by an organism

Bloat—abnormal condition in ruminants due to accumulation of gasses; usually seen on the animal's upper left side

Body proteins—amino acids linked together to form protein molecules that make up muscles, skin, internal organs, bones, blood, hair and hooves

Bovine virus diarrhea—an infectious disease of cattle caused by a virus

Bull—an intact (noncastrated) male

Calcium—a macromineral cattle need to build bones and teeth and to support other life processes

Calf—young, lightweight cattle of either sex

Carbohydrates—food including starch, sugar and cellulose

Carcass traits—characteristics of cattle such as muscling and leanness, which can be estimated on live animals but accurately measured only on beef carcasses

Castration—surgical removal of the testicles in male animals

Cattle grubs—an external parasite in cattle

Conformation—animal's physical form, shape and arrangement of parts

Coccidiosis—an internal parasite in cattle

Days to finish—amount of time from birth to when an animal reaches acceptable finished weight

Diet—nutritionally balanced mixture of feed ingredients

Dressing percentage—the portion of live weight that is represented as carcass weight; calculated by dividing live weight into carcass weight and multiplying the result by 100

Dry matter (basis)—feed after water content has been removed

Enterotoxemia—a disease caused by the secretion of toxins into the digestive system

Feed efficiency value—a measure of how many pounds of feed are required for the cattle to gain 1 pound; calculated by dividing the weight gain of an animal into the pounds of feed it eats

Feeder calf—an animal that needs further feeding before marketing as a finished animal

Finish—amount of fat cover on an animal

Foot rot—disease caused by an organism that affects the hoof and surrounding area

Frame size—an animal's size and stature relative to its age

Free-choice—a feeding system that offers feed ingredients cafeteria-style to the cattle

Going off feed—an animal's reluctance to eat

Growth rate—rate of weight gain

Heifer—female cattle less than two years old that have not had calves

Infectious bovine rhinotracheitis—a disease of cattle caused by a virus; rednose

Malignant edema—a disease of cattle caused by an organism

Market price—the normal selling price (value) of cattle on any given day

Market steer—finished cattle that are ready for marketing

Minerals—elements required by the cattle to build bones and teeth and to support other life processes

Phosphorus—a macromineral required by cattle to build bones and teeth and to support other life processes

Pinkeye—a disease caused by a bacteria

Pneumonia—inflammation of the lungs that results in breathing difficulties

Production traits—characteristics of beef measured by beef producers dealing with growth rate, feed efficiency and soundness

Protein—a dietary nutrient that supplies amino acids to the calf

Protein supplement—an ingredient of cattle diets that supplies protein, vitamins and minerals to the calf

Quality assurance—the conscious effort of beef producers to provide quality beef products that are residue-safe for consumers

Quality Grade—an estimation of the eating quality of beef products

Ration—the amount of feed consumed by a calf in one day

Red nose—see infectious bovine rhinotracheitis

Residue avoidance—following withdrawal times for medications, properly managing facilities and monitoring beef environments to prevent residue

Ribeye area—area of the major muscle in the loin; determined by cutting the loin of a beef carcass cross-wise and measuring the area of the exposed muscle.

Ribfat depth—a measure of the thickness of the fat layer covering a calf's back.

Ringworm—a contagious fungus that causes hair loss

Ruminant—an animal that has four stomach compartments (rumen, reticulum, omasum and abomasum)

Shipping fever—a respiratory disease of cattle

Steer—a castrated male

Thriftiness—general healthy appearance

Toxin—a poison produced by organisms

Urinary calculi—a disease caused by improper balance or insufficient levels of minerals; water belly

Vitamins—dietary nutrients needed in very small amounts for the health of eyes, nasal passages and lungs; for strong bones; for blood clotting; and for other body functions

Warts—a viral infection of the skin

Water belly—see urinary calculi

Withdrawal time—the length of time that medications must be removed from a cattle before slaughter

Yield grade—an estimation of the edible product in a beef carcass

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