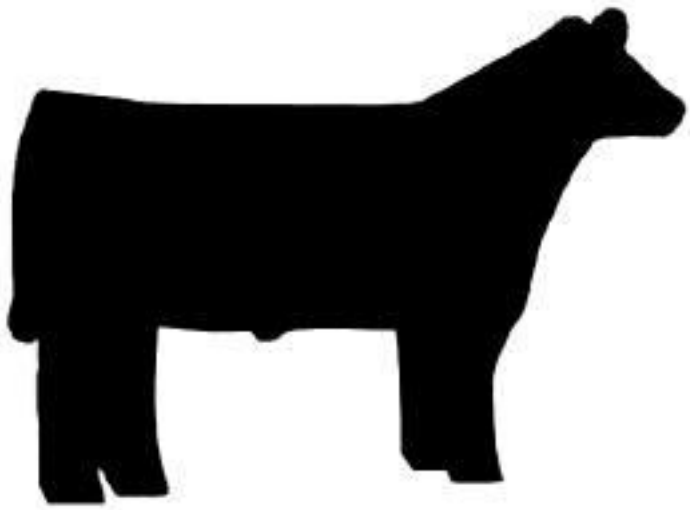
FRESNO COUNTY 4-H
LIVESTOCK ACHIEVEMENT PROGRAM

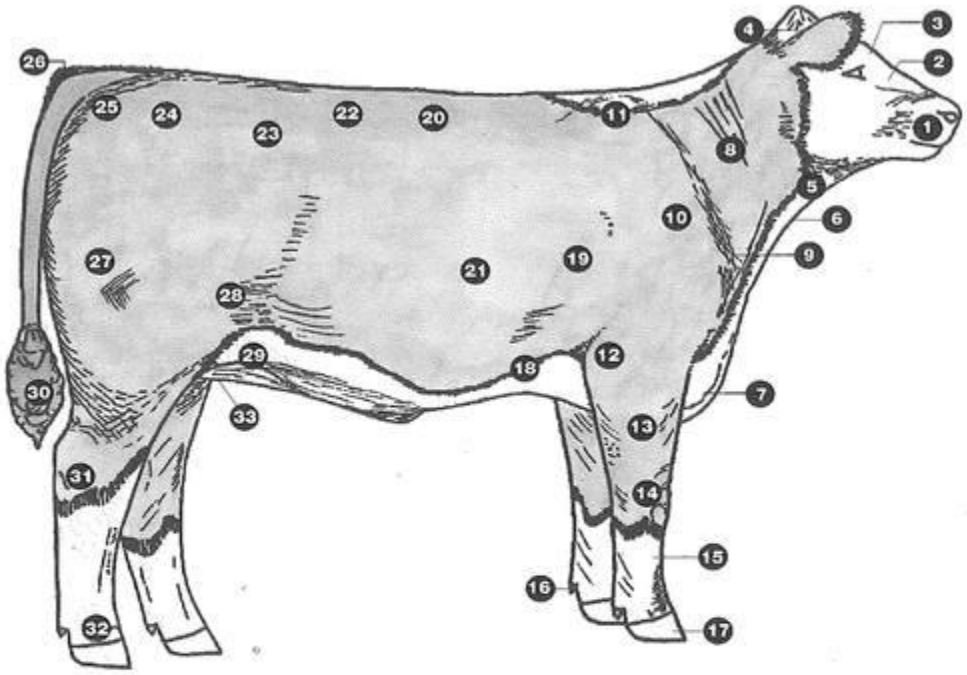
BEEF CATTLE STUDY GUIDE
LEVEL 1, 2, 3, 4, & 5



Revised – January 2020

PARTS OF THE BEEF ANIMAL

Level 1, 2, 3, 4, & 5



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

BREEDS OF BEEF CATTLE
Level 1, 2, 3, 4, & 5

A breed of cattle is a group of animals that has similar characteristics. They can pass these characteristics on to their offspring. [1] Worldwide, there are more than 250 breeds of beef cattle and more than 60 different breeds are present in the United States. [2] Beef breeds are used to produce meat, while dairy breeds are used primarily to produce milk.

The following breeds and their crosses are popular in Fresno County as well as throughout California:

English Breeds
- **Angus**
- **Hereford**
- **Shorthorn**

Continental Breeds
- **Charolais**
- **Maine Anjou**
- **Simmental**

[1] http://4h.ansci.cornell.edu/files/2013/12/beefu2-1eibqeo.pdf

[2] http://pubs.ext.vt.edu/400/400-803/400-803.html

The Angus breed originated in the northeastern part of Scotland. When George Grant transported four Angus bulls from Scotland to the middle of the Kansas prairie in 1873, they made a lasting impression on the U.S. cattle industry. The first great herds of Angus beef cattle in America were built up by purchasing stock directly from Scotland. Twelve hundred cattle alone were imported, mostly to the Midwest, in a period of explosive growth between 1878 and 1883. Over the next quarter of a century these early owners, in turn, helped start other herds by breeding, showing, and selling their registered stock. Angus are known for fertility, calving ease, mothering ability, resistance to pink eye because of dark skin pigmentation, and propensity to marble (distribute fat within the meat) more than any other breed thus producing a high-quality carcass. The Angus breed has the largest branded-beef program, Certified Angus Beef, in the world. Angus cattle are black but there is also a Red Angus breed. Angus are polled.

The Hereford breed was founded near Hereford in the County of Herefordshire, England. Thrifty and enterprising farmers were determined to produce beef for the expanding food market created by Britain's industrial revolution. To succeed in Herefordshire, these early-day cattlemen realized they must have cattle which could efficiently convert their native grass to beef and do it at a profit. There was no breed in existence at the time to fill that need, so the farmers of Herefordshire founded the beef breed that logically became known as Herefords. These early Hereford breeders molded their cattle with the idea in mind of a high yield of beef and efficiency of production, and so firmly fixed these characteristics that they remain today as outstanding. Hereford cattle are known for fertility, feed efficiency, good disposition, adaptability and hardiness. Hereford cattle are red with white faces. Hereford cattle have horns; Polled Hereford cattle do not.

The Shorthorn breed originated on the northeastern coast of England. Although Shorthorns came first, in the 1870's breeders discovered 'natural hornless' cattle occurring from time-to-time in horned herds. Thus, Polled Shorthorns were discovered and were the first major beef breed to be developed in the United States, having gained its origin in 1881 in Minnesota. Polled Shorthorns possess the same qualities for adaptability, mothering ability, reproductive performance, good disposition, feed conversion, longevity and popularity as their horned counterparts. Shorthorn cattle are red, white, or roan in color. Shorthorns are horned or polled.

The Charolais breed originated in France. The exact origins of the Charolais are not known but it must have been developed from cattle found in the area. Selection developed a white breed of cattle which, like other cattle of continental Europe, were used for draft, milk, and meat. It has been said that no other breed has impacted the North American beef industry so significantly as the introduction of Charolais. The Charolais came into widespread use in the United States cattle industry at a time when producers were seeking larger framed, heavier cattle than the traditional British breeds. Charolais are known for size, ruggedness, outstanding muscling, growth, and cutability. Charolais cattle are white or creamy white in color. They are horned or polled.

The Maine-Anjou breed originated in the northwestern part of France. Breeders of the cattle were mostly small farmers whose goal was to maximize income from their small area of land. For this reason, the Maine-Anjou evolved as a dual-purpose breed, with the cows used for milk production and the bull calves fed for market. The first Maine-Anjou imported into North America came to Canada in 1969. These cattle were then introduced to the United States through artificial insemination which minimized any undesired traits. This systematic crossbreeding strategy has been put into effect by breeding more Black Angus into the Maine-Anjou. The Maine-Anjou have good dispositions, are feed efficient, large cattle that provide high cutability and marbling qualities. Maine-Anjou cattle are traditionally very dark red with white markings on the head, belly, rear legs and tail. White on other parts of the body is also common. Today, however, they are more solid in color pattern with black, red, and black and white being the popular choice. They can be horned or polled.

The Simmental breed of cattle originated in Switzerland. The ability to adapt to its environment has allowed them to become influential in cattle markets across the world. Simmentals were developed at a time that cattle were multipurpose, raised for their meat as well as their heavy milking ability and even draft uses. They are rugged animals with substantial bone, and they have fast growth rates. Cows are excellent mothers and have very long production cycles. Though their milking abilities have not been selected for, the Simmental continues to be an above average milker. They are docile and have excellent weight gaining abilities. The carcass yield is very good, with meat grading high. The original color for Simmentals was red and white or gold and white. All colors and all color patterns are accepted within the American Simmental Association. Simmental cattle are naturally horned but through crossbreeding and upbreeding, they may also be polled.

BEEF CATTLE EVALUATION AND SELECTION
Level 1, 2, 3, 4, & 5

In order to evaluate and select beef cattle, you must have an understanding of the parts of the beef animal as well as the desirable characteristics. Visual appraisal can be a good indicator of the frame size, muscle and body structure, predisposition to put on fat, feet and leg structure and breed character. When evaluating cattle, consider the structure, muscling, body capacity, style, balance, and movement of the animal. In addition to those areas, special consideration should be given to the soundness of feet and legs, breed and sex characteristics, and reproductive organs when evaluating breeding animals.

Structure

Strong bone and correct skeletal structure are important and essential for any animal getting to feed and water. You can observe structure in the angle of the shoulder, levelness of top line and hip, pastern angle, and movement. An animal must be structurally correct and sound on their feet and legs, which enables them to move about comfortably and easily.

Terms Used to Describe Structure

A number of terms are used to describe the feet and leg structure of an animal.

Pigeon Toed or Bowlegged - When viewed from the front or rear, the knees are set too far out, causing the toes to turn inward.

Splayfooted or Knock Kneed - When viewed from the front, the knees are set too close together and the feet toe out away from each other. This problem is often seen in extremely light-muscled, narrow-chested cattle when the legs are naturally set too close together.

Cow Hocked - When viewing the hind legs from the rear, the hocks are turned inward or are placed too close together, causing the toes to turn outward.

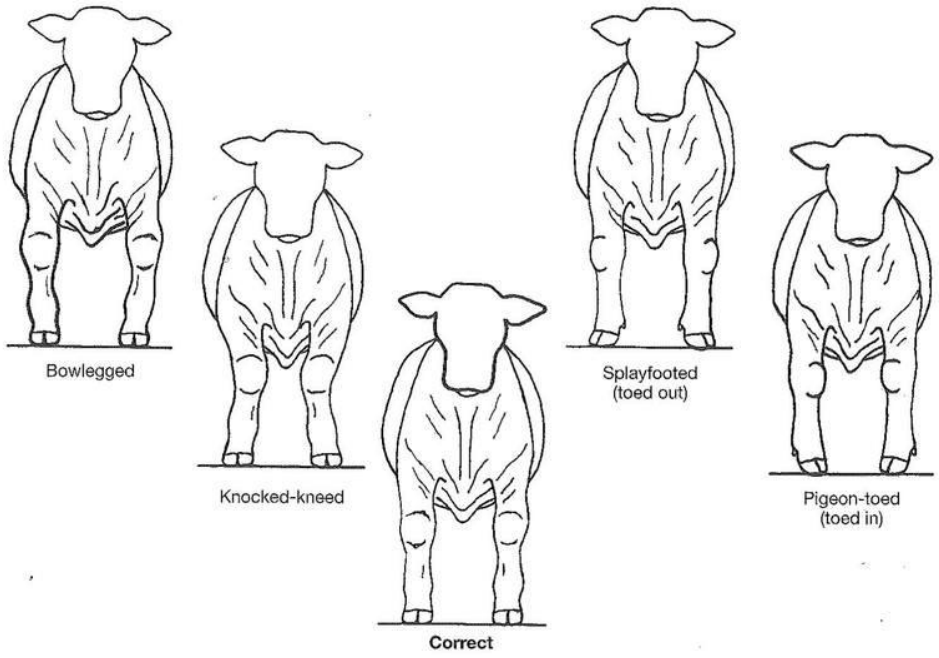
Sickle Hocked - When viewing the rear legs from the side, the hock has too much angle or set, causing the steer to stand too far underneath himself. Often these calves will droop excessively from hooks to pins.

Post Legged - The hock has too little angle or set. The calf is too straight through the joint, resulting in very stiff, restricted movement because of the lack of flexibility. More cattle become unsound because of being post legged than sickle hocked.

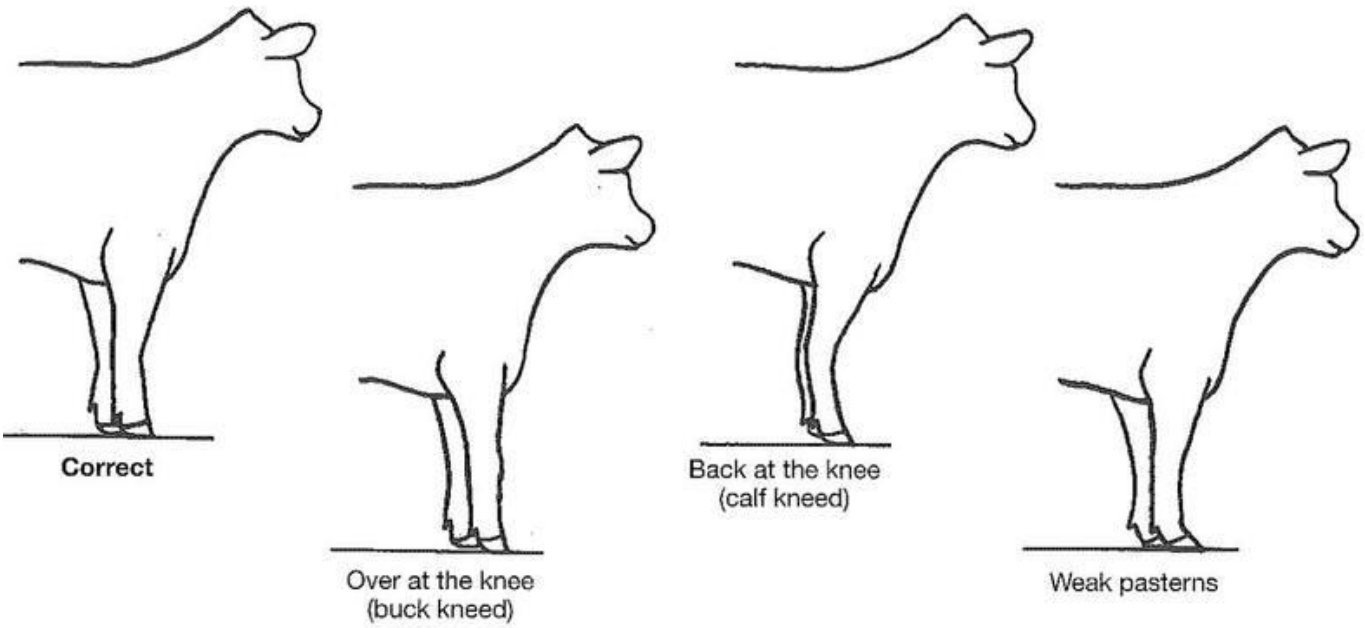
Buck Kneed - When the calf is "over at the knees" or buck kneed, full extension of the knee cannot occur. When observed from the side the legs appear slightly bent. This is usually seen in cattle that are too straight in the shoulder.

Calf Kneed - This is the other extreme, the opposite of buck kneed, where the calf stands "back at the knees" when viewed from the side.

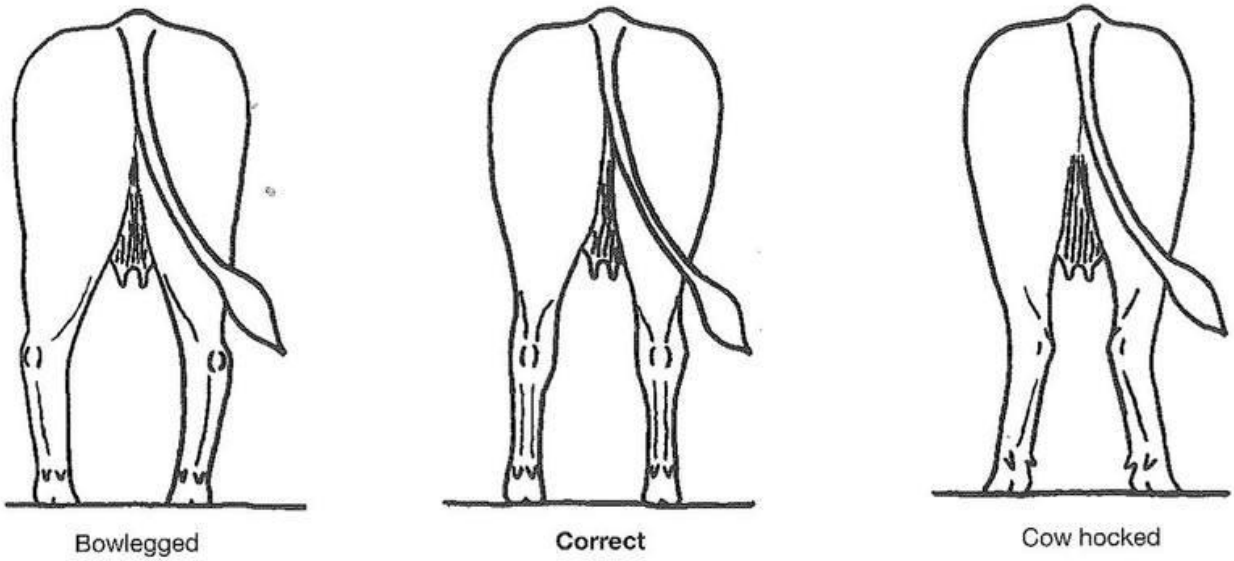
Front Leg Alignment



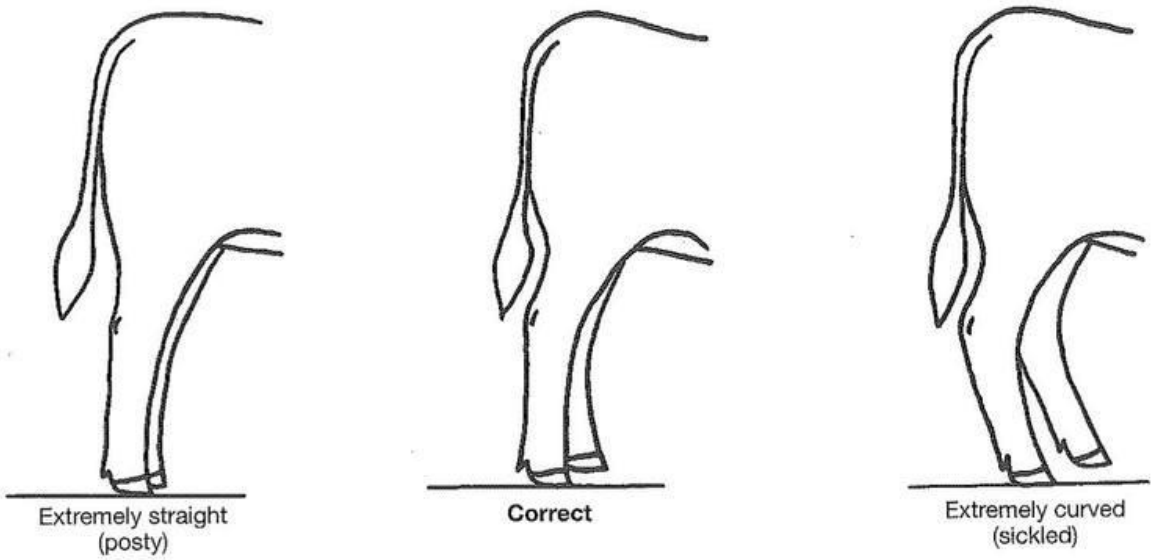
Front Leg Set



Rear Leg Alignment



Rear Leg Set



Acknowledgements:
Illustrations were taken from "Pennsylvania 4-H Livestock Judging Manual"

Muscling

Muscling is important in beef cattle. Heavily muscled animals produce more meat and less fat. You can see indications of muscling over an animal's top, in the loin area, length of hip, width of stifle, and in the hind quarters

Body Capacity and Performance

The capacity or volume of a beef animal indicates how well the animal may perform. You want a deep bodied animal, which can consume large amounts of feed. Indicators of capacity and performance are width of chest floor, width across shoulder blades, ribcage (length, depth and shape or spring), and depth of flank. Higher volume cattle are generally easier fleshing and lower maintenance.

Style and Balance

When evaluating the style and balance of a beef animal, consider its eye-appeal. Note how the body parts blend together, how well-proportioned the animal is front to rear, and how uniform it is in its muscling, trimness, and skeletal structure.

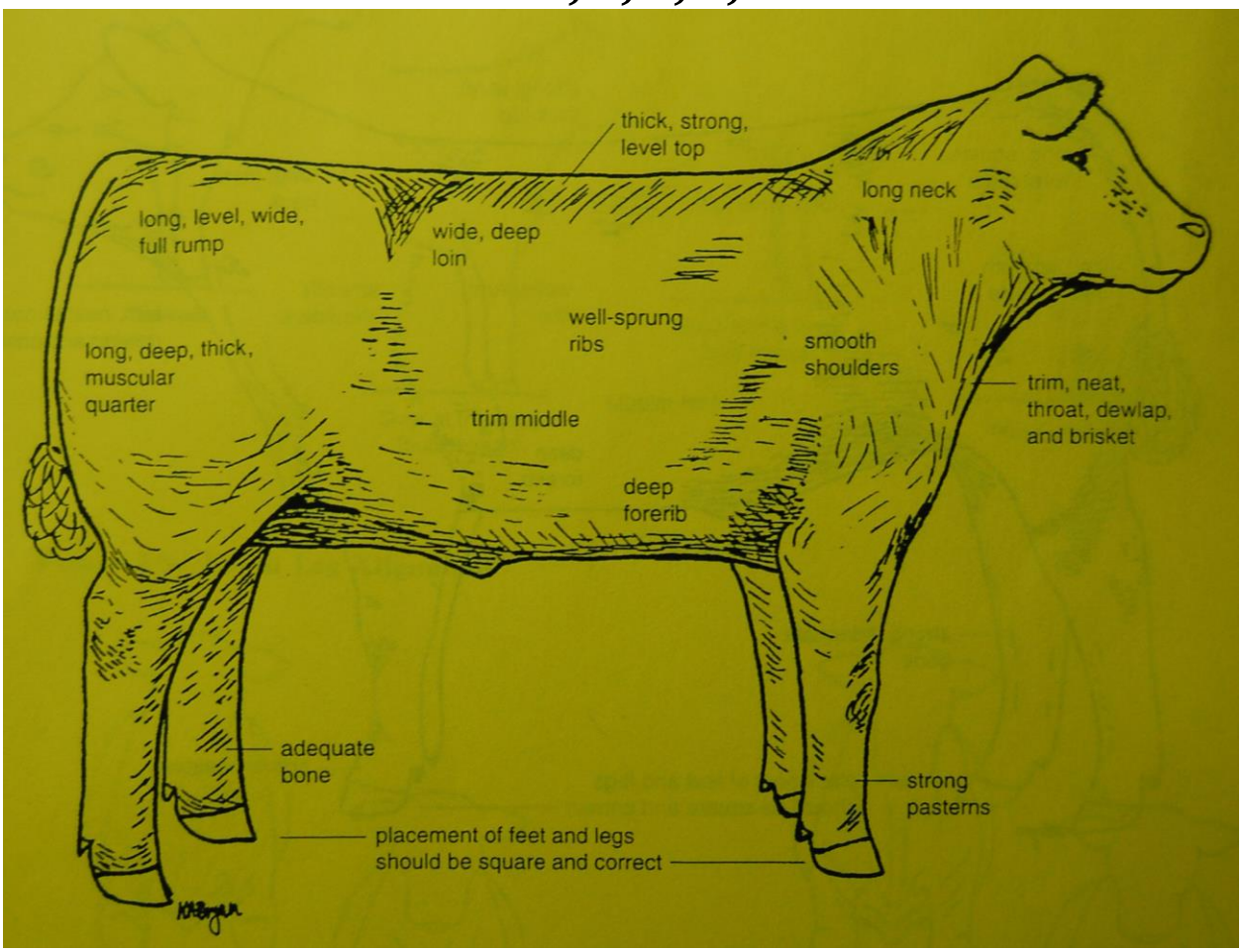
Movement

When a beef animal moves, it should walk freely and easily. The legs should track correctly, meaning that the back feet step into the tracks left by the front feet. The animal should walk wide, indicating adequate muscling.

Age and Weight

Most calves are weaned at about 7 to 8 months of age and placed on feed between 6 and 10 months of age. When selecting a feeder calf, consider that calves weighing 500 - 650 pounds at the time of selection and placed on feed for 270 days, will usually reach the correct finish and weight of 1150-1330 pounds between 18 and 20 months of age.
When selecting a breeding heifer,

IDEAL MARKET STEER
Level 1, 2, 3, 4, & 5



Age 18-24 months
Live weight 1150-1330 lbs
Fat thickness 0.35-0.50 inch measured between 12th and 13th rib
Ribeye area 12 – 15 square inches
Quality grade USDA Choice

IDEAL BREEDING HEIFER
Level 3, 4, & 5

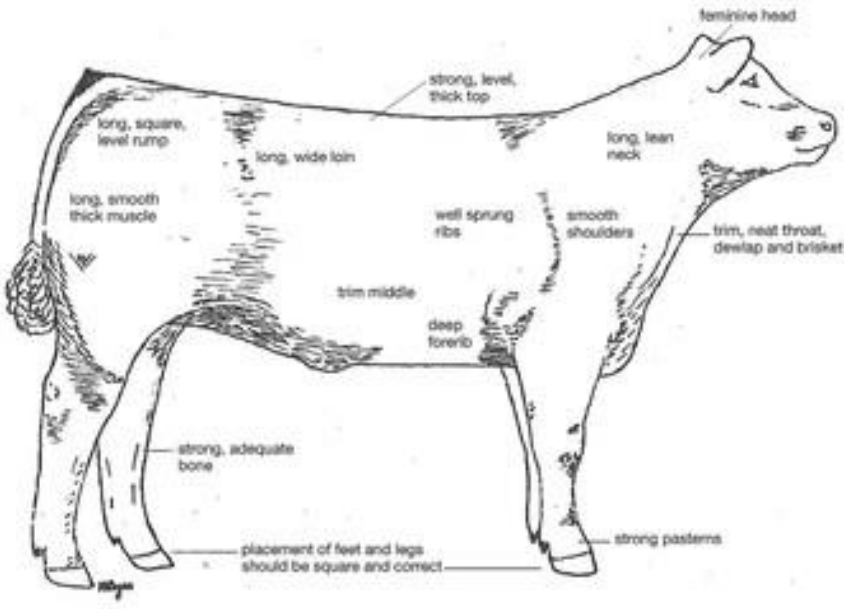


Image from http://extension.psu.edu/courses/beef/selection-principles/understanding-beef-cattle-structure/characteristics-of-an-ideal-breeding-heifer

Age at breeding: Typically 16 – 18 months
Size at breeding: Heifer should be at least 2/3 of her expected mature body size and weight when bred
Structurally correct: Sound on legs and feet; deep bodied
Feminine characteristics: Refined head, long trim neck, smooth through the shoulders

See pages 2-16 – 2-17 Beef Resource Handbook, Ohio State University Extension, 2011, 2001

Livestock Judging – Beef Cattle
Level 1, 2, 3, 4, & 5

Livestock judging provides 4-H members with an opportunity to use their knowledge of correct beef cattle conformation to evaluate and place a class of animals. Level 3 & 4 members will also present oral reasons in order to explain and defend their placement of the class.
By judging livestock, members learn:

- How to evaluate the conformation of different breeds and classes of beef cattle
- How to defend their placings through the delivery of oral reasons

Included below is a suggested oral reasons format. Members can insert the information from the class they're judging and use the format to help them prepare and present their "reasons".

Introductory Guide to Reasons Format

(from http://www.thejudgingconnection.com/pdfs/Livestock_Judging_Manual.pdf)
View the entire manual at the above listed website

I placed the _____ _____
(class name) (the placing order, ie. 3-1-4-2)

I chose to start the class with the pair of _____,
(positives about the top pair)

however, the _____ of _____
(positive about top individual) (# of class winner, ie. #3)

lead me to place him/her over _____ in my top pair.
(second place animal, ie. #1)

_____ is a _____. In
(class winner) (positive terms about class winner)

addition, he/she is _____ than
(positives comparing class winner to second place animal)

_____. I admit that _____
(second place animal) (second place animal)

is _____, but he/she is _____
(grants or positives for second place animals over class winner) (negatives about second place animal)

and I left him/her second.

However, in my middle pair, the _____ of
(advantages of second place animal)

_____ left him/her over _____. He/She is
(second place animal) (third place animal)

_____ than _____.
(positives of second place over third place animal) (third place animal)

Furthermore, he/she is _____. Although
(positives of second place animal)

_____ is _____, he/she is
(third place animal) (grants or positives of third place animal)

_____, therefore, I placed him/her third.
(negatives of third place animal)

Even so, in bottom pair I chose to place _____ over
(third place animal)
_____. He/She is _____.
(fourth place animal) (positives of third place animal over fourth place animal)

At the same time, he/she is _____. I
(more positives about third place animal over fourth place animal)

grant that _____ is _____, but this does not
(fourth place animal) (grants or positives about fourth place animal)

make up for the fact that he/she is _____ and therefore is
(negatives about fourth place animal)

placed at the bottom of this class.

BEEF CATTLE FACILITY REQUIREMENTS
Level 3, 4, & 5

For cattle to do well, they need facilities that offer room to move freely, are clean, offer protection from the weather, have access to clean fresh water and feed, and are made strongly enough to keep mature cattle safely contained. The suggested minimum pen size is 100-120 square feet for a pen for one animal, with extra space available for exercise. For cattle on pasture, the number of animals per acre varies depending on the condition of the pasture.

For show steers and heifers, some 4-H members house them in pens that are shaded and have fans or other cooling systems to keep cattle cool. The cattle can be turned out into a larger pen at night to get exercise. This method helps to keep cattle cool, clean, and comfortable. A blocking chute or a tie-post, and easy access to running water are helpful to have if you are raising show cattle so you can easily restrain and groom your cattle.

It's important that any facilities used for cattle are safe for the animals and the handlers.

See p. 3.1-3.2, 4.1-4.6 Beef Resource Handbook, Ohio State University Extension, 2011, 2001

ENVIRONMENTAL CONCERNS
Level 5

Whether you raise one animal or multiple animals, it's important to understand your responsibility to maintain a clean facility. Livestock waste must be handled properly in order to protect your animals, yourself, your neighbors, and the environment including surface water, ground water, and air quality. The more animals that you have in an area, the more important it becomes to have a plan for cleaning and maintaining your property. Things to consider include:

- Manure disposal – a 1000-pound beef animal will produce about 60 pounds of manure each day.
- Waste disposal – dirty bedding, wasted feed, and dirty water will need to be disposed of
- Disposal of dead animals – counties have various requirements regarding the disposal of dead animals;
- Minimizing contamination of surface water such as creeks and ponds
- Dust control
- Odor control

See p. 13.1-13.6, Beef Resource Handbook, Ohio State University Extension, 2011, 2001

BEEF CATTLE TERMS
Level 1 & 2

1. **Bloat** – excessive gas build-up in the rumen (stomach)
2. **Bull** – male cattle
3. **Calf** – young cattle, under one year of age
4. **Carcass** – body of animal after it has been slaughtered, skinned, and the insides removed
5. **Castrate** – removal of testicles of male cattle
6. **Concentrate** – feed stuffs, such as grain, that are low in fiber and high in digestible nutrients
7. **Condition** – degree of fatness in a meat animal
8. **Conformation** – shape and design of the body
9. **Cow** – mature female cattle
10. **Crossbreeding** – mating of purebred cattle of different breeds
11. **Cutability** – the amount of red meat in a carcass; a carcass with high cutability would have a high percentage of meat compared to fat
12. **Dehorn** – removal of horns
13. **Disposition** – temperament and attitude of an animal when handled
14. **Dressing percentage** – carcass weight divided by live weight multiplied by 100
15. **Feed efficiency** – comparison of the amount of feed that must be eaten in order to achieve a pound of gain in weight; cattle average 6 lbs. of feed to gain one pound of weight.
16. **Fill** – amount of feed and water in an animal
17. **Heifer** – female cattle under 3 years of age that has not produced a calf
18. **Marbling** – flecks of fat distributed throughout meat, used to determine quality grades
19. **Off feed** – to stop eating or eat very little
20. **Polled** – cattle born without horns
21. **Quality Grades of Beef** – Prime, Choice, Select, Standard, Commercial, Utility, Cutter, Canner (USDA grades)
22. **Ration** – total feed given during a 24-hour period
23. **Ribeye** – measured between the 12^{th} & 13^{th} rib on beef carcass; most reliable indicator of muscling in a carcass
24. **Roughage** – feeds high in fiber (hay, silage, grass)
25. **Scours** – diarrhea or loose running manure
26. **Steer** – male cattle that has been castrated

BEEF CATTLE TERMS

Level 3 & 4 (May also include Level 1 & 2 terms)

27. **Antibiotics** – Substances made from organisms that can kill bacteria; used to fight diseases caused by bacteria
28. **Artificial Insemination (AI)** – Placing the semen from a bull into a cow's reproductive tract using an artificial method
29. **Average Daily Gain (ADG)** – Calculated by: Final Weight – Beginning Weight divided by the number of days on feed; important indicator of an animal's feed efficiency
30. **Bio-security** – A series of management procedures designed to prevent or greatly reduce the risk of introducing new infectious agents to a farm
31. **Brand** – Permanent marking on skin caused by scar tissue
32. **Calf Crop** – The percentage of calves produced in a herd in a year relative to the number of females that were bred at the beginning of the breeding year.
33. **Calving Ease** – Refers to the lack of difficulty in giving birth.
34. **Cod** – Scrotum of steer that contains fat
35. **Colostrum** – Thick, yellow milk (first milk) produced by a cow the first few days after calving; high in antibodies that give the calf protection against diseases; higher in protein and vitamins than regular milk
36. **Condition** – Degree of fatness in a breeding animal
37. **Conformation** – Shape and structure of the body
38. **Cull** – Animal taken out of herd because below herd standard
39. **Dam** – Mother of calf
40. **Dressing Percentage** – The proportion of carcass weight relative to live weight of an animal (carcass weight divided by live weight); average dressing percentage of beef is 62%
41. **Estrous Cycle -** The reproductive cycle of the female that prepares an egg for fertilization; average length of a cycle in cattle is 21 days.
42. **Estrus (heat)** – The part of the estrous cycle when a female may be successfully bred.
43. **Expected Progeny Difference** (EPD) – The estimate of how future offspring of a sire (bull) are expected to perform in various traits.
44. **Finish** – Amount of fat cover on a market animal
45. **Gestation** – Period of time cow is pregnant with calf (average 283 days)
46. **Heredity (genetics)** – The passing on of genetic or physical traits of parents to offspring.
47. **Lactation** – Period of producing milk
48. **Open Cow or Heifer** – A cow or heifer that is not pregnant.

49. **Pedigree** – Written statement giving the record of an animal's ancestry
50. **Registered** – Purebred animals whose pedigree is recorded with a breed registry
51. **Replacement Heifer** – A female selected to keep for use in a breeding herd
52. **Rib Eye Area** – The surface area of the longissimus dorsi muscle between the 12^{th} and 13^{th} rib of a beef carcass.
53. **Sire** – Father of a calf
54. **Wean** - To take the calf from its mother; usually 6-8 months of age for beef cattle
55. **Withdrawal Time** – In the case of meat animals, it is the period of time that must pass between the last treatment with a medication and the slaughter of the animal. This time period allows the medication to be eliminated from the animals' body so that meat from the animal does not contain unsafe residues of medication.
56. **Yield Grades** – Used to evaluate the amount of red mean in a carcass (Yield grade 1,2,3,4,5, with Yield grade 1 having the most meat and least fat.)

BEEF CATTLE TERMS

Level 5 (May also include Level 1, 2, 3, & 4 terms)

57. **Animal Unit Months (AUM) -** the amount of forage necessary to sustain one cow for a period of 1 month. (Used for considering grazing capacity.)
58. **Backgrounding**- a practice of grazing cattle up to approximately 800 pounds before placing them on a high-concentrate finishing diet in a feedlot.
59. **Body Condition Scores** - Body condition scores (BCS) are numbers used to estimate energy reserves in the form of fat and muscle of beef cows. BCS ranges from 1 to 9, with a score of 1 being extremely thin and 9 being very obese. Areas such as the back, tail head, pins, hooks, ribs, and brisket of beef cattle can be used to determine BCS.[3]
60. **Branded Beef** - beef in the supermarket that carries a brand name on the package. Branded beef delivers a promise to the consumer such as consistency in taste, tenderness, juiciness and flavor. Every Branded Beef program is unique. Most programs are specifically labeled by breed (ie. – Certified Angus Beef), company (ie. – Harris Ranch), or store (ie. – Safeway/Vons "Rancher's Reserve") and they may offer some kind of satisfaction guarantee.[4]
61. **CDFA** – California Department of Food and Agriculture
62. **Certified -** "certified" implies that the USDA's Food Safety and Inspection Service and the Agriculture Marketing Service have officially evaluated a meat product for class, grade, or other quality characteristics (e.g., "Certified Angus Beef"). When used under other circumstances, the term must be closely associated with the name of the organization responsible for the "certification" process, e.g., "XYZ Company's Certified Beef."[5]

63. **Composite Breed** – the term "composite" as used in beef cattle breeding refers to the mating of crossbred cattle that have the same breeds and fractions or percentages of each breed in order to maintain the benefits of crossbreeding while keeping a consistent outcome of traits.

[3] https://pubs.ext.vt.edu/400/400-795/400-795.html

[4] https://www.beefboard.org/news/files/Beef%20enewsletter%20files/Branded%20Beef.pdf

[5] https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/food-labeling/meat-and-poultry-labeling-terms/meat-and-poultry-labeling-terms

64. **Dark Cutter** – condition in which the lean meat of a beef carcass has a darker than normal color; caused by cattle being subjected to stressed conditions just prior to processing (slaughter).
65. **Embryo Transfer –** surgically removing fertilized eggs from a donor cow and placing them in recipient cow
66. **Estrus Synchronization/Heat Synchronization –** a technique using hormones to bring a group of females in heat at the same time, to breed all of them within a short period of time
67. **Feeder Calf –** a young calf, 5-9 months of age, that is weaned and started on a feeding program.
68. **Feedlot –** a cattle facility which feeds young beef cattle to the point of harvest (processing/slaughter)
69. **Flight Zone –** A animal's flight zone is similar to your personal space—it is the distance from an animal that a handler must maintain for the animal to feel comfortable. When a person enters a beef animal's flight zone, the animal will move. A well-broke show animal that is accustomed to human interaction on a daily basis has a smaller flight zone than a beef animal out on the range (the flight zone of such an animal might be up to 300 ft.).[6]
70. **Forage -**plants, such as grass or hay, used as feed for livestock
71. **Free Choice –** allowing cattle to have access to a feed or supplement at all times.
72. **Grass Fed -** ruminant animals whose diet throughout their lifespan is derived solely from grass (forage), with the exception of milk consumed prior to weaning; (This marketing claim standard was withdrawn by the USDA's Agricultural Marketing Service in 2016 but is still used as a reference).
73. **Grazing Permit -** a document that authorizes grazing use of public lands. A grazing permit specifies animal unit months and the terms and conditions during the term of the permit.[7]
74. **Heritability –** the amount of differences among cattle that is transmitted to the offspring. The higher the heritability of a trait, the more likely that trait will appear in the offspring.
75. **Heterosis/Hybrid Vigor –** increased health, growth, yield, or other superior qualities arising from the crossbreeding of genetically different plants or animals.

[6]http://articles.extension.org/pages/63136/what-is-a-cows-flight-zone

[7] https://www.law.cornell.edu/cfr/text/43/4100.0-5

76. **Humane Handling -** treating livestock in such a manner as to minimize excitement, discomfort, and accidental injury.[8]
77. **Natural –** a product containing no artificial ingredient or added color and is only minimally processed. Minimal processing means that the product was processed in a manner that does not fundamentally alter the product. The label must include a statement explaining the meaning of the term natural (such as "no artificial ingredients; minimally processed").[9]
78. **Organic -** organic certification verifies that livestock are raised according to the USDA organic regulations throughout their lives.[10]
79. **Ovary -** the female organ that produces eggs. There are two ovaries in the female reproductive tract.
80. **Ovulation -**the time when the egg is released from the ovary. In cattle, it occurs 10-16 hours after the end of standing heat.
81. **Placenta** or **Afterbirth -** the membrane in which the calf develops and through which it receives nourishment. After calving, the placenta is expelled by the cow.
82. **Semen** – sperm mixed with the fluids from the accessory glands of the male.
83. **Slaughter** - the act of killing; *specifically*: the butchering of livestock for market
84. **Spay –** surgical removal of the ovaries to prevent estrous cycles and pregnancy.
85. **Sperm** – the male sex cells produced in the testicles.
86. **Standing heat –** the window of time during estrus (heat) when a female is receptive to mating.
87. **Structural Soundness –** the condition of the skeleton, especially the feet and legs, of cattle.
88. **Supplement –** a feed ingredient added to the feed ration or provided to cattle free choice.
89. **Total Digestible Nutrients (TDN) –** an estimate of the energy requirements of an animal; TDN is used to show the feed values of different types of feed.
90. **USDA –** United States Department of Agriculture

[8] https://www.fsis.usda.gov/wps/wcm/connect/da6cb63d-5818-4999-84f1-72e6dabb9501/Comp-Guide-Systematic-Approach-Humane-Handling-Livestock.pdf?MOD=AJPERES

[9]https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/food-labeling/meat-and-poultry-labeling-terms/meat-and-poultry

[10] https://www.ams.usda.gov/sites/default/files/media/Organic%20Livestock%20Requirements.pdf

BEEF CATTLE EQUIPMENT ID

Level 1 & 2

Members should be able to identify the following equipment & supplies:

Blocking Chute
Branding Iron
Clipper Blades
Disposable Needle
Disposable Syringe
Ear Tag
Ear Tag Applicator
Electric Blower
Electric Branding Iron
Electric Clippers
Feed Pan
Hair Dressing (Show Sheen, Final Bloom)
Neck Rope
Rice Root Brush
Rope Halter
Scotch Comb
Show Halter
Show Stick
Spray Adhesive
Spray Bottle

Level 3, 4, & 5

Members should be prepared to identify *and describe use* of Level 1 & 2 equipment as well as the equipment listed below:

A.I. Pipette
Balling Gun
Calf Drencher
Calf Snare
Cattle Magnet
Dehorner
Elastrator
Eye Patch
Obstetrical Chain
Squeeze Chute

BEEF CATTLE FEED ID
Level 1 & 2

Members should be able to identify the following types of feed:

Alfalfa hay

Barley

Beet pulp

Calf Manna

Corn

Cottonseed hulls

Fat supplement

Grass hay

Oats

Oat hay

Winter forage hay

BEEF CATTLE FEEDS & FEEDING
Level 3, 4, & 5

Members should be able to read and understand the information on a feed label/tag and be able to identify if the feed is considered a starter, finisher, or maintenance feed.

Feed tags provide important information about the nutrients and ingredients contained in a feed. All commercially prepared feed must include a label or tag. It's important to understand the information contained on a feed tag in order to be sure you're providing your animal with the proper nutrition for its needs. Livestock feeds are classified as complete feeds or supplements.

Complete Feed – feed that contains all of the nutrients required by an animal, except for water and hay or forage/grass. An example of a complete feed is beef grower or finisher. *Note that some "complete feeds" do not require additional feeding of roughage such as hay/forage. Be sure to read the feed label to determine if the feed you use requires the feeding of hay/forage.

Supplement – feed used with another feedstuff to improve the nutritive balance or performance of the total ration and intended to be fed (either) a) undiluted as a supplement of other feeds, b) offered free choice with other parts of the ration, or c) diluted and mixed to produce a complete feed," [11] (depending on the manufacturer's labeling). Supplements are products that are added or mixed into feed. They supply additional nutrients that your animal may need to grow and perform at its best. Supplements are usually added in small, specified amounts and are not fed as the total ration.

[11] "Feed Analysis: It's All About Energy", http://extension.psu.edu/animals/camelids/nutrition/feed-analysis-its-all-about-energy

Reading a Feed Label/Tag
Level 3, 4, & 5

Feed companies are required to provide certain information on every bag or package of product sold. The information is always listed on the label in the order it appears below.[12]

Product Name and Brand Name
Purpose of Feed – lists the species and animal class for which the feed is intended
Purpose of Medication and Active Drug Ingredients – if a drug is present in the feed, the word "medicated" must appear below the name of the feed with a statement and purpose of the medication, followed by a listing of the active drug ingredients and the amount of drug in the product
Guaranteed Analysis – gives information on the nutrients in the feed including the minimum percentages of 1) crude protein, 2) fat, and 3) fiber as well as 4) the minimum and maximum percentage of calcium, 5) the minimum percentage of phosphorus, 6) the minimum and maximum percentage of salt, and 7) the minimum Vitamin A in International Units (IU) per pound. This information is always listed on the feed tag in the same order as listed above. Additional guarantees may be included for other trace minerals, vitamins, specialty ingredients, or other nutrients depending on the product or species being fed.
Ingredient Statement – lists the ingredients in order starting with the ingredient that makes up the biggest proportion of the feed down to the ingredient that makes up the smallest proportion of the feed.
Feeding Instructions – include information on how much of the feed should be fed per day. If the feed is medicated and has a withdrawal time, a "warning" or precautionary statement is included as well.
Manufacturer Information – includes the name and address of the company that made or distributed the feed.
Net Weight Statement – tells how many pounds or kilograms of feed are in each bag.

[12] *Beef Resource Handbook*, The Ohio State University, 2011, 2001, 7.13,7-16

BEEF CATTLE NUTRITION
Level 3, 4, & 5

Beef cattle need certain nutrients every day in order to stay healthy and grow. The nutrients needed are: Water, Energy, Protein, Minerals and Vitamins.

Water is the most important nutrient. It helps the body function properly. Cattle will drink as much as 20 gallons of water a day. Water should be fresh, clean, and cool to encourage cattle to drink.

Energy includes carbohydrates and fats. Energy helps cattle grow and maintain their body condition. It also helps in calf development during pregnancy. Grain, such as corn, barley, wheat, and oats are high in energy. Starter feeds for cattle are generally lower in energy and fat (2.5-3.0% fat) than Finishing feeds (3.5 – 5% fat)

Protein helps to build muscle (meat) and helps with growth. Protein sources for cattle include soybean meal and cottonseed meal. Starter feeds for cattle are generally higher in protein (14% protein) than Finishing feeds (12% protein). Heifer feeds are generally higher in protein (14+% protein) to encourage growth.

Minerals help to build strong bones and teeth and are needed to make blood, muscle, and nerves. Some necessary minerals for cattle include salt, calcium, and phosphorus. Trace minerals are those that are needed in a small amount and include iron and copper. Commercial show cattle feeds contain the proper amount of minerals but cattle on pasture or rangeland should be supplemented with mineral blocks or tubs.

Vitamins help the body to function properly. Commercial show cattle feeds contain the proper amount of vitamins. Alfalfa hay and green grass are also good sources of vitamins.

See p.7.2-7.7, Beef Resource Handbook, Ohio State University Extension, 2011, 2001

BEEF CATTLE DIGESTION
Level 3, 4, & 5

Cattle, sheep, and goats are examples of ruminant animals. A ruminant is described as "an animal that has four stomach compartments – 1) rumen, 2) reticulum, 3) omasum, and 4) abomasum.

Ruminants, such as cattle, are able to digest large amounts of grass, hay, other roughages and low-quality feeds and transform that feed into muscle (meat) or milk. Because of their specialized digestive system, ruminants can make use of feeds that other animals and humans cannot digest. Ruminants swallow roughage before it has been completely chewed. The partially chewed food travels down the esophagus and enters the ***rumen***. Bacteria and other microbes found inside the rumen help to break down roughage and release the nutrients found in the feed. Later, the animal will regurgitate the food (the "cud") and continue to chew. The ***reticulum***, which is a part of the rumen, helps the animal digest feed by allowing it to be regurgitated so the animal can chew its "cud" before it is swallowed again. Chewing the cud helps the animal to further digest the food. The ***omasum*** helps in digestion by further breaking down the feed and squeezing the water out of it. The ***abomasum*** produces digestive juices that help further break down the food into usable nutrients and move it to the small intestine and then into the large intestine. The abomasum works much like a human's stomach.

Calves and other ruminants are born with a small rumen because the milk they drink is digested in the abomasum. As the calf grows, its rumen develops so that by the time the calf is three months of age, the rumen is well-developed, and the calf is able to digest roughages and other feeds efficiently.[13]

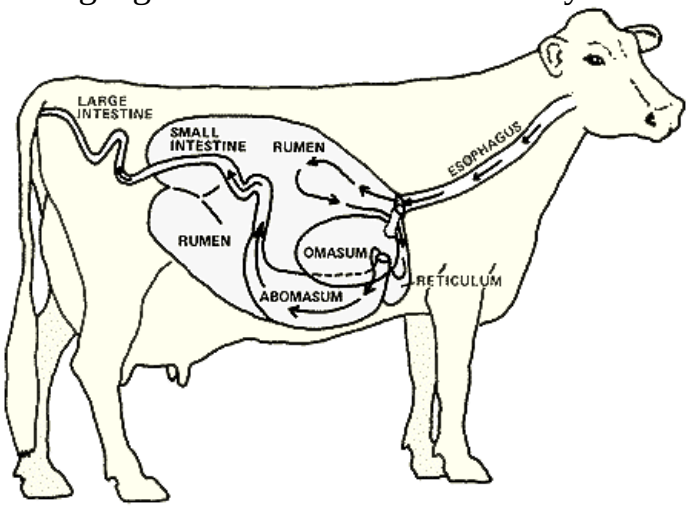


Image from http://sci.waikato.ac.nz/farm/images/ruminant%20digestive%20tract.png

[13] *Beef Resource Handbook*, The Ohio State University, 2011, 2001, 7.1-7.2

Beef Cattle Health and Management
Level 3, 4, & 5

Depending on area, environment, and exposure to other animals, beef cattle are susceptible to a number of parasites and diseases. A list of these can be found on pp. 5.3-5.6 of the *Beef Resource Handbook* but check with your cooperative extension agent or a veterinarian for diseases that are common in your area.

Knowing the symptoms of common cattle diseases is helpful, but preventing diseases and parasites is the most important way to keep beef cattle healthy. This can be done by:

- Keeping clean the area where cattle are housed and fed
- Providing proper feed and nutrition and clean, fresh water
- Properly vaccinating and deworming animals
- Using clean equipment for handling and doctoring animals
- Separating newly purchased animals from your existing animals for a period of time as recommended by your veterinarian

Being aware of any changes in your animals' appearance, eating habits, behavior, or manure will help you notice possible health issues that need to be addressed. With any medication or dewormer, it is important to read all labels for dosage, administration method (oral, injectable, paste, or pour-on) and withdrawal period. ***Withdrawal period*** or ***withdrawal time*** refers to the period of time that must pass between the last treatment of a medication and the slaughter of meat animals or the collection of milk from a dairy animal. The withdrawal period allows the medication to be eliminated from the animals' body so that the meat or milk does not contain unsafe residues for human consumption.[14]

Most medications are administered to an animal either orally, by injection, or topically (on the skin). It's important to read the label to learn which method to use. Learning where, when, and how to properly give an injection is an important skill to learn whether you are giving vaccinations or treating an illness. There are three different types of injections: Subcutaneous "sub cu" (under the skin), intramuscular "IM" (in the muscle), or intravenously "IV" (in the vein). Subcutaneous injections should be given under the skin in front of the point of shoulder. Intramuscular injections should be given in the neck region because all IM injections cause tissue damage which lowers the value of the carcass of a meat animal. See pp. 5.1-5.8,12.7-12.16, *Beef Resource Handbook*, Ohio State University Extension, 2011,

[14] *Beef Resource Handbook*, The Ohio State University, 2011, 2001, G-11

Suggested Beef Cattle Health Program
Level 1, 2, 3, 4, & 5

Market Steer

When purchasing an animal, members should ask the breeder/seller which vaccinations have been given and if any others are necessary. Listed below are suggestions for vaccinations that should be given to a steer:

- Vaccinate for Respiratory Complex with a product such as Titanium or Bovi Shield
- Vaccinate for Clostridial diseases with a product such as Vision 8

These vaccinations only need to be given once per year and are usually given to the steer before it is sold as a 4-H project. If your steer was not vaccinated by the breeder/seller, then it is best to vaccinate it soon after purchase.

In addition to the vaccinations, it's important to control internal and external parasites with a broad spectrum dewormer such as Cydectin or Dectomax. Ask the breeder/seller if the steer has been treated for parasites.

If a steer has been vaccinated and dewormed before the member purchases it, the only suggested health care is to treat the animal with a dewormer during the spring of the year. Before giving any medication or dewormer to your animal, read and follow the dosage, administration, and withdrawal requirements on the medication or wormer. Members should always consult a veterinarian with any questions about vaccinations and other beef cattle health concerns.

Breeding Cattle

Breeding cattle projects require a more extensive health care program because the animals are kept for a longer time. Included on the next page is a suggested program for breeding cattle and calves. Members should consult a veterinarian with any questions regarding beef cattle health concerns and always follow label instruction on medications and dewormers.

Suggested Beef Cattle Herd Health Program

Birth

- Selenium injection - BoSe
- Dip naval stump – betadine or mild iodine
- Optional – nasalgen - Enforce

Branding time - 3 to 4 months of age

- Vaccinate for Respiratory complex including PMH – MLV – with a product such as Vista Once or (Pyramid 5 & Presponse HM) or Titanium 5
- Vaccinate for Clostridium – with a product such as Vision 8 somnus
- Administer a multi mineral or copper boluses
- Deworm

Preweaning – 2 to 3 weeks prior to weaning

- Vaccinate for Respiratory Complex and 5 serotypes of Leptospirosis – with a product such as MLV – Titanium 5 L5
- Vaccinate for Clostridium – with a product such asVision 8
- Administer a multi mineral
- Deworm – with a pour on, paste, liquid or injectable product

Breeding Females –Yearling Heifers and Cows between Calving and Breeding

WARNING: Be sure that vaccinations are given at least 30 days prior to breeding

- Vaccinate for Respiratory Complex & 5 serotypes of Leptospirosis & Vibrio – with a product such as MLV – Vista 5 VL5 or Titanium 5 L5
- Vaccinate for Clostridium – with a product such as Vision 8
- Administer a multi mineral or copper boluses
- Deworm – with a pour on, paste, liquid or injectable product

Other Considerations for General Herd Health

- Mineral program – year-round provide a mineral supplement; during breeding season use a chelated product such as Four Fertility
- Fly control - late spring or early summer – use fly tags or a pour on product
- At pregnancy check time – give a booster vaccine with killed respiratory complex – with a product such as Virashield 6 L5

Suggested Beef Cattle Health Program information courtesy of Dr. Randy Perry, Animal Science Department, California State University Fresno

Suggested Bio-Security Practices for Beef Cattle Level 5

Biosecurity is defined as a series of management procedures and practices designed to prevent or greatly reduce the risk of introducing new infectious agents (diseases) to a farm. Biosecurity practices include monitoring and evaluation of animals for early detection of disease, screening and testing incoming animals, and some sort of quarantine or isolation procedure for newly purchased or returning animals. Good biosecurity practices help keep animals healthy and more productive as well as provide food products that are wholesome and high in quality.[15]

Several ways to prevent the introduction of infectious agents include:

- Separate from the herd newly purchased animals for 30-60 days.
- When visiting other farms or ranches, auctions, livestock shows, etc., thoroughly clean your clothes and shoes when you get home to avoid bringing disease organisms back to your property.
- Try to keep visitors and other animals out of your pens and pastures to avoid the introduction of disease organisms.

4-H members who exhibit animals at shows and fairs should use the following biosecurity practices before, during, and after the fair to keep show animals and the rest of the herd healthy:

- Only exhibit healthy animals; do not take sick animals to a show.
- Before you leave for the show and again before you return home, clean and disinfect all equipment including feeding, cleaning, and grooming equipment (feeders, buckets, pitchforks, wheelbarrows, clippers, brushes), as well as the trailer/truck used to haul your animal(s).
- Clean your animals before leaving home and again before you return home.
- Report any health concerns to the veterinarian at the fair.
- Avoid nose-to-nose contact of animals.
- Avoid sharing equipment unless it is disinfected between use on different animals.
- Avoid sharing water troughs with other animals.
- Minimize animal stress by keeping them cool and comfortable.

[15] https://extension.psu.edu/biosecurity-fundamentals

- If you are caring for animals at home as well as at the fair, change your clothes and shoes and wash your hands thoroughly before/after doing home chores.
- Dispose of all bedding and unused feed at the fair; do not bring it home.
- When you have returned home, separate show animals from the rest of the herd for 30 days and watch for signs of illness.[16] & [17]

Check with your 4-H leader or other knowledgeable livestock person, your Cooperative Extension agent, or your veterinarian for local disease outbreaks that may be a threat to your animals.

[16]http://cebutte.ucanr.edu/files/43144.pdf

[17]https://www.bah.state.mn.us/media/Biosecurity-for-Exhibitors.pdf

BEEF CATTLE
BREEDING AND REPRODUCTION
Level 3, 4, & 5

It is important to understand basic information about beef cattle breeding, reproduction, and management of a cow and calf:

- A heifer will come into heat (estrus) around eight months of age
- The heat period lasts from 14-20 hours
- The heat cycle repeats every 18-21 days until the heifer or cow is bred
- Selection of a bull to which to breed should be based on performance records of the bull and desired traits that you want in a calf
- Selection of a bull that is known to sire smaller calves at birth should be used to breed first-calf heifers
- Female cattle can be bred by natural service with a bull or by artificial insemination (A.I.)
- Gestation (pregnancy) for cattle is approximately 283 days
- Heifers and cows have special nutritional needs during gestation and lactation
- You should understand the signs and stages of calving and be prepared to help the female, particularly heifers, during calving
    - Dilation – the calf moves into the birth canal, contractions begin, the heifer or cow becomes restless and may try to go off by herself
    - Calving – the water bag will appear and break, the front feet of the calf should appear first, the heifer or cow will have hard, frequent contractions, she may lie down and stand up, paw the ground, and eventually push; the calf should be delivered within two hours after the water bag breaks; if this doesn't happen, contact a veterinarian or an experienced cattle person for help.
    - Discharge of the afterbirth – the placenta is usually expelled immediately after the calf is born; if this doesn't happen within 12 hours after the birth, contact your veterinarian.
- After calving, there are several steps that should be taken:
    - The heifer or cow will lick the calf to clean and stimulate it.
    - If the calf is having trouble breathing or getting up, clear the mucous from the mouth and nose and vigorously rub the calf with a dry towel.
    - The calf should get up and nurse within the first few hours after birth, but usually will nurse within 30-60 minutes.

- If the calf is weak and cannot nurse, it must be fed colostrum using a stomach tube. Contact a veterinarian or experienced cattle person for help.
- Dip the calf's navel cord in 7% iodine to protect it from infection
- A selenium injection is recommended to prevent white muscle disease.

See p.6.1-6.22, Beef Resource Handbook, Ohio State University Extension, 2011, 2001

Marketing and Selling Beef Cattle and Meat
Level 5

Sale of Beef Cattle

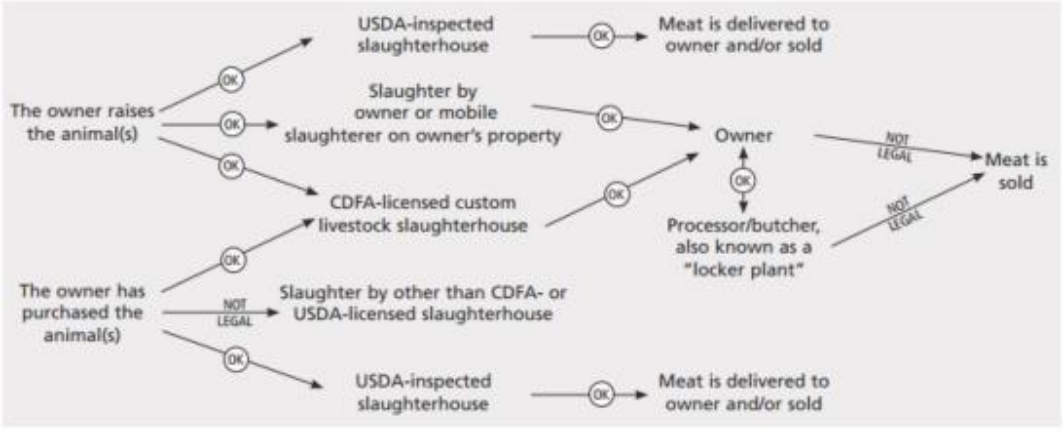
Whether a 4-H member raises a single beef animal or has a small herd of beef cattle, he or she should know the options for marketing and selling those animals. Knowing what type, age, size, breed, and condition-level of cattle is most desirable will help to create more profitable options at sale time.

- In many California counties, 4-H members can exhibit and sell their market beef cattle at the local county fair. Some county fairs also have replacement heifer classes and auctions. Members should research the entry requirements for their local fair.
- Breeding, market-ready, and feeder cattle can be sold at local livestock auctions that are held regularly throughout the state.
- High quality breeding cattle, both registered and unregistered, as well as high quality feeder cattle may be sold private treaty, online, or at consignment sales throughout the state and beyond.

Sale of Locally Grown Meat

Even though beef cattle are raised to produce meat, there are requirements and laws that regulate the sale of that meat. Livestock (cattle, sheep, goats, pigs) must be harvested (slaughtered) at a USDA facility and cut & wrapped at a USDA facility in order to be sold to the public. There are various labelling, handling, and storage requirements that must be followed when selling meat. Farmers markets are another outlet for selling meat, but the meat must be processed, labeled and stored following USDA and CDFA guidelines specific to farmers market sales. Information regarding USDA and CDFA slaughter facilities and guidelines can be found online at: http://ucanr.edu/sites/CESonomaAgOmbuds/Selling_Meat/ [18]

The county agricultural commissioner and the local University of California Cooperative Extension are also good resources for local, state, and federal regulations regarding the sale of meat. Because the laws change, sellers should make sure that the information they obtain is current and up to date. See the diagram below to understand where and how livestock must be harvested and processed in order to be eligible for retail sale in California.



[18] http://ucanr.edu/sites/CESonomaAgOmbuds/Selling_Meat/

Beef Cattle Slaughtering and Carcass Evaluation Level 5

As a 4-H member involved in the Beef Cattle Project, you are a part of the livestock industry. The livestock industry provides a product to the consumer. In the case of beef cattle, you provide meat and the many by-products of cattle. If you have a breeding animal, you are producing future food for the consumer. Everyone involved in the livestock industry has a responsibility to provide a safe, wholesome product to the consumer and to treat their livestock in a responsible, humane way from birth through slaughter.

In order to sell meat to someone who did not raise the animal, slaughtering and processing of the animal must be done in a United States Department of Agriculture (***USDA***) inspected facility. It's important that the animals are handled quietly and correctly to ensure the well-being of the animal and to keep from damaging the meat of the animal. The animal must be inspected while in motion and at rest, and for any signs of disease that would make the animals unfit for humans to eat.

After the live inspection, the animals are slaughtered following the Humane Methods of Slaughter Act of 1978 which includes stunning the animal which makes it unconscious; hanging the animal by its rear legs (shackling); bleeding out of the animal; removing the hide (skin), feet, and head; removing the internal organs, except the kidneys and surrounding fat; splitting the carcass down the middle of the backbone; trimming of any bruises or foreign material such as bits of hide or hair (at this point, the carcass is considered "dressed"); inspection of the carcass and internal organs by a USDA inspector; weighing of the carcass; washing of the carcass; spraying of the carcass with lactic acid to prevent bacteria or other contamination; stamping of the carcass with the USDA stamp; rapid chilling to 44.6 degrees Fahrenheit; and aging of the carcass.[19] ***Aging*** is the process of hanging a beef carcass in a cooler for a period of time, usually 3-14 days, allowing the enzymes in the muscle to breakdown, making the muscle (meat) more tender. Aging the beef carcass makes the beef more tender and allows the flavor of the beef to concentrate and intensify due to the loss of moisture in the meat, resulting in a more tender, tastier piece of meat. Generally, the more fat there is on a carcass, the longer it can be aged without drying out. High quality, choice and prime beef carcasses can be aged for longer than 14 days. By following these steps, a packing plant (slaughter facility) can ensure that the meat it processes is safe for the consumer.[20]

Carcass evaluation is an important part of determining the success of beef cattle production. The goal of a market beef cattle project is to produce a wholesome, high-quality carcass that has a high degree of ***cutability*** (the amount of red meat in a carcass). A carcass with high cutability

[19] California State University of Fresno, Meats Lab 2018

[20] https://extension2.missouri.edu/g2209#effect

would have a high percentage of meat compared to fat. ***Yield grades*** are used to evaluate the cutability or amount of red meat in a carcass (Yield grade 1,2,3,4,5, with Yield grade 1 having the most meat and least fat.)

The yield grade is based on 4 factors:

1) The amount of external fat on a carcass, measured at the 12th rib, over the rib eye muscle. The normal range of fat thickness is 0.35-0.50 inches;
2) The area of the rib eye muscle, which ranges from 10-18 square inches, with 12 square inches being the average;[21]
3) The hot carcass weight, which averages 62% of the live animal's weight;
4) The amount of kidney, pelvic, and heart (KPH) fat as a percentage of hot carcass weight. The KPH average is 2.5% of the carcass weight.[22]

In addition to a yield grade, a carcass receives a ***quality grade*** when it is evaluated. A quality grade predicts tenderness, juiciness, and flavor based mainly on muscling and fat distribution. The USDA quality grades for young beef cattle, under the age of 30 months, are Prime, Choice, Good, and Utility. Beef cattle producers strive to produce Prime or Choice graded carcasses.

Dressing percentage is the weight of the dressed carcass divided by the live weight of the animal multiplied by 100. For example, if a live steer or heifer weighing 1300 pounds, has a dressed carcass weight of 800 pounds, the dressing percentage would be 810/1300 = .62x100=62%. The average dressing percentage for beef cattle is 62%.

Finish refers to the thickness and distribution of external fat directly over the top of the two rib eye muscles at the center of the longissimus muscle. Fat helps to keep the carcass from drying out and provides flavor and juiciness to the meat.

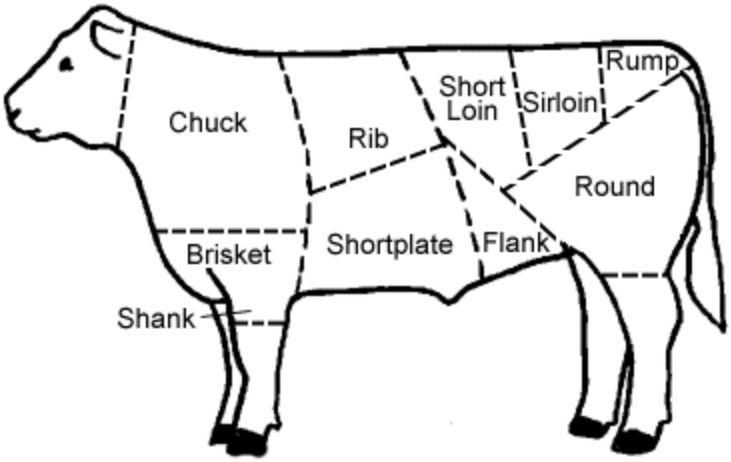
Measurement of the ***rib eye area*** is taken between the 12th and 13th rib. The rib eye area can be used to indicate the amount of muscle in the carcass. The average size of the rib eye of a beef carcass is 12 square inches.

For more information on beef slaughter and carcass evaluation, see Beef Resource Handbook, Chapter 8, written by the Ohio State University Cooperative Extension, available for purchase at the Fresno County 4-H Office.

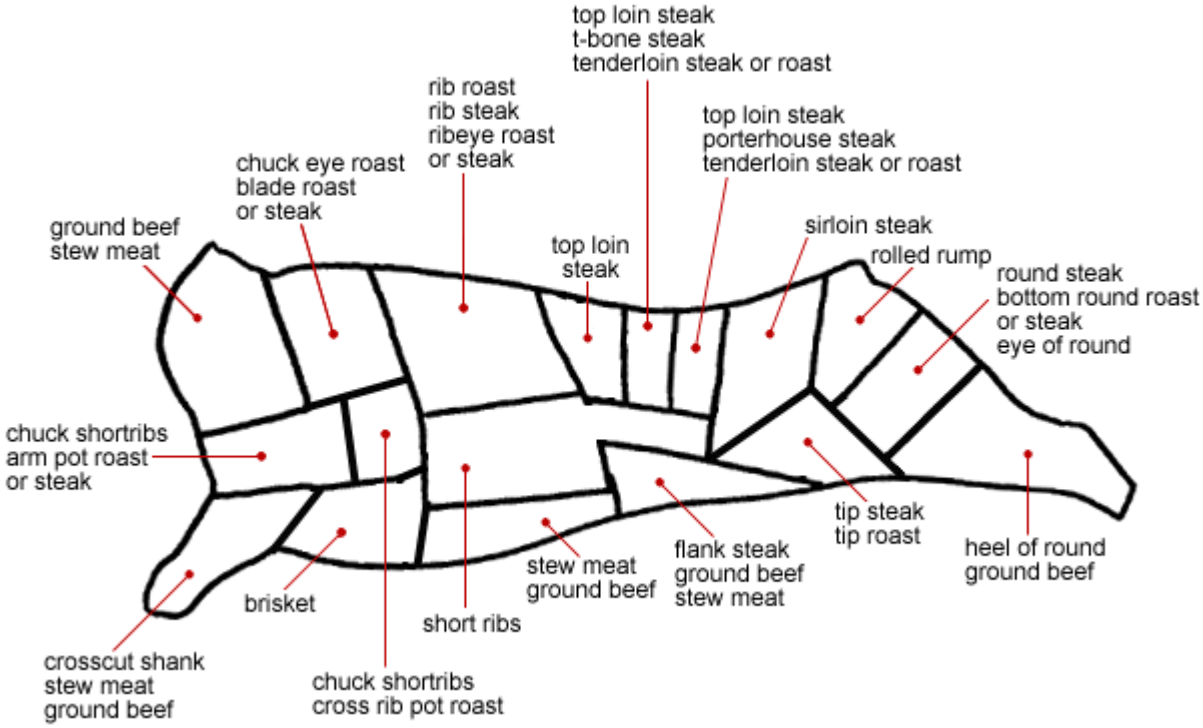
[21] https://www.sdstate.edu/agriculture-biological-sciences/animal-science/beef-grading

[22] *Beef Resource Handbook*, The Ohio State University, 2011, 2001

WHOLESALE CUTS OF BEEF
Level 2, 3, 4, & 5



RETAIL CUTS OF BEEF
Level 4 & 5



Cooking Beef
Level 5

Beef cattle are raised for meat production, therefore, it's important to understand the various cuts of beef and the methods best used to cook those cuts.

There are two basic methods of cooking meat:

- Moist heat
- Dry heat

Less tender cuts of meat require moist heat cooking methods to help break down the tough connective tissues. Moisture/liquid is added to the meat and the meat is cooked at a low temperature over a long period of time. Braising and stewing are two types of moist heat cooking methods.

Tender cuts of meat are usually cooked with a dry heat method. Tender cuts are usually cooked at a high temperature for a short period of time. Roasting, broiling, pan frying, and grilling are the most common types of dry heat cooking methods.

The method chosen to cook a certain cut of meat relates directly to the tenderness of that cut. Tenderness is determined by:

- from where on the animal the meat comes,
- the degree of marbling,
- the age of the animal,
- how the meat was stored, and
- how the meat was prepared for market.

In general, cuts from the loin section are the most tender; the farther away from this section the less tender the meat will be.[23]

Cooking Temperature

You can't see, smell, or taste harmful bacteria that may be in or on raw meat, but bacteria can cause illness. To ensure that the bacteria have been killed, raw meat must be cooked to a minimum safe temperature. Cook all raw beef, pork, lamb and veal steaks, chops, and roasts to a minimum internal temperature of 145 °F as measured with a food thermometer before removing meat from the heat source. Cook all raw ground beef, pork, lamb, and veal to an internal temperature of 160 °F as measured with a food thermometer.[24]

See pages CP-15, Beef Resource Handbook, Ohio State University Extension, 2011, 2001

[23] http://www.four-h.purdue.edu/foods/cooking%20meat%20and%20poultry.htm

[24] https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/safe-food-handling/keep-food-safe-food-safety-basics/ct_index

The California Beef Cattle Industry
Level 5

California ranches consist of one or more of four types of operations: cow-calf, seed stock, stocker, and feedlot.

A cow-calf operation maintains a breeding herd of cows, replacement heifers (young females) and bulls. Steer calves and most heifer calves are sold, but some may be selected to enter the breeding herd. Calves are sold at weaning (typically 205 days of age) or are retained for an additional forage production season as stockers. Climatic and management conditions dictate different calving seasons in different regions.

These cattle are typically purebred British or Continental breeds or a cross of several beef breeds, known as a composite. Though the list of breeds is quite long, some of the more recognized beef cattle breeds are Angus, Hereford, Charolais, Brangus, Maine-Anjou, Simmental, Limousin.

Seedstock production is a specialized cow-calf operation that produces purebred or registered cattle. The goal of seedstock production is to make genetic improvements in cattle that benefit the entire beef industry. Improvements in purebred cattle are documented through extensive records maintained by both the individual rancher and breed organizations. Seedstock are marketed as bulls and replacement females to other seedstock producers or to cow-calf producers.

Cattle that are not purebred are referred to as commercial cattle. Often times, commercial cattle or registered composite cattle are bred to have the qualities of two or more breeds.

Stocker operations grow steer and/or heifer calves or yearlings on rangeland or other roughage. Generally, cattle are purchased following weaning in the fall and are wintered on low quality feed until new grass can support the animals' nutritional requirements. Stocker cattle are normally marketed or transported to feedlots at the end of the grazing season when nutritional quality of the forage begins to decline.

Feedlots (or feedyards) are facilities designed to meet the feed, water and care requirements of large numbers of cattle. Beef fed solely roughage feeds take longer to reach market weight and condition, and land resources in the U.S. are insufficient for a forage-based beef supply at the current level of consumer demand.

Feedlots utilize abundant sources of feed grains and by-products to efficiently feed large numbers of cattle. These higher energy feed sources greatly reduce the time required to reach market weights. By feeding cattle in feedlots, finished cattle weighing 1,050 to 1,150 pounds can be marketed at 18 to 24 months of age. Most of California's feedlots are located in the lower Sacramento, San Joaquin and Imperial Valleys.

Once the top cattle feeding state in the nation, California's feedlots have declined in number over the last several decades due to overregulation and the exodus of beef processing facilities from the state. Still, there are over 500,000 cattle fed on California feedlots.

Something that makes California's feedlot sector unique is that many of the cattle on these operations are not traditional beef breeds. Because of California's large dairy industry, many of the steers sent to feedlots in the Golden State are of dairy herd genetics, predominantly Holstein. Though these cattle take longer to feed to slaughter weight because Holsteins are not as fleshy as beef breeds, Holstein cattle grade well and can be as high quality as traditional beef breeds. Holstein cattle make up a significant portion of U.S. beef.

Image and information from http://www.calcattlemen.org/cattle_101/how_cattle_are_raised.aspx

BEEF CATTLE
GROOMING, FITTING, & SHOWMANSHIP SKILLS

Level 1

Member should be prepared to demonstrate knowledge of the following skills:

- Tie and untie steer correctly
- Lead steer into and out of blocking chute correctly
- Brush steer to work hair correctly
- Walk steer
- Set up legs
- Use of show stick
- Use of Scotch comb in show ring
- Where to stand in relation to the judge

Level 2

Member should be prepared to demonstrate knowledge of the following skills:

- All Level 1 skills
- Where to clip on a market steer
- Proper use of electric blower
- Setting up steer in profile pose
- Setting up steer when viewed from behind

Level 3

Member should be prepared to demonstrate knowledge of the following skills:

- All Level 1 & 2 skills
- Show Day Fitting

Level 4 & 5

Member should be prepared to demonstrate knowledge of the following skills:

- All Level 1, 2, & 3 skills
- Clipping

Resources:

Beef Resource Handbook, The Ohio State University, 2011, 2001, 9.1-9.20
https://www.youtube.com/results?search_query=beef+cattle+fitting
https://www.youtube.com/results?search_query=beef+cattle+showmanship

In addition to being knowledgeable about fitting and showing beef cattle, members at all levels should understand and practice good show ring and livestock management ethics.

See pages 12.19 – 12.24, Beef Resource Handbook, Ohio State University Extension, 2011, 2001

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http://www.four-h.purdue.edu/foods/cooking%20meat%20and%20poultry.htm

http://www.hereford.org

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https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/food-labeling/meat-and-poultry-labeling-terms/meat-and-poultry

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