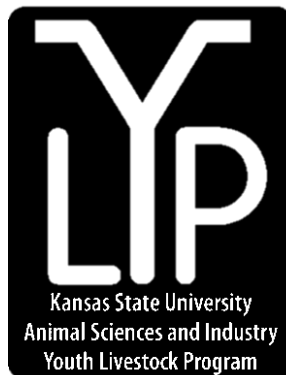


2018
Kansas Junior
Beef Producer Day
Educational Materials



Youth Livestock Program • Kansas State University
214 Weber Hall • 1424 Claflin Road • Manhattan, KS 66506

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Contributions

Special thanks to these people for their contributions to the Junior Beef Producer Day program and this educational resource.

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Selecting Your Youth Beef Project

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Success in the show ring is generally a result of proper selection, excellent management, experience, and a little luck. Beef cattle selection is not an exact science and usually requires some training. It is important to understand the anatomy of both the live animal and carcass and its terminology. A good evaluator of livestock has a keen sense of observation and is able to relate form to function.

Selection of the beef animal should be based on a few general criteria. Regardless the purpose (market vs. breeding), “**structural soundness**” is very important for proper growth, reproductive performance, and animal longevity. Animals that demonstrate structural defects will have impaired mobility, pain, and unsoundness that can lead to decreased performance. Structural problems can be caused by either genetic or environmental factors. To fully understand structural correctness, one should be familiar with the skeleton of animals and the correct angulation to the joints.

Skeletal correctness is best evaluated from the ground up. Proper foot and hoof development is necessary and serves as a foundation to the skeleton. The pasterns of livestock serve as one of the shock absorbing mechanisms to both the front and rear limbs. The ideal slope to the pastern should fall around 45° - 47°. As the pastern becomes straighter (approaching 90°) it has less of a cushioning effect when the hoof hits the ground. The ideal front limb should have a long, sloping shoulder. The angle to the scapula should be approximately 45° to the ground, which is similar to the correct angle through the pastern. As the scapula becomes more vertical (approaches 90°) the length of step out of the front end is shortened. In most cases, straight pasterns and straight shoulders go hand in hand.

Structural soundness of the hind limb is critical to the function of breeding animals, especially the males. The length of step associated with the hind leg is dependent upon the angle of the femur bone, hock joint, and pastern. The simplest way to evaluate the structure of the hind leg is to drop a line from the pin bone down through the cap of the hock to the ground. This line should be perpendicular to the ground and a correctly structured hind leg will be parallel to that line. Common defects of the hind limb include a post-legged condition (too straight) or sickle hocked (too much set).

Most cattle breeders in the United States prefer a straight, level top line. The hip should be long and nearly level from hooks to pins, with a wide pin placement. Keep in mind some breeds of cattle (i.e. Brahman influenced) naturally have a sloping rump. This may not be considered “ideal” but rather a breed characteristic.

A second selection criteria includes “**body capacity**” and is typically evaluated with a three dimensional view. These dimensions include the depth of rib, spring of rib, and length of rib cage or length of body. Body capacity is important to both market cattle and breeding animals alike and generally indicates the animal’s ability to convert feedstuffs to fleshing ability.

All meat animals, regardless of the classification (market vs. breeding) should display some degree of “**muscling**”. Of course, more emphasis will be placed on muscling in market animal classes. The best indication of muscling should be evaluated through the hind quarter from a rear view. A muscular shaped beef animal should have a thick, square rump with a wide pin bone placement. Muscle thickness should be maintained through the center and lower parts of the rear quarter, requiring some shape or bulge to it. The next best indication of muscling can be seen along the animal topline. Be cautious and do not confuse fat with muscle. A heavy muscled animal will be thick just behind the shoulder (back) and demonstrate a full, muscular shaped loin. A light muscled animal will be narrow topped, in particular they will be pinched just behind the shoulder.

Traits associated with “**sex character**” (femininity and masculinity) are also important to consider when selecting a breeding animal. A heifer regarded as feminine will have a fairly long, refined head, a neck that is long, lean, and free of excess waste and a flat smoothly blended shoulder. The bone work should be flat, and clean joints that are free of swelling. Of course, some body condition (fat) is acceptable, but heifers that are too fat are considered unfeminine and nonproductive in their appearance. Bulls should be masculine and this includes a stouter appearance and large testicle size. The minimum scrotal circumference for most breeds of cattle at one year of age is 32 cm.

Today “**frame size**” is the least important trait to consider. The term frame size includes both length and height, of which length is the most important. It is important for an animal’s mature frame size and weight fit the environmental they will be placed in. In other words, as mature size increases, so does the nutrient requirements for maintenance.

It is important to keep the general picture of form and function in mind when selecting your next show animal. Never become single trait minded and be cautious when selecting for extremes. The animal with the best combination of structural correctness, body volume, sex character, muscling, and correct frame size should prove to be the winning kind.

Selecting Your Next Show Heifer to Be a Great Cow

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For many junior livestock participants, the purchase of a breeding heifer is a significant investment in the future. Breeding projects are meant to serve a number of goals. First, they enable the junior livestock exhibitor to learn more about the commercial and seedstock sectors of the beef industry. Second, these projects foster the development of beef cattle husbandry skills including feeding, nutrition, genetics, reproductive physiology and visual appraisal. Third, the heifers are typically selected for conformational attributes viewed to be desirable in the show ring. Fourth, the heifers are retained as breeding females to build a cow herd that will help finance many youth's college education. It's easy for the visual appraisal component to dominate the selection decision when evaluating a group of heifer calves for purchase. However, if your goal includes keeping that heifer as a breeding female to produce seedstock or other heifer or steers suitable for future projects, some care should be taken to evaluate the genetic merit for a number of economically important traits. The tools you should use to judge the genetic merit of a selection candidate are Expected Progeny Differences (EPD).

What are EPDs?

EPDs are estimates or predictions of the difference in performance that are expected to be observed between the average performance of sire progeny groups for a given trait when given an equal opportunity to perform. EPDs are relative measures of genetic merit and allow the effective comparison of animals across herds. EPDs are the most effective selection tool available. Research suggest that EPD are 7 to 9 times more effective as predictors of genetic merit than an animal's actual or adjust performance record or within contemporary group ratio.

While EPDs are not the only selection information you should consider, EPDs are the most effective tools available to describe the genetic differences between animals within and across herds. EPDs are much more effective genetic predictors than actual or adjusted performance records. If an EPD is available for a trait it should be used instead of an animal's own performance record for that trait. The EPD removes age and environmental effects that can bias a decision based on actual or adjusted performance records. Use Calving Ease (CE or CED) EPD, rather than birth weight (BW) EPD, if it's available to select bulls that minimize calving difficulty. CE EPD calculations include BW data and other sources of information that affect dystocia.

Not all EPDs are the same, so make sure you know the appropriate information for the breed of cattle you are purchasing. For a useful reference on EPDs and other genetic topics see the Beef Sire Selection Manual (<http://www.nbcec.org/producers/sire.html>) Obtain the breed average EPDs and a percentile rank table available from the most current genetic evaluation for the breed of interest. Percentile rank tables can be found on most breed association websites but the current Angus (non-parent females) and Simmental percentiles are included at the end of this document. These tools will enable you to compare the relative genetic merit of individual animals to other animals in the breed.

Finally, not all EPDs should be used for selection of replacement or breeding females. Some traits like marbling score, carcass weight, or terminally oriented selection indexes focus on progeny performance for marketing endpoints. These traits are not economically relevant to a replacement selection decision. Traits that affect a cow's ability to conceive a calf, give birth to the calf with no dystocia, rear that calf to weaning and do it year after year are the traits of importance. A list of suggested traits to consider when purchasing a heifer is listed below. Setting criteria for lots of traits rather than just a few important ones dilutes your selection intensity and often clouds your decision making ability.

Trait Definitions for EPD to Consider in Heifer Selection

(Adapted from Cowley, 1998; <http://simmental.org/site/index.php/genetic-evaluation/epds>)

Calving Ease Direct - Predict the average difference in ease with which a sire's calves will be born when bred to first-calf heifers. Expressed as percentage of unassisted births with a higher value indicating greater calving ease.

Calving Ease Maternal - Predict the average ease with which a sire's daughters will calve as first-calf heifers when compared to the daughters of another sire in the same evaluation. Expressed as percentage of unassisted births.

Weaning Weight - Weaning Weight EPDs are expressed in pounds and predict the average differences in weight that can be expected between the progeny of animals in the same genetic evaluation at 205 days of age. Weaning Weight EPDs do not account for differences in weaning weight that are due to milk.

Yearling Weight - Like Birth and Weaning Weight EPDs, Yearling Weight EPDs are expressed in pounds and predict the average differences that can be expected between the progeny of animals at one year of age.

Milk - Milk EPDs are expressed as pounds of calf weaned by a bull's daughters. They reflect the average differences in weaning weight that can be expected in grand-progeny due to the milking ability of a bull's daughters. Available feed resources will dictate the extent to which milking ability should be selected.

Total Maternal (Maternal Weaning Weight) - Like Milk EPD, Total Maternal EPDs are also measured in pounds of calf weaned by an animal's daughters. They account for average differences that can be expected from both weaning weight direct as well as from milk, and measure a sire's ability to transmit milk production and growth rate through his daughters. They are calculated by adding an animal's Milk EPD to one-half of its Weaning Weight EPD.

Heifer Pregnancy - Predict the additional percentage of heifer progeny that conceived a calf during a specified breeding season.

Docility - Predict the percentage of an animal's offspring that are expected to score favorably (1 or 2) on a five-point scoring system when compared to the offspring of another animal. Expressed as a percentage with higher values being favorable

Stayability - Expressed as the probability that an animal's daughters will remain in production to at least six years of age when compared to the daughters of another animal. A measure of sustained fertility that probably reflects traits such as fleshing ability and structural soundness. Expressed as deviations from a 50% probability, a higher value indicates increased stayability.

Percentile Breakdown
American Angus Association Spring 2016 Non-Parent Cows

Top Pct	Production						Maternal		\$Values	
	CED	BW	WW	YW	DOC	HP	CEM	Milk	\$EN	\$W
1%	16	-2.6	69	120	32	20.4	16	34	30.29	74.27
2%	15	-2.1	66	116	30	19.5	15	33	23.58	70.08
3%	14	-1.8	65	114	29	18.8	14	32	19.30	67.46
4%	13	-1.5	64	112	28	18.3	14	31	16.36	65.53
5%	13	-1.3	63	111	27	17.8	13	31	14.28	64.05
10%	11	-0.7	60	106	24	16.4	12	29	7.91	59.08
15%	10	-0.3	58	103	23	15.4	11	28	4.22	55.92
20%	9	0.1	56	100	21	14.6	11	27	1.59	53.57
25%	9	0.3	55	98	20	13.9	10	26	-0.57	51.56
30%	8	0.6	54	96	19	13.2	10	26	-2.53	49.77
35%	7	0.8	53	94	17	12.6	10	25	-4.31	48.11
40%	7	1.0	51	92	16	11.9	9	24	-5.92	46.56
45%	6	1.2	50	90	15	11.4	9	24	-7.49	45.05
50%	6	1.4	49	89	14	10.8	8	23	-8.90	43.53
55%	5	1.6	48	87	13	10.2	8	23	-10.34	42.01
60%	5	1.8	47	85	12	9.6	8	22	-11.90	40.42
65%	4	2.0	46	83	10	8.9	7	21	-13.53	38.74
70%	3	2.2	45	81	9	8.2	7	21	-15.18	36.98
75%	3	2.4	43	79	7	7.4	6	20	-16.85	34.99
80%	2	2.7	42	76	6	6.6	6	19	-18.95	32.79
85%	1	3.0	40	72	4	5.6	5	18	-21.24	30.16
90%	0	3.4	37	68	1	4.4	4	17	-23.95	26.58
95%	-2	4.0	33	60	-3	2.5	3	15	-27.98	21.10
Total										
Animals	96,338	100,290	100,290	100,290	18,125	13,621	96,338	100,290	102,282	102,282
Avg	6	1.4	49	87	13	10.5	8	23	-8.16	43.13

American Simmental Association
Purebred Simmental Percentile Table--Spring 2016

%	CE	BW	WW	YW	MCE	MLK	MW	STY	DOC	API
							W			
1	17	-2.4	84	128	16	33	68	28	16	159.7
2	16	-1.9	82	124	16	31	66	28	15	155.1
3	16	-1.6	80	121	15	31	65	27	15	152.2
4	15	-1.4	79	119	15	30	64	27	15	150.0
5	15	-1.2	78	118	14	29	64	26	14	148.3
10	14	-0.5	75	112	13	28	61	25	14	142.2
15	13	-0.1	73	108	13	27	60	24	13	138.1
20	12	0.3	71	105	12	26	59	23	13	134.9
25	11	0.6	69	103	11	25	58	23	12	132.1
30	11	0.9	68	100	11	24	57	22	12	129.6
35	10	1.1	67	98	11	24	56	22	12	127.3
40	10	1.3	65	96	10	23	55	21	11	125.0
45	9	1.6	64	94	10	22	54	21	11	122.9
50	9	1.8	63	92	9	22	53	21	11	120.8
55	9	2	62	90	9	21	53	20	10	118.7
60	8	2.3	61	88	9	21	52	20	10	116.6
65	8	2.5	60	86	8	20	51	19	10	114.4
70	7	2.7	58	84	8	19	50	19	10	112.1
75	7	3	57	82	7	19	49	18	9	109.5
80	6	3.3	55	79	7	18	48	18	9	106.7
85	5	3.7	54	76	6	17	47	17	8	103.5
90	5	4.1	51	72	6	16	45	16	8	99.4
95	3	4.8	48	67	5	14	43	15	7	93.3
Avg	9	1.8	63	92	9	22	53	21	11	120.8

Nutrition Nuggets for the Beef Animal

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Nutrition is one of the important components of a successful 4-H beef project. **Nutrition** is the process in which animals consume, digest, absorb, and use food for maintenance, growth, fetal development or milk production. **Nutrients** are the components of feeds that have specific functions within the animal to meet important metabolic processes. Nutrients include energy sources (sugar, starch, cellulose, fat), protein, minerals, vitamins, and water. Feeding costs are a large but necessary expense in managing beef cattle, so understanding how cattle gain and the nutrients they require will make the most “bang for your buck” so to speak.

Nutrient requirements for varying levels of performance have been researched for years and the requirements are published by the National Research Council. These recommendations have been determined to be accurate for groups of cattle, but for your individual animal, if you are not happy with performance then consider making minute changes to protein, minerals, and vitamin levels. Cattle require nutrients in actual amount (weight) so some math will need to be used to determine if a commercial feed and/or your hay supplement are providing enough of the individual nutrients. When determining the actual amount of nutrients offered in feed an estimate of dry matter needs to be determined. The nutrients are located in the dry part of the feed and are called dry matter (DM). Dry matter is determined by taking a sample of the feed and drying it until there is zero moisture remaining. In general most dry feeds contain 7 to 13 percent moisture while molasses is 25% water. You can also gather exact dry matter by sending your feed to a testing laboratory or with the permission of your parents, placing a sample in an oven or microwave. Before trying to determine the dry content of your feed at home, research specific methods to determine dry matter content, and then follow directions.

Energy is very important for growth and fat deposition for all cattle. Energy is reported as total digestible nutrients (TDN) or net energy (NE). Net energy is further broken down into net energy for maintenance (NEm) or net energy for gain (NEg). As the names indicate, NEm tells you how many calories (energy) need to be supplied for maintenance (no change in weight or body fat), while NEg indicates the calories that will be used for putting on weight and body fat. Unfortunately, when reading the commercial labels for most feeds, they do not provide values for energy, but if you are concerned about this value, take a sample of your feed and submit to a laboratory for feed analysis. This will provide energy values for your feed and can help with determining how much to offer to your cattle to meet your goals. Energy from feed ingredients is often split into two categories: concentrate and roughage. Concentrate is typically very high energy grains with starch while roughage is typically hays or “hulls”.

Protein is measured as crude protein (CP). It is expressed as a percentage and for all commercial rations will be listed in the nutrient profile. Protein is required to aid in rumen microbial digestion, maintenance of feed intake and lean growth. Protein sources vary in location of digestion within the animal and understanding the basics about protein digestion will help provide the requirements for successful growth and “look” for your show animal. Protein sources offered to cattle will first have to feed the rumen microbes. Feed protein that is digested by the rumen microbes is called rumen degradable protein (RDP). Once the rumen microbes digest the protein they generate microbial crude protein (MCP) in the rumen that then gets passed through the rest of the stomachs to the small intestine where it is finally used by the animal as a protein source. Microbial crude protein, if the rumen environment is balanced, is an ideal protein source for the ruminant. This is the reason why in ruminant nutrition we say “Feed

the rumen microbes first”. Another form of protein is by-pass protein or rumen undegradable protein (RUP). This protein passes through the rumen without digestion by the microbes and then can be used by the animal in the small intestine. Small amounts of by-pass protein have been shown to help with cattle performance. However, it is MOST important that nearly 80% of the protein offered to the animal is rumen degradable. In general protein from grains, fresh grasses, and hays are primarily rumen degradable, while by-product feeds are about 50% by-pass protein. Non-protein nitrogen (NPN) is essentially 100% rumen degradable if adequate energy is supplied in the diet.

From a mineral perspective, there are two broad classes of minerals; macrominerals which are fed at higher levels and micromineral which are fed at lower levels. Calcium and phosphorus are the two primary macrominerals that need to be included and balanced in the diet. Both of these are involved in bone development and many other body functions. Important microminerals include selenium, zinc, copper, and magnesium. These are important for the “healthy look” of the cattle and for reproduction in heifers. Amounts of these minerals will be listed on the feed tag.

Understanding Feed Label

Since it is important to make sure nutrient requirements are met, reading and understanding a feed label becomes a must for feeding success. Some basics to help with understanding your feed label include understanding that the values reported on the label are described on an “as-is” basis. Within the feed label, the amounts of important nutrients will be listed. For example, crude protein is listed as a percentage, whereas zinc is listed as parts per million (ppm). This becomes important so that you can accurately calculate the appropriate protein and minerals to offer your cattle. Antibiotics and ionophores are also listed on your feed label along with proper feeding directions associated with these ingredients. The final component of the feed label includes the list of ingredients. These are reported as the ingredient with the highest inclusion amount to the lowest. This in turn tells you predominantly what ingredient is being offered to your cattle. An example of a feed label is shown in figure 1.

Figure 1: Example of a feed label.
CAUTION...this is completely made up and by no means is an actual label or recommendation to feed to any cattle!

Net Weight 50 lbs (22.68 kg)	
Farney's Fine Heifer Feed	
PURPOSE	
Feed to growing replacement heifers for exhibition	
* ACTIVE DRUG INGREDIENT *	
Monensin.....	X gnyton
* GUARANTEED ANALYSIS *	
Crude Protein (min.).....	16.00%
Crude Fat (min.).....	3.20%
Crude Fiber (max.).....	10.00%
Calcium (min.).....	0.75% (max.).....1.00%
Phosphorus (min.).....	0.85%
Salt (min.).....	0.50% (max.).....1.00%
Copper (min.).....	0.75% (max.).....1.00%
Selenium, ppm, (min.).....	22
Vitamin A, IU/lb (min.).....	150,000
Vitamin D, IU/lb (min.).....	12,000
Vitamin E, IU/lb (min.).....	60
* INGREDIENTS *	
Cottonseed hulls, corn by-products, corn, beet pulp pellets, molasses, fat products (feed grade), ferrous sulfate, manganous oxide, zinc sulfate, vitamin E supplement, vitamin A supplement, copper sulfate, sodium selenite, calcium iodate, and cobalt carbonate.	
* FEEDING DIRECTIONS *	
Feed at a rate of 1 to 2% of body weight along with free choice good quality hay. Provide ample feeder space and plenty of clean, fresh water at all times.	
* CAUTION *	
Read me because I am very important!! Especially since some feeds can't be fed in the same pasture as horses and sheep.	
Manufactured by Farney's Fake Extension Mill Anytown, US 00000	

Feed Ingredients

Grains – These feed ingredients are high in energy and will fatten cattle. The most common grain included in cattle diets is corn. Processing of corn increases the digestibility and the most common processed corn fed to ruminants is cracked, rolled, and steam flaked. Processing of the grain allows the rumen microbes greater access to the starch for microbial digestion. In a finishing ration, corn can be included between 42 to 58% of the total ration. Whole shelled corn can be fed to calves weighing up to 450 pounds because they can digest this grain efficiently but at heavier weights, processing will result in greater average daily gains.

Sorghum grain provides energy, but must be processed prior to feeding since the external seed coating is restrictive for the rumen microbes. Properly processed grain sorghum can replace corn, pound-for-pound in the ration.

Oats are another excellent grain source for steers and heifers. Oats offer energy and fiber therefore providing a dual purpose feed source. One issue with oats is the cost for the grain sometimes makes feeding of oats cost prohibitive. An alternative mixture that provides equal nutrition as oats and often is a cheaper alternative is 70-75% corn, 15-20% cottonseed hulls, and 10-15% cottonseed meal.

Barley and wheat are other grain options to feed to cattle. Barley can be used to replace up to 50% of the corn or sorghum in the ration. Barley is often included because of perception of improving handle on finished cattle. However, water consumption and thus moisture content of tissues plays a larger role in handle than feeding of barley. Wheat is a very high energy feed but is difficult to feed because of the potential for acidosis and bloat. Barley also is a high risk bloating grain when fed at high levels of the diet.

Protein Supplements - Common protein supplements fed to cattle include many grain by-product feeds. Typically a by-product feed has had the energy components removed for other industrial uses and what is left over is high protein, high fiber feeds that make great supplements for cattle. Examples of high protein feeds include soybean meal, cottonseed meal, linseed meal, distillers grains, corn gluten meal, and brewers grains. Other high protein feeds that can be included in cattle diets are fish meal and non-protein nitrogen. Non-protein nitrogen sources such as urea and biuret are very cheap feed ingredients and work well with corn rations to meet cattle protein requirements and are used quite extensively in large commercial cattle feeding operations. However, “natural” or plant protein sources (aka not non-protein nitrogen) are a better feeding option for show cattle because they tend to provide extra bloom. Additionally, feeding urea to cattle weighing less than 600 pounds is not advisable because they cannot use this source of protein to meet requirements.

Younger cattle require higher levels of protein than older heavier cattle, as illustrated in table 1. Additionally, for greater lean muscle gains, higher protein is required. All feed labels will provide a crude protein value of the feed. Crude protein is expressed as a percentage, so to determine if you are supplying enough protein to your animal you need to multiply the amount of feed by the percentage crude protein to determine how many pounds of crude protein you are providing your animal. If it matches the required amount in Table 1, your ration is sufficient. Here is an example of how to calculate the amount of protein fed from a complete feed that is 12% crude protein with the steer eating 15 pounds and the dry matter of the feed is 96%.

$$15 \text{ lbs feed} \times (96/100) \times (12/100) = 1.73 \text{ lbs of protein on a DM basis}$$

Roughages - Cattle are designed to be able to convert fiber from grass to a product that people can use – meat...therefore all cattle diets need to include a source of roughage (fiber). Common sources of roughages include cottonseed hulls, hays, peanut and rice hulls. In younger cattle, when starting on concentrate diets, a higher roughage feed needs to be included so that chances of acidosis and bloat are reduced. When feeding your cattle, you do not want to cause digestive upsets because in most instances, a steer or heifer who bloats early in life will continually bloat and have reduced performance.

Acidosis is when too much starch is offered to the rumen microbes and it causes them to produce an acid that can cause damage to the rumen and potentially founder. Bloat is when too much gas is produced in the rumen and cannot escape. This is easy to see on the animal because the left side of their body will be expanded. Acidosis is hard to diagnose visually, unless the animal is really sick. Often times it can be manifested as diarrhea and the animal going off-feed.

If bloat or acidosis occurs, then take the concentrate feed (corn or complete ration) out of the diet and place the animal on hay for a few days, then gradually start adding back the grain component. Properly stepping-up your steer or heifer to consuming concentrate will minimize the chance of acidosis and bloat. A typical method includes starting the steer or heifer with two to three pounds of grain with free choice hay for a couple of days, then increase the amount by 1-1.5 pounds a day for the next 10 to 15 days. At this point, they should be completely “on-feed” and this is what will be fed until you determine that a diet change is needed to meet your goals.

For a starting/growing ration, crude fiber needs 20-25% while a finishing ration needs to have about 12-16% fiber. Even in large commercial feeding operations there is at least 5% of the animal’s total diet that is a roughage/hay source. For younger animals a higher quality hay is recommended since such a large percentage of their diet is hay. Examples of high quality hay can include prairie, Bermuda, brome, and alfalfa. Alfalfa is the highest quality hay of that list, however, it is often not recommended to feed alfalfa to your show animals because it can very easily cause bloat. Dehydrated alfalfa pellets, on the other hand have a much lower chance of causing bloat issues and that is why they are often included in commercial mixes along with cottonseed hulls to meet the fiber requirements.

Additives – Special “ingredients” are not necessary to successfully feeding your show animal as long as requirements are met, however there are some feed additives that are useful to help with health, palatability, and conditioning of the feed and hair coat.

Medicated feeds are available if you have issues with coccidiosis or respiratory issues. Beginning January of 2017, if feeding medicated feeds to your cattle, you must work with a veterinarian to get a valid veterinary feed directive (VFD) to be able to feed certain products.

All cattle feeds should include an ionophore. Ionophores not only help with feed efficiency, but help with minimizing coccidiosis and bloat. There are several quality ionophores on the market and all work well for feed efficiency. Sometimes ionophores can cause a reduction in daily feed consumption, but the cattle performance should not be impacted. If intake is restricted enough adding some feed conditioners to help with palatability can help. Examples of feed conditioners that increase palatability and reduce dust issues include molasses, fat, and oil. Some fats and oils can also increase the shine to the hair coat of your show animal, as long as there is less than 4% fat in the total ration. If there is more than 4% fat then intake is reduced.

In instances when digestive upset occurs, sometimes products like yeasts, direct-fed microbials, buffers, and enzymes can be used, but overall, if cattle are well-fed and well-managed the need for these potentially expensive additives are not needed, especially on a daily basis.

Feeding Market Steer

Weight gain and fat thickness are the two primary points of concern with feeding your market steer. Knowing what your steer weighs at several times through the season will help you determine the diets that need to be offered. Based on your steer's weight, days, and final weight, you can determine the appropriate average daily gain to meet your objectives. You should have two sets of average daily gain goals; one for the steers growing ration and one for the finishing ration. Typically the finishing ration will be fed for 4-5 months prior to show. The equation below shows how to calculate the appropriate gains your animal needs. From there you can use Table 1 to determine the amount of energy and protein to meet that average daily gain goal.

Steer weighs 600 pounds at purchase 9 months from show date. The plan is to grow the steer to 850 pounds on the growing ration in 120 days. The average daily gain needs to be 2.08 lbs/d.

$$(850 \text{ lbs final weight} - 600 \text{ lbs beginning weight}) \div 120 \text{ days} = 2.08 \text{ lbs/d}$$

Finishing ration will start when steer weighs 850 pounds and you want show weight at 1300 lbs in 150 days. The average daily gain needs to be 3 lbs/d

$$(1300 \text{ lbs final weight} - 850 \text{ lbs beginning weight}) \div 150 \text{ days} = 3.00 \text{ lbs/d}$$

Feeding Replacement Heifer

Show heifers are not only used as a 4-H project, but they must be able to become a reproductive animal that can survive on a foraging system as a cow, once the show season is finished. As such, show heifers need to be in a good body condition for showing, but not so overly conditioned that their milk potential is severely reduced. Heifers that are too fat also have issues breeding, calving, milking, and then re-breeding as a first calf heifer. Heifer daily gains will be much lower than steer gains because a show heifer does not need to be mature at show time. Depending on age of heifer and show time, your heifer's targeted weights should correspond to when you plan on making the heifer a reproductive female. In general heifers need to weigh about 85% of their mature weight at 2-years of age, and if you are planning on breeding your heifer as a yearling, she needs to weigh ~60% of her mature weight. If you have a large framed continental heifer, her mature weight will probably be around 1400 pounds. Therefore as a 2-year old, you would like her to weigh ~1190 pounds and have a breeding weight at a year of age of ~840 pounds.

Once again you can do the calculations as described in the feeding market steer section to determine appropriate average daily gains for your heifers and use Table 2 to determine nutrient requirements to meet your objectives.

Example rations

The table below provides some example cattle rations to be fed as a supplement to hay (for example a heifer diet) or as a complete ration. Please read the footnotes prior to having a feed mill make any of these rations to aid in determining how to feed these rations. The amounts of feed to include are the batch-sheet which makes a ton of feed. Additionally, working with your extension professional or ruminant nutritionist can be a useful way to develop a ration to meet your animal's requirements, and before using any of these example diets, work with a nutritionist to determine best methods of feeding.

Feed Ingredient	<u>Starter/Grower (1)</u>		<u>Grower/Finisher (2)</u>		<u>Finisher (3)</u>	<u>Finisher (7)</u>
	Supplement (4)	Ration (5)	Supplement (6)	Ration (5)	Ration (5)	Ration (5)
Corn	1150	425	1350	845	1160	1275
Oats	400	200	250	200	200	--
SBM – 44%	300	320	250	265	220	--
Dried Distillers Grains	--	--	--	--	--	437
Cottonseed Hulls	--	920	--	560	290	100
Soy Hull pellet	--	--	--	--	--	72
Molasses	100	100	100	100	100	75
Limestone	20	20	30	20	20	20
TM Salt	20	10	20	10	10	20
Dicalcium phosphate	10	5	--	--	--	--
ADE (4 mil IU A/lb)	1.5	0.50	1	0.50	0.50	0.50
Ration Diet Composition (% as-is basis)						
Dry Matter	88.3	89.5	88.2	88.9	88.4	
Crude Protein	14.3	12.1	13.2	12.0	11.9	11.5
TDN	73.9	58.2	75.1	65.5	70.8	73.8
Calcium	0.60	0.58	0.68	0.50	0.49	0.49
Phosphorus	0.43	0.28	0.33	0.27	0.29	0.36
Fat	3.1	2.0	3.1	2.5	2.9	3.9
Crude Fiber	4.2	22.5	3.4	14.9	9.2	6.7

Rations 1-3 adapted from George V. Davis Jr. Beef Cattle Nutrition, Arkansas 4-H Beef Clinic. Ration 7 developed for example purposes within K-State system with estimated steer gains between 2.75 and 3.5 lbs/d.

- (1) For steers over 500 lbs expect 1.75 to 2.25 lbs average daily gain. For heifers over 500 lbs expect 1.25 to 1.75 lbs/d.
- (2) For steers expect 2.5 to 3.0 lbs/d gain. For heifers 1.75 to 2.25 lbs/d.
- (3) For steers expect 2.75 to 3.5 lbs/d gain. Excellent feeding management is needed with this ration.
- (4) Feed supplement at 1% of cattle body weight with good quality hay or pasture to be consumed at 1.5% of body weight.
- (5) Feed twice daily all cattle with consume in 30 to 45 minutes. Start feeding with hay and then gradually remove hay as adaption occurs, as described in roughages section.
- (6) Feed at 1.5% of body weight with good quality hay to be consumed at 1% of body weight.

Table 1. Nutrient Requirements of Growing Steer and Heifer Calves with finishing weight of 1,300 lb

Wt ^a (lbs)	Gain ^b (lb/d)	DMI ^c (lbs)	Diet Nutrient Density						Daily Nutrients per Animal			
			TDN (%DM)	NEm (Mcal/lb)	NEg (Mcal/lb)	CP (%DM)	Ca (%DM)	P (%DM)	TDN (lbs)	NEm (Mcal/d)	NEg (Mcal/d)	CP (lbs)
Pregnant yearling heifers - Last third of pregnancy												
715	0.76	18.5	50	0.45	0.20	7.3	0.22	0.13	9.3	5.89	1.13	1.35
	2.11	19.6	60	0.61	0.35	10.2	0.36	0.19	11.8	5.89	3.45	2.00
	3.21	19.1	70	0.76	0.48	13.0	0.49	0.24	13.4	5.89	5.47	2.48
845	0.76	18.5	50	0.45	0.20	6.9	0.21	0.13	10.5	6.67	1.28	1.45
	2.11	22.2	60	0.61	0.35	9.1	0.32	0.17	13.3	6.67	3.91	2.02
	3.21	21.7	70	0.76	0.48	11.4	0.42	0.22	15.2	6.67	6.20	2.47
975	2.11	24.7	60	0.61	0.35	8.3	0.28	0.16	14.8	7.43	4.35	2.05
	3.21	24.1	70	0.76	0.48	10.2	0.37	0.19	16.9	7.43	6.90	2.46
	3.99	22.8	80	0.90	0.61	11.9	0.44	0.23	18.2	7.43	8.76	2.71
Finishing weight is based on 28% percent body fat. This table is a small representation of nutrient requirements of beef cattle. Values are from the Beef Nutrient Requirement Council (NRC).												

Table 2. Nutrient Requirements of Breeding Heifers

			Diet Nutrient Density						Daily Nutrients per Animal			
Wt ^a	Gain ^b	DMI ^c	TDN	NEm	NEg	CP	Ca	P	TDN	NEm	CP	Vit. A ^d
(lbs)	(lb/d)	(lbs)	(%DM)	(Mcal/lb)	(Mcal/lb)	(%DM)	(%DM)	(%DM)	(lbs)	(Mcal/d)	(lbs)	(1000 IU)
Pregnant yearling heifers - Last third of pregnancy												
700	1.4	15.8	60.3	0.60	0.34	9.0	0.33	0.21	9.6	7.95	1.4	20
700	1.9	15.8	67.0	0.70	0.43	9.8	0.33	0.21	10.6	7.95	1.5	20
800	1.4	17.4	59.6	0.59	0.33	8.8	0.33	0.21	10.4	8.56	1.5	22
800	1.9	17.5	66.1	0.69	0.42	9.3	0.35	0.21	11.6	8.56	1.6	22
900	0.9	18.3	54.3	0.51	NA	8.1	0.26	0.20	9.9	9.15	1.5	23
900	1.4	19.0	59.1	0.58	0.32	8.5	0.30	0.21	11.3	9.15	1.6	24
900	1.9	19.2	65.4	0.68	0.41	9.0	0.32	0.21	12.5	9.15	1.7	24
Two-year-old heifers nursing calves - First 3-4 months post-partum - 10 lbs milk/day												
700	0.5	15.9	65.1	0.67	0.4	11.3	0.36	0.24	10.3	9.20 ^f	1.8 ^g	28
800	0.5	17.6	63.8	0.66	0.39	10.8	0.34	0.24	11.2	9.81 ^f	1.9 ^g	31
900	0.5	19.2	62.7	0.64	0.37	10.4	0.32	0.23	12.0	10.40 ^f	2.0 ^g	34
1000	0.5	20.8	61.9	0.62	0.36	10	0.31	0.23	12.9	10.98 ^f	2.1 ^g	37

^aAverage weight for a feeding period.^b Approximately 0.9 + 0.2 pound of weight gain/day over the last third of pregnancy is accounted for by the products of conception. Daily 2.15 Mcal of NEm and 0.1 pound of protein are provided for this requirement for a calf with a birth weight of 80 pounds.^c Dry matter consumption should vary depending on the energy concentration of the diet and environmental conditions. These intakes are based on the energy concentration shown in the table and assuming a thermoneutral environment without snow or mud conditions. If the energy concentrations of the diet to be fed exceeds the tabular value, limit feeding may be required.^d Vitamin A requirements per pound of diet are 1,273 IU for pregnant heifers and cows and 1,773 for lactating cows and breeding bulls.^e Not applicable.^f Includes 0.34 Mcal NEm/pound of milk produced.^g Includes 0.03 pound protein/pound of milk produced.

State Livestock Nomination Process

Lexie Hayes, Youth Livestock Program Coordinator
Department of Animal Sciences and Industry
Kansas State University

State Livestock Nomination Process

Lexie Hayes

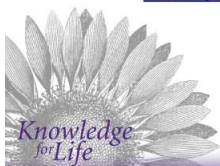
Youth Livestock Program Coordinator

March 2018



Nomination Process Overview

- Must nominate **market** or **commercial female** animals to be shown at a state show
 - ✓ Kansas State Fair (Grand Drive)
 - ✓ Kansas Junior Livestock Show (KJLS)
- 2018 Nomination Paperwork MUST be used
- 2018 Nomination Information and Forms available via:
 - ✓ Extension Offices
 - ✓ K-State Youth Livestock Program website
www.youthlivestock.ksu.edu ➡ Nomination Information



Postmark Deadlines

May 1, 2018

Market Beef

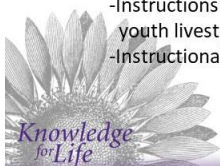
June 15, 2018

*Market Lambs, Commercial Ewes, ALL Meat
Goats, Market Swine, Commercial Gilts, and
Commercial Heifers*



Nomination Process

- Step 1:** Animals eligible for KJLS or KSF will need a Kansas 4-H EID ear tag placed in the ear of the animal **BY THE AGENT**
-Speak with your local Extension Office
- Step 2:** Exhibitors will fill out the declaration/nomination paperwork
-Print from www.youthlivestock.ksu.edu or request from Extension Agent
- Step 3:** Exhibitors will pull a DNA sample from the animal and place it in an official DNA envelope (DO NOT CUT THE HAIR)
-Envelopes may be obtained from local Extension Office
-Instructions on pulling DNA are in educational resource or on the youth livestock website
-Instructional videos on youth livestock website

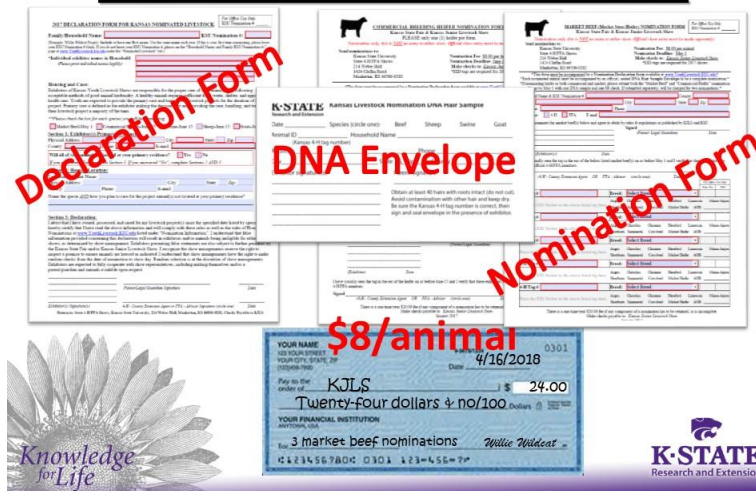


Nomination Process

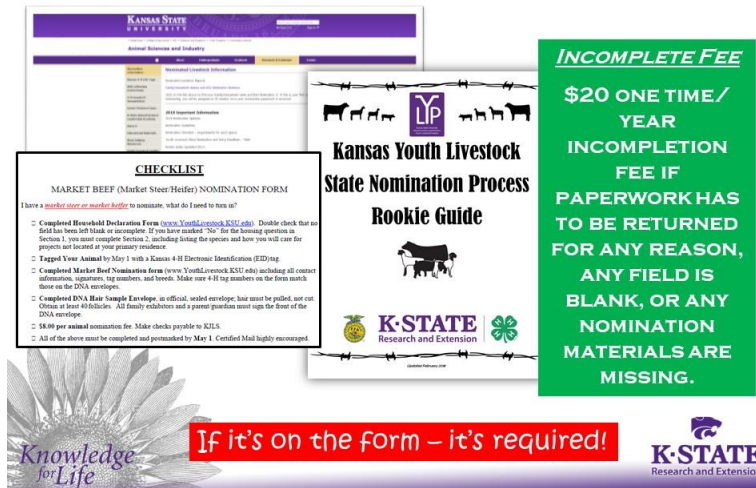
- Step 4:** Exhibitors will have their agent sign declaration/nomination paperwork & place barcode stickers on forms
- Step 5:** Exhibitors will mail their completed **declaration form, nomination form, DNA, and check** to be processed by KSU
-Certified mail is HIGHLY suggested (\$3.45-\$6.20 for peace of mind)
- Step 6:** KSU will process these nominations and post weekly updates online regarding complete/incomplete nominations. During this process there are also letters sent out to the families stating whether the nomination is complete/incomplete. This is the exhibitor/family's opportunity to verify the accuracy of the nomination information received by K-State.



Nomination Materials to Mail



Tips & Resources



2018 Nomination Process UPDATES

- Declaration Form – verbiage modification
- Specie Nomination Forms – verbiage modification
- Exhibitors are encouraged to write the breed and scrapie tag # or ear notch in the lower right corner of DNA envelopes
- **Tattoo no longer required for a commercial heifer**



Show Entry

- **REMINDER:** A livestock nomination is **NOT** an entry for Kansas Junior Livestock Show or Kansas State Fair.
- K-State processes and manages nominations, but KSF and KJLS manage their own shows and entry processes.
 - 3 SEPARATE processes
- Exhibitors must submit an entry for each of these shows once they have completed the nomination process
 - get entry information from Extension Office OR show website(s)



Kansas State Fair – Grand Drive



- Date: September 7-16, 2018
- Grand Drive: September 7-9, 2018
- Show held in Hutchinson, KS
- Entries Due: July 15th
- www.kansasstatefair.com



Kansas Junior Livestock Show

- Date: October 5-7, 2018
- Show held in Hutchinson, KS (State Fair Grounds)
- Entries Due: August 15th
- www.kjls.org



Thank You!

adhayes@ksu.edu
(785)532-1264

www.YouthLivestock.ksu.edu



Kansas State Youth Livestock Program



CATTLE HAIR SAMPLE COLLECTION INSTRUCTIONS



1 Check the ear tag number of the animal, and record it on the hair sample envelope.

We strongly recommend that you collect tail switch hair. If this is not an option, then collect hair from the poll, neck or tail head. Clean the sample

area with a paper towel to remove excess dirt if necessary.

Use bent, long or needle nose pliers to collect the sample.



2 Grasp hair close to skin with pliers and pull directly away from the skin. Take at least two pulls. Make sure that the sample has at least 30 hair roots. If tail switch is not available, then take at least 5 pulls from the poll, neck or tail head.



3 Inspect the hair sample to ensure at least 30 hair follicles.

Do NOT cut the hair from the animal. The hair **MUST** CONTAIN ROOTS for DNA testing. Avoid touching the roots and make sure the hair is dry.

Place hairs in the sample envelope and seal the envelope. Do not put hairs in a plastic bag.



4 Fill out the remaining information lines on the envelope, and have the witnesses sign.

REMEMBER: Cleanse hands and pliers between animal samples to ensure that hairs from different animals are not mixed.



CATTLE HAIR SAMPLE CHECKLIST

- ✓ Insert ear tag number on the envelope
- ✓ Collect hair from tail switch
- ✓ Obtain at least 30 hairs with follicles
- ✓ Take at least 2 pulls
- ✓ Inspect for follicles—do NOT touch follicles
- ✓ Obtain exhibitor signature & seal envelope
- ✓ Clean pliers and hands between animals

2018 Kansas State Youth Livestock

Nomination Guidelines

In order to show at the Kansas State Fair (KSF) or Kansas Junior Livestock Show (KJLS), you must first nominate your animal.

What is a nomination? A nomination is documentation that you have owned, possessed and cared for your animal since a certain date in order to show at a state show.

How are the nomination dates set? The nomination dates are set by minimal guidelines set forth by Kansas 4-H on how long you should own, possess and care for your animal to have gained the optimal experience. In addition, the KSF and KJLS Board of Directors agree on these dates.

What are the nomination dates?

May 1 Market Steers and Market Heifers

June 15 Commercial Heifers, Market Lambs, Commercial Ewes, Market Hogs, Commercial Gilts, and ALL Meat Goats (Market Goats, Commercial Does, and Registered Does)

How do I know what to turn in? The Youth Livestock Program has compiled a list of requirements (checklist) for each species.

How much does it cost? The nomination fee is \$8.00 per animal, for all species.

What is the Declaration form? The declaration form is required by all families/households who nominate animals and wish to show at Kansas State Shows (Kansas State Fair Grand Drive or KJLS). This form states the family/household name, along with who is able to show within that family/household. In addition, it lists the physical location of where the animals are kept, and also has a statement about possession, ownership and care of the animals. It must be signed by all individual exhibitors, a parent/guardian, and extension agent/advisor. Each family/household must complete a declaration form annually, which includes all eligible exhibitors for that year.

Is a Nomination the same as an entry for the show? **NO!** You must first nominate your animal in order to declare that you own, possess and care for them. Then, you must actually enter that animal for the show following the specific entry processes set forth by the Kansas State Fair (KSF) and Kansas Junior Livestock Show (KJLS). You must do both of these things in order to show.

Nominations are sent to the KSU Youth Livestock Program office, but the entries for KSF and KJLS are sent directly to and managed by the respective Livestock Show offices.

How will I know if my Nomination is complete? Once your nomination is put into the nomination database, you will receive a letter in the mail from the KSU Youth Livestock Program. This letter will list all of the animals that we have in the system from you. A family/household will receive a separate letter for each species nominated. If you are missing information, it will tell you what you are missing and how to fix that issue. In addition, we post the nomination information on our website www.YouthLivestock.KSU.edu under Nominated Livestock so you can see if your nomination is complete. We update this often during the nomination season and highly recommend that you use this tool.

What if I don't get everything in the first time? If your confirmation letter states that something is missing or wrong, there is a one-time fee of \$20.00. This includes declaration or nomination form, DNA Envelope, and signatures (exhibitor, parent and agent/advisor). The \$20.00 incomplete fee must be submitted with the missing or corrected information for the nomination to be complete.

Where do I get ear tags and DNA envelopes? Animals must be tagged and DNA Hair Sample envelopes obtained through your local Extension Office. Make sure you communicate with your local Extension Office far enough in advance for them to have enough tags and official envelopes available for the number of animals you plan to nominate. DNA must be submitted in an official DNA envelope. One type of envelope is available for all species. Please refer to the Step-by-Step page in the "Rookie Guide" for detailed information on obtaining DNA samples from your animals.



Youth Livestock Program · Kansas State University
214 Weber Hall · Manhattan, KS 66506 · 785-532-1264

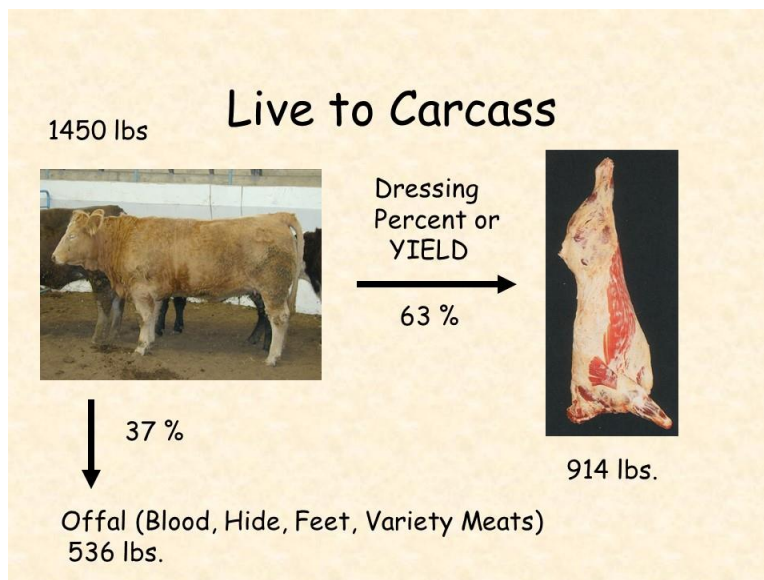


Where's the Beef?

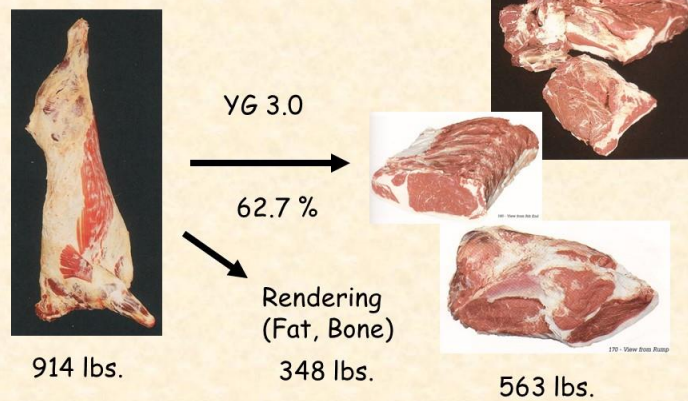
Dr. Terry Houser, Associate Professor, State Extension Meat Specialist
Department of Animal Sciences and Industry
Kansas State University

Where's The Beef?

Terry Houser Ph.D.
Extension Meat Specialist

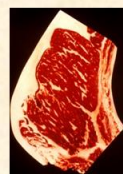


Carcass to Subprimals



Beef Grading

Quality Grade

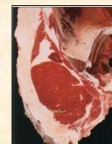
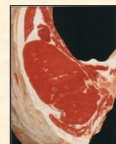


- Prime
- Choice
- Select
- Standard
- Commercial
- Utility
- Cutter
- Canner



Yield Grade

- YG 1
- YG 2
- YG 3
- YG 4
- YG 5



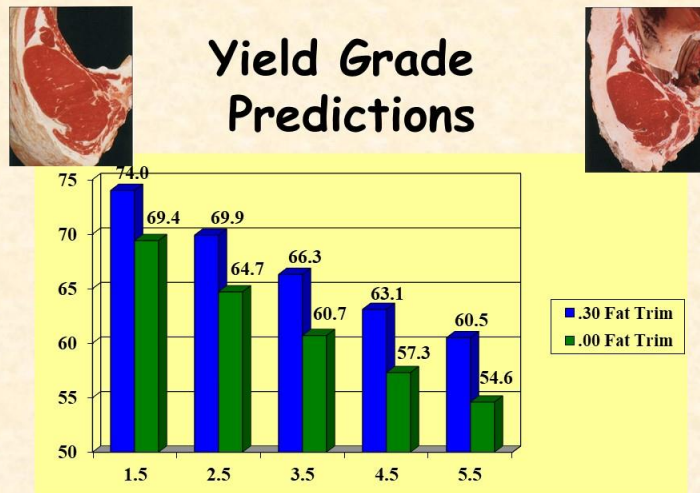
Carcass Prices

- Prime : \$215.11/cwt
- CAB-Ch Ave and High: \$205.45/cwt
- Choice, Low: \$200.11/cwt
- Select: \$193.90/cwt
- Standard (No Roll): \$174.95/cwt
- Yield Grade 1's : + \$3.50/cwt
- Yield Grade 4's : - \$11.15/cwt

USDA carcass price equivalent index 3-9-2018

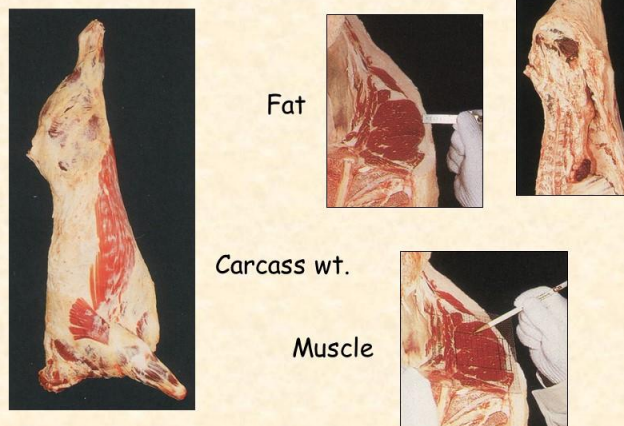
**Yield Grade Predicts the Percentage of
Carcass Weight in Boneless, Closely
Trimmed, Retail Cuts From the Round,
Loin, Rib, and Chuck**

Yield Grade	Retail Cut Yield, %
1.0	54.6
2.0	52.3
3.0	50.0
4.0	47.7
5.0	45.4

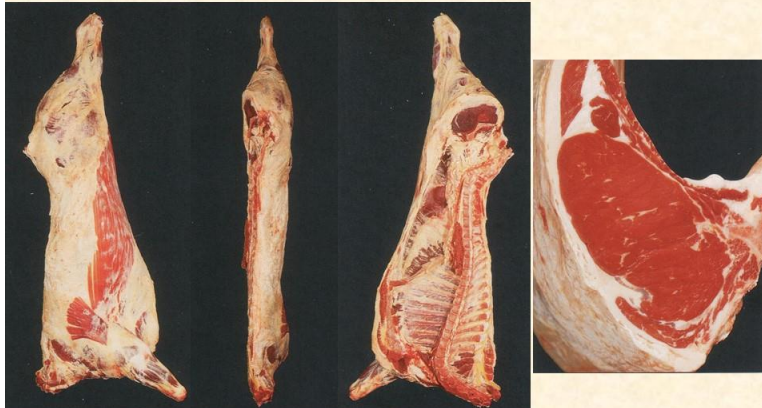


Predicted boneless, closely trimmed retail cuts with lean trim = 20% fat, Dikeman et. al. (1998)

Beef Yield Grade



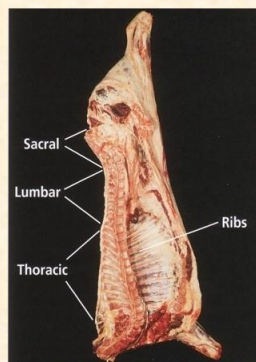
Yield Grade 1.5



Yield Grade 4.5

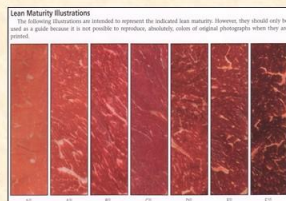
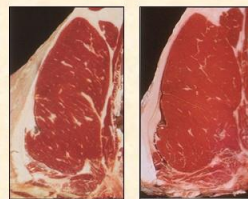


Beef Quality Grade



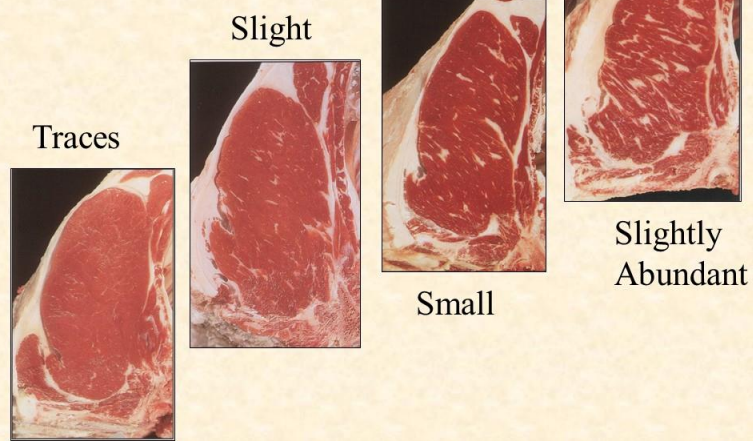
Maturity (Bone and Lean)

Marbling



Lean color

Marbling



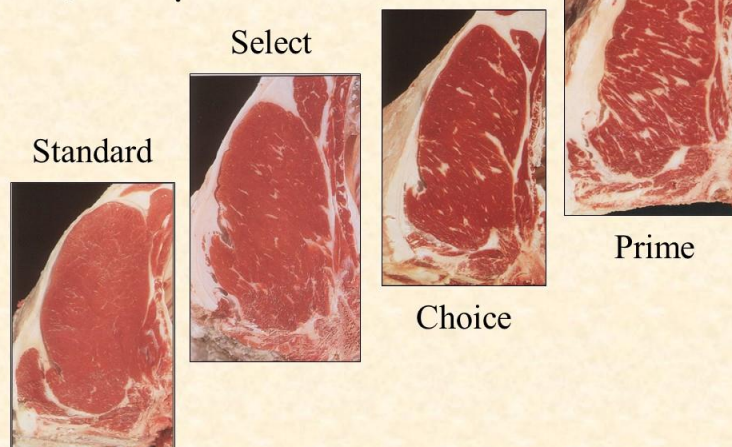
RELATIONSHIP BETWEEN MARBLING, MATURITY, AND CARCASS QUALITY GRADE ¹					
DEGREES OF MARBLING	MATURITY ²				
	A ³	B	C	D	E
Abundant	PRIME				
Moderately Abundant					
Slightly Abundant				COMMERCIAL	
Moderate					
Modest	CHOICE			UTILITY	
Small					
Slight	SELECT				
Traces					
Practically Devoid	STANDARD			CUTTER	

¹Assumes that firmness of lean is completely developed with the degree of marbling and that the carcass is not a "dark cutter."

²Maturity increases from the left to right (A through E).

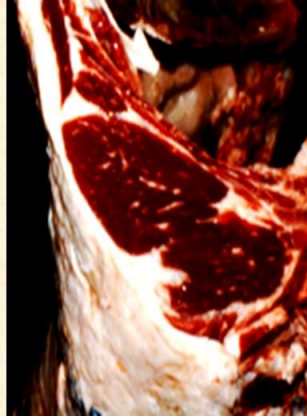
³The A maturity portion of the figure is the only portion applicable to bullock carcasses.

Quality Grade

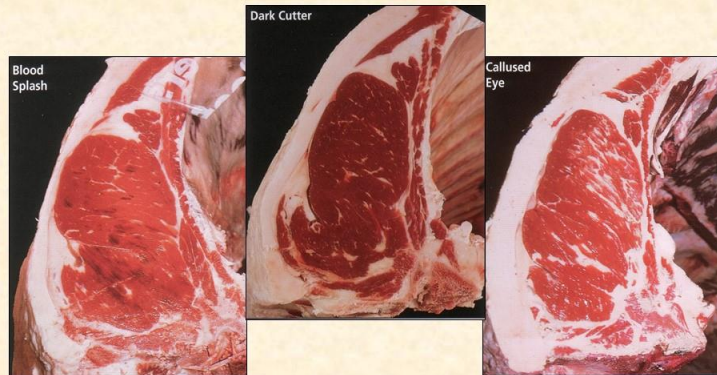


Dark cutter

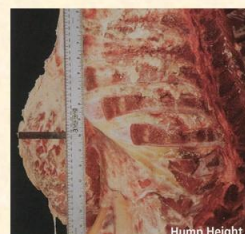
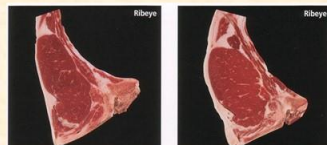
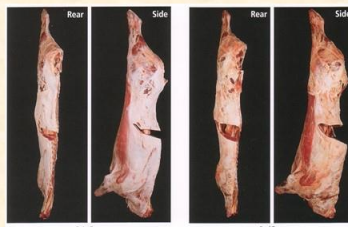
Can be discounted
up to 1 full
quality grade
depending on
the degree of
darkness



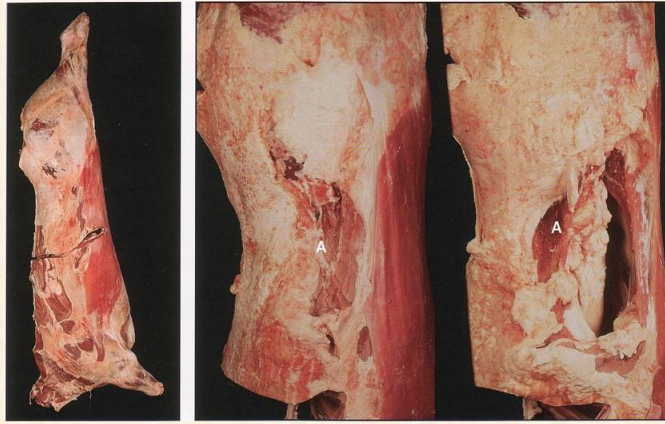
Non-conformity Discounts



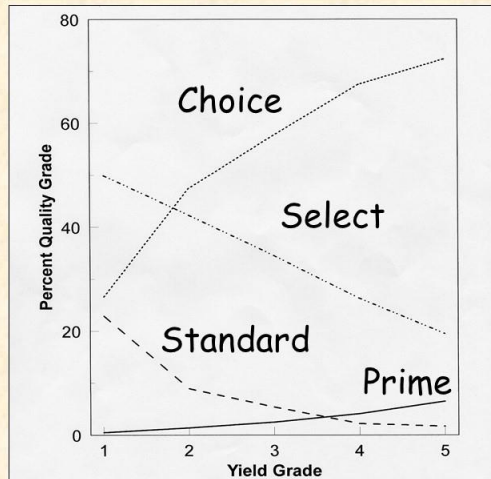
Non-conformity Discounts



Bruises



Relationship of Quality and Yield Grades



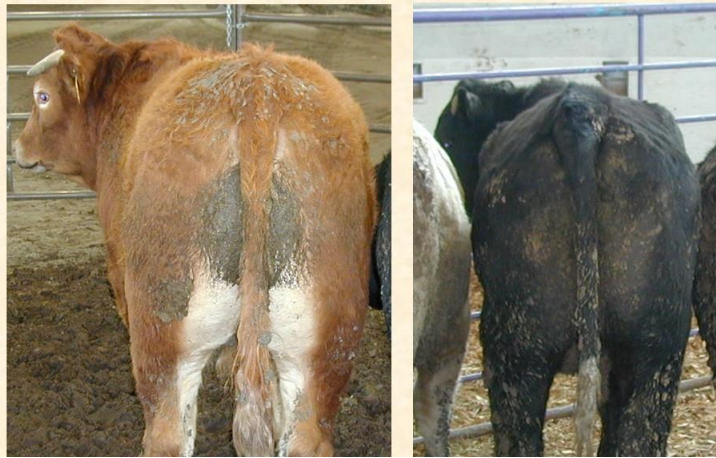
Muscling



Fat Thickness 0.32 vs. 0.32

Ribeye Area 18.5 vs. 11.2

Muscling



Muscling



Muscling



Fatness



Fat Thickness 0.36 vs. 1.08

Ribeye Area 15.1 vs. 14.7

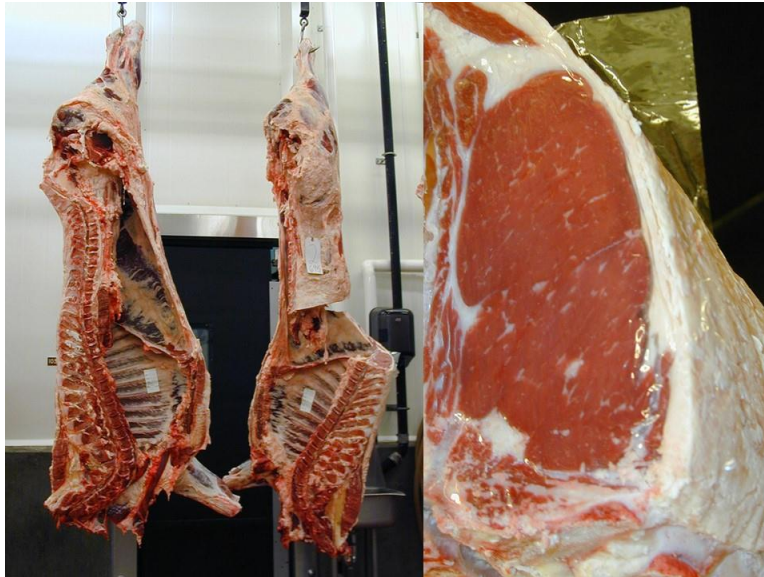
Fatness



Fatness







HCW	695
Dressing %	62.3
FT	0.28
REA	14.8
KPH	2.0
Yield Gr.	1.6
Quality Gr.	Se+

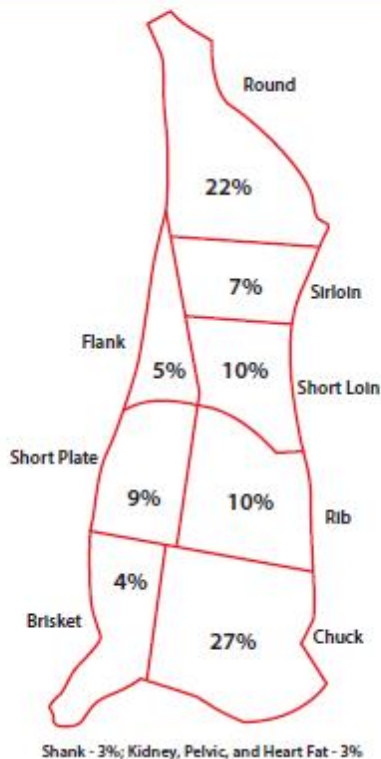




HCW	710	
Dressing %	62.0	
FT	0.52	
REA	12.8	
KPH	2.0	
Yield Gr.	2.9	
Quality Gr.	Ch ^o	



Beef Processing Options for Consumers



The primal cuts of beef as a percentage of carcass weight.

This guide explains choices available to consumers when they take a beef animal to be processed. It provides information on the approximate amount of meat that should be returned from each primal after the animal has been prepared to customer specifications.

Chuck: The chuck is commonly cut into bone-in or boneless roasts of specified thickness or weight. Alternatively, the chuck can be cut into bone-in steaks and some boneless steaks. Ranch steaks, flat iron steaks, and petite tender steaks are boneless

steaks commonly produced from the chuck. Some of the chuck also can be used for stew meat or ground beef.

Rib: Normally, the rib is cut into either bone-in ribeye steaks or boneless ribeye steaks and back ribs. Consumers may prefer the rib to be cut into either boneless or bone-in roasts for cooking of prime rib.

Short loin: Two options for cuts from the short loin are T-bones and porterhouse steaks or boneless New York strip steaks and tenderloin steaks (filets). T-bones and porterhouses are larger cuts. The boneless options are typically selected by consumers who desire smaller portion sizes.

Sirloin: The sirloin can be cut into either boneless or bone-in steaks. Because of the large size of bone-in sirloin steaks, customers may prefer smaller boneless alternatives. Additionally, the coulotte roast (sirloin cap) can be cut from the sirloin or cut as part of the sirloin steaks. The tri-tip is typically cut as a roast from the sirloin as well.

Round: Cut options from the round include tip roasts, rump roasts, heel roast, and top, bottom, and eye-of-round roasts of a specified size and weight. The round can also be cut into steaks, with many customers choosing to have some of these steaks tenderized (for chicken fried steak) or to have this product produced into ground beef.

Ground beef: Consumers can specify leanness of ground beef, commonly 90%, 80%, or 70% lean, but can expect fewer pounds of ground beef with increased lean points.

Miscellaneous: Each carcass half has one brisket and flank steak as well as two skirt steaks. Briskets can either be whole or cut into two halves (flat half and point half). The plate can be returned as short ribs or used for ground beef. Organs (heart, liver, kidneys, oxtail, and tongue) are optional.

Beef Cutout Tables

The numbers below are based on an 800-pound, Low Choice, Yield Grade 3 carcass and represent the industry average. A 3% shrink (cooler shrink and cutting loss) is assumed. The table shows boneless and bone-in options and the approximate weight and percentage of the hot (unchilled) carcass represented by each.

Boneless Option	% of Hot Carcass	Weight (lbs)
Chuck		
Chuck eye roasts or steaks	4.1	32.8
Mock tender roasts or steaks	0.8	6.2
Flat iron steaks	1.3	10.3
Shoulder petite tender steaks	0.3	2.1
Ranch steaks or boneless arm roasts	1.5	12.3
Denver steaks	0.8	6.2
Boneless short ribs	0.3	2.1
Ground beef / stew meat	12.8	102.6
Fat and bone	3.8	30.8
Rib		
Ribeye steaks or boneless rib roasts	3.5	28.1
Back ribs	1.0	7.9
Ground beef or stew meat	3.2	25.8
Fat and bone	1.8	14.4
Loin		
Strip loin steaks	3.1	24.5
Tenderloin steaks or roasts	1.5	11.6
Top sirloin steaks (cap-off)	2.1	16.8
Coulotte (sirloin cap)	0.5	3.9
Tri tip roast	1.1	9.0
Ground beef	4.2	33.6
Fat and bone	3.7	29.7
Round		
Top round steaks and roasts	5.6	45.1
Bottom round steaks and roasts	3.7	29.4
Eye of round steaks and roasts	1.3	10.8
Tip steaks and roasts	2.9	23.4
Ground beef / stew meat / kabob meat	2.9	23.3
Fat and bone	4.4	35.1
Miscellaneous		
Brisket	3.2	25.8
Flank steak	0.5	3.8
Short ribs	6.3	50.2
Skirt steaks	1.1	9.1
Kidney, pelvic, and heart fat	2.0	16.0
Ground beef	5.4	43.1
Fat and bone	6.3	50.2
Total steaks and roasts	46.4	371.4
Total ground beef / stew meat	28.6	228.5
Total fat and bone	22.0	176.2

Bone-In Option	% of Hot Carcass	Weight (lbs)
Chuck		
Blade roasts and steaks	10.2	81.8
Bone-in arm roasts and steaks	7.6	60.9
Ground beef / stew meat	5.0	39.9
Fat and bone	2.8	22.7
Rib		
Bone-in ribeye steaks or roasts	4.5	35.7
Ground beef / stew meat	3.2	25.8
Fat and bone	1.8	14.4
Loin		
T-bones and porterhouses	4.5	36.2
Bone-in sirloin steaks	3.1	24.5
Tri tip roast	1.1	9.0
Ground beef	4.2	33.6
Fat and bone	3.2	25.8
Round		
Top round steaks and roasts	5.6	45.1
Bottom round steaks and roasts	3.7	29.4
Eye of round steaks and roasts	1.3	10.8
Tip steaks and roasts	2.9	23.4
Ground beef / stew meat / kabob meat	2.9	23.3
Fat and bone	4.4	35.1
Miscellaneous		
Brisket	3.2	25.8
Flank steak	0.5	3.8
Short ribs	6.3	50.2
Skirt steaks	1.1	9.1
Kidney, pelvic, and heart fat	2.0	16.0
Ground beef	5.4	43.1
Fat and bone	6.3	50.2
Total steaks and roasts	55.7	445.9
Total ground beef / stew meat	20.7	165.7
Total fat and bone	20.5	164.2

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How Much Meat To Expect From Your Animal

Have you ever taken your steer to the butcher at 1,300 pounds and been confused when you were only returned 500 pounds of cut and packaged beef? Like many consumers, you may be unaware of the steps in animal processing that result in changes in product weight. Some changes occur in converting the live animal to a carcass, and more before the animal becomes packaged meat. This guide explains the process and provides tools to help you determine the amount of meat to expect when you have an animal harvested.

- Hide or wool weight
- Horns
- Animal muscling and fatness

From live animal to carcass in the cooler

The first step is to convert the live animal to a carcass. The amount of the live animal's weight represented by the carcass, or *dressing percentage*, can be calculated as follows:

$$\text{Dressing percentage} = (\text{carcass weight} \div \text{live weight}) \times 100$$

Next, the animal's blood, hide, and internal organs are removed, which results in weight loss. The amount of weight lost is highly variable and can be affected by many characteristics, including:

- Mud or manure on the animal's hide
- The amount of food in the animal's stomach (gut fill)
- Bruises that must be trimmed from the carcass



Species differences

The dressing percentage is different for each species as animals carry body weight differently. Pork has the highest dressing percentage (70-75%) because the skin and feet remain on the carcass, and hogs are monogastrics with single-compartment stomachs. Lambs have the lowest dressing percentage (54-59%) due to heavy hides and less muscling on the carcass. The beef dressing percentage (60-64%) falls between pork and lamb.

Average dressing percentage
for the three major meat species

Species	Average dressing percentage (%)
Beef	60-64
Pork	70-75
Sheep	54-59

From whole carcass to retail cuts

Estimating the carcass weight of an animal is fairly easy because the process is standard across the industry. Predicting the weight returned as cuts of meat is much more difficult. A carcass can be processed into cuts (steaks, roasts, and ground meat) in multiple ways. The final weight varies depending on the processing style and cuts requested. Customers have many options and may be able to customize their order, adding even more variability to the equation. Here are a few choices that can affect the weight of the finished product:

- **Bone-in vs. boneless cuts:** Removing the bone results in less weight returned as product.
- **Fat percentage in the ground product:** A leaner product produces fewer pounds of ground meat.
- **Aging:** Longer aging periods improve meat tenderness but lead to moisture loss and less weight returned.
- **Type of aging (dry-aged vs. wet-aged):** Dry-aged products result in more moisture loss due to dehydration and additional trimming losses due to surface crust removal.
- **Further processing:** Having cuts processed into cooked sausages, hams, bacon, corned beef, and similar products results in fewer pounds of returned product because of the moisture lost during the cooking process.

The amount of meat returned after harvesting an animal varies. The following examples should help consumers understand where the weight of the live animal goes and provide information on the approximate amount of meat to expect. Other fact sheets in this series describe processing options for individual species.

Example for cattle:

Live weight = 1,290 lbs.
Actual dressing %: 62%
Carcass weight = 800 lbs.
Bone-in option: 65-70% of carcass weight
Boneless option: 55- 60% of carcass weight
Approximate bone-in meat returned = 520 lbs.
OR approximate boneless meat returned = 440 lbs.

Example for hogs:

Live weight = 285 lbs.
Actual dressing %: 72%
Carcass weight = 205 lbs.
Bone-in option: 75-80% of carcass weight
Boneless option: 65-70% of carcass weight
Approximate bone-in meat returned: 154 lbs.
OR Approximate boneless meat returned = 133 lbs.

Example for sheep:

Live weight = 132 lbs.
Actual dressing %: 55%
Carcass weight = 70 lbs.
Bone-in option: 70-75% of carcass weight
Approximate bone-in meat returned = 50 lbs.

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Cattle Behavior & Handling

Jared Mumm, Graduate Student
Department of Animal Sciences and Industry
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CATTLE BEHAVIOR AND HANDLING

UNDERSTANDING YOUR LIVESTOCK AND WORKING WITH, NOT
AGAINST THEM

Jared Mumm
Kansas Junior Beef Producer Day 2018



- **Physiology**
 - How they are built to react
- **Behavior**
 - How they react
- **Handling techniques**
 - How to make them do what we want

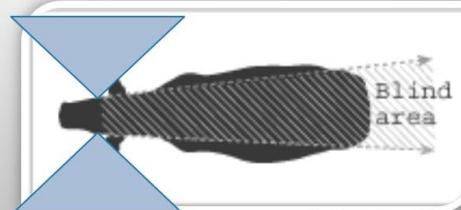
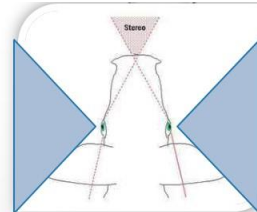
CATTLE PHYSIOLOGY

- Cattle have always been prey animals
- Evolutionary adaptations have driven behavior



CATTLE PHYSIOLOGY

- **320°** visual field: monocular dominant
 - 1/12th the visual **depth perception** of humans
- Cones most sensitive to yellowish-green and blue-purple light: color vision
- Sensitive to **motion** and light/dark contrasts
- Cattle do not focus as quickly on nearby objects
 - close objects can “surprise” them



CATTLE PHYSIOLOGY

- Range 8,000-21,000 Hz
- Difficulty localizing sound
 - Wide field of vision may not require acute localization of sound compared to animals with narrower-field vision
- Yelling, high pitched noise, intermittent sound increases heart-rate (stressor)
 - Rapid motion has a greater affect on fear response
- Cattle are more sensitive to odors and pheromones



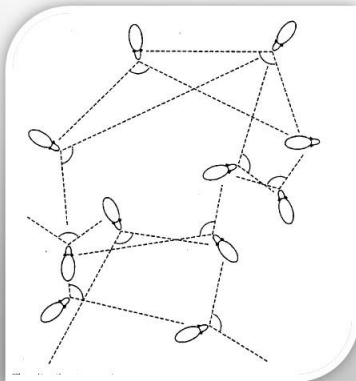
CATTLE PHYSIOLOGY

- The hippocampus (learning and memory) in cattle is excellent
 - For example, if a cow perceives the new experience as a “reward” or a “punishment,” they will never forget!

NEW IS SCARY!!!!!!!!!!



CATTLE BEHAVIOR



Always on the look-out for subtle signals

- Posture and body-language
 - Startle-response of herd mates
 - Head position
- These serve as “quiet” signals
- Allows for multi-tasking
- They can “spread-out” while grazing, ruminating, or resting

CATTLE BEHAVIOR



- As soon as one gives a signal, they bunch together and **mill**, in a circular motion
- This is a natural reaction to predators
 - Most dominant end up in the center
 - They will do this during handling if just one group-mate is fearful

CATTLE BEHAVIOR

Flight Zones – The point at which he can no longer tolerate the approach of another person or animal, and moves away. –Grandin, 2008



CATTLE BEHAVIOR

Animals will influence each other's flight zone



CATTLE BEHAVIOR

Social isolation increases flight zone



Beware the lone animal!!!

CATTLE HANDLING



Know the animal's experience prior to handling

CATTLE HANDLING

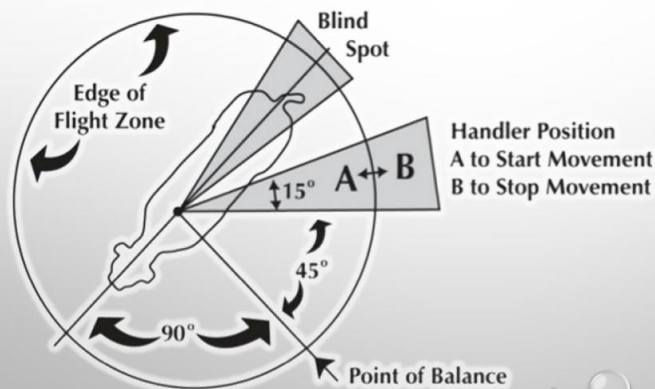


Figure 1. Flight zone
Taken from "The Cattle Industry's Guidelines for the Care and Handling of Cattle", National Cattlemen's Beef Association

- Pressure and flight zones change based on temperament and training
- Stay calm cool and collected
- Moving slowly and methodically is better

CATTLE HANDLING



Give them a place to go!

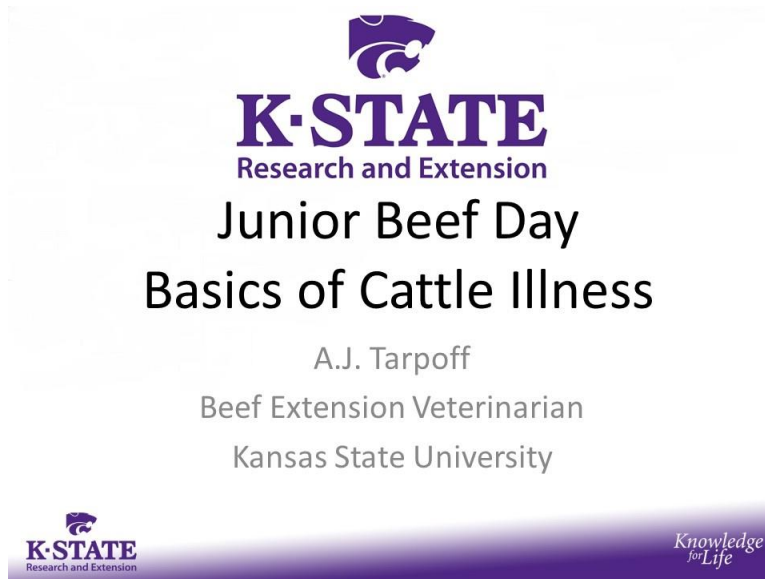
CATTLE HANDLING

- HANDLERS MAY USE
 - HAND
 - PADDLE/LIGHT POLL
 - PROD (ONLY AT THE CHUTE)
 - NUDGE FROM AN ANIMAL-PARTNER (HORSE, DOG)



Basics of Cattle Illness

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Department of Animal Sciences and Industry
Kansas State University



Cattle are a prey species!

- Very good at hiding illnesses
- So we need to be very observant!
 - Changes in behavior
 - Changes in eating
 - Changes in mobility
 - Changes in appearance



Basic Biosecurity

- Prevent introduction and transfer of disease
- Work with your veterinarian to ensure preventative measure are in place
 - Vaccine Program
 - Maintain a Health Record of any and all products administered to your animals
- Monitor animals daily for any signs of illness

Basic Biosecurity

- Avoid contact with animals other than your own
 - We can transmit pathogens
- Do not share feed/water tubs, grooming supplies, or other tack or equipment

Skin Conditions

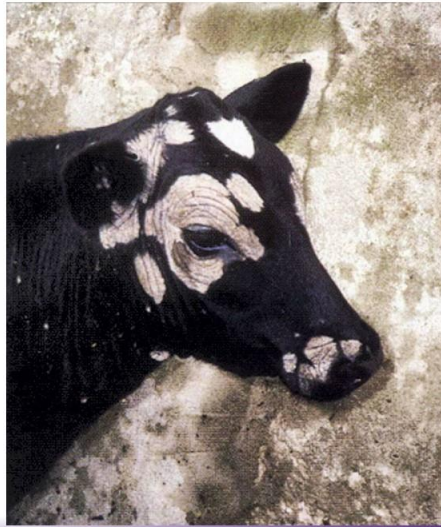
Warts

- Crusty lesions on face/neck
- Caused by a virus
 - Infectious
- Most shows don't allow animals with warts
- Cattle resolve wart issues as they age



Ringworm

- Circular areas of hair loss
- Caused by a fungus
 - Very infectious
- Shows don't allow animals with Ringworm
- Will resolve in 2-4 months on its own
- People can get it!



Pinkeye



Pinkeye

- Caused by a bacteria
- Painful!
 - Blinking
 - Tearing
- Can lead to an ulcer
- Work with veterinarian
 - Abx plus eye patch to protect eye

Lameness

- Footrot
 - Swollen foot (between toes)
- Joint infection
- Laminitis



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*Knowledge
for Life*

Lameness

- Footrot is caused by a bacteria
 - Responds well to abx treatment
 - Work with your veterinarian
 - If non-responsive, further workup is warranted
- Joint infections
 - Longer term treatment plan
- Laminitis or Founder
 - Over eating grain
 - Difficult to manage once signs have set in

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Research and Extension

*Knowledge
for Life*

Bloat

- Can be an emergency!!



Bloat

- Contact an experienced person or veterinarian immediately
- Air must be released via stomach tube
- May have been caused by
 - Over-eating grain
 - Secondary to pneumonia

Respiratory Disease

- Prevention is key
- Set up a vaccination program with your veterinarian
- Early treatment is critical
 - Work with your local veterinarian on a treatment regimen
 - Record all antibiotic usage and follow withdrawal periods

Respiratory Disease

- Depressed
- Off feed or eating less
- Breathing rate increased
- Fever
- Dirty or runny nose



Urinary Stones

- Possible with high grain rations
- Steers
- Constant straining
- Discomfort
- Posturing to urinate
- Contact vet immediately!!



Coccidiosis

- Specks of blood in diarrhea
- Constant straining
 - Tailhead raised
- Treatment!
 - Work with you veterinarian
 - Many options



Conclusions

- Create a good relationship with you local veterinarian
- Be observant!



*Knowledge
for Life*

BIOSECURITY

Keeping your cattle healthy

Biosecurity is another way of saying “infectious disease control.” Biosecurity is a combination of management practices designed to prevent the introduction and transmission of diseases into and throughout a herd. Infectious diseases can be transmitted by animals, people, equipment and vehicles. Livestock exhibitions are events where animals have an increased risk of getting infectious diseases due to the commingling of animals from different sources. Taking some simple precautions can help reduce that risk and keep your animals healthy. Below are some biosecurity recommendations for ensuring the health of your show cattle.



Before the Show

- Read all guidelines for each show to be sure your animals meet all entry and exhibition requirements.
- Work with your veterinarian to ensure your cattle are up to date on vaccinations.
- Evaluate your cattle’s health prior to going to the show. Never take an unhealthy animal to a show. Signs of illness can include decreased appetite, fever, diarrhea, nasal discharge, coughing and blisters around the mouth, nose and/or hooves. If you see any of these signs, please contact your veterinarian.
- Take only clean and disinfected equipment to the show to prevent any potential disease transfer from your cattle to others.

During the Show

- Monitor your cattle daily for signs of illness. If you suspect your animal is sick, notify a show official right away.
- Avoid personal contact with animals other than your own.
- Do not share feed, feed/water tubs, grooming supplies or other equipment with other exhibitors at the show.
- Keep your area and equipment clean of manure contamination.
- Wash your hands frequently with warm soapy water after contact with animals or equipment.

After the Show

- Isolate the cattle you took to the show from the rest of your herd when you return home.
- The show cattle should be as far from the other animals as possible, but they need to be at least far enough away to prevent nose-to-nose contact. Your veterinarian can help you establish a good location.
- Modify your chore routine to care for your show cattle last each day. Do not share equipment between show cattle and any other animals at home.
- Monitor your show cattle daily for signs of illness, including those signs listed in the “Before the Show” section. Contact your veterinarian if any animal shows signs of illness.
- Clean and disinfect all equipment, shoes, vehicles and trailers you took to the show. Allow them to dry completely.
- Talk to your veterinarian to determine the best biosecurity practices for your cattle.

Reproduction in Beef Cattle

Dr. David Grieger, Professor, Beef Cattle Reproduction
Department of Animal Sciences and Industry
Kansas State University

Junior Beef Day at Kansas State

March 24, 2018

Reproduction in Beef Cattle

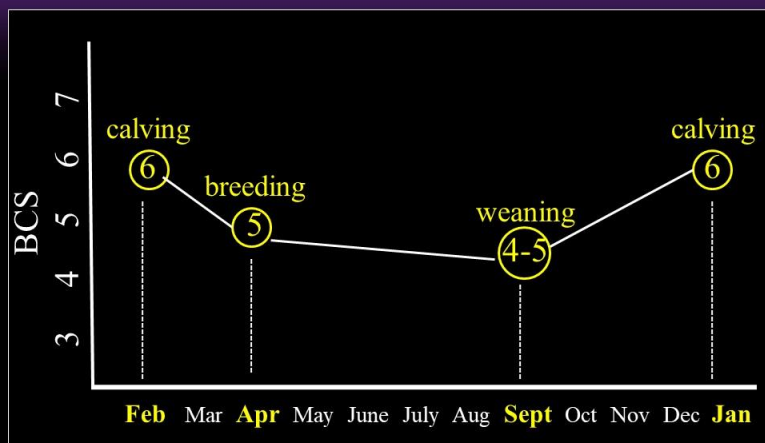


Reproduction in Beef Cattle

- Why is reproductive management important?
- Feeding
- Breeding
- Will she calve?
- When will she calve?

Pregnancy Determination

- A. Palpation
- B. Ultrasonography
- C. Blood test



Body Condition of the Cow



Stages of gestation (aging the pregnancy)

~150-160 days

~130-140 days

~110-120 days

~90-100 days

~60 days



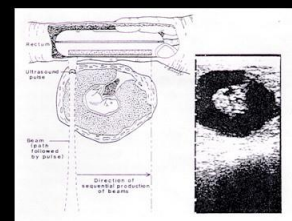
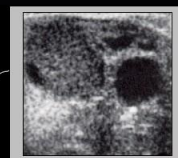
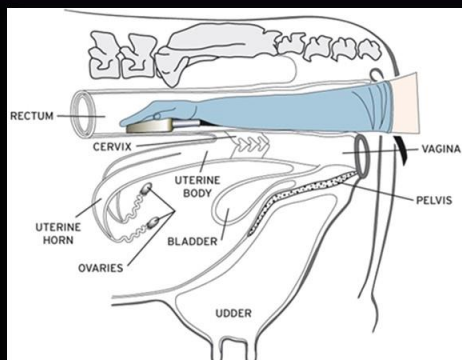
Estrous Cycle of the Cow

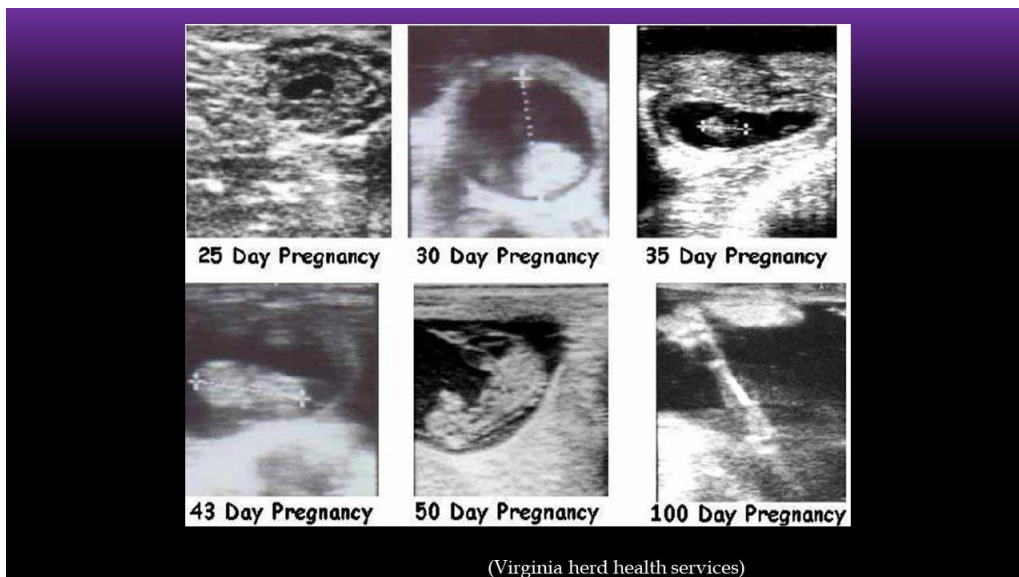
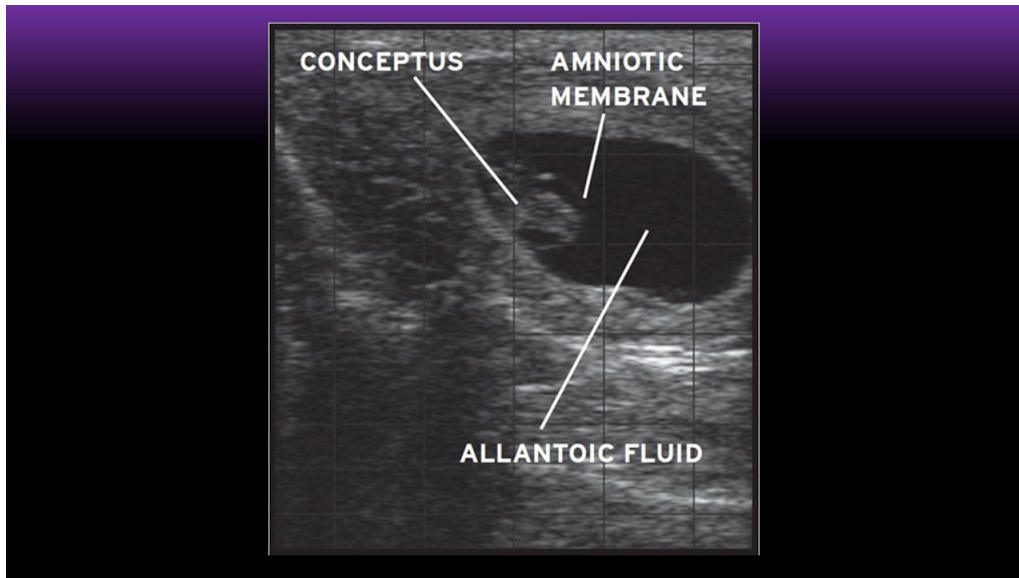
How many observable signs are there to confirm that a cow or heifer is in heat?

ONE: standing firm when mounted

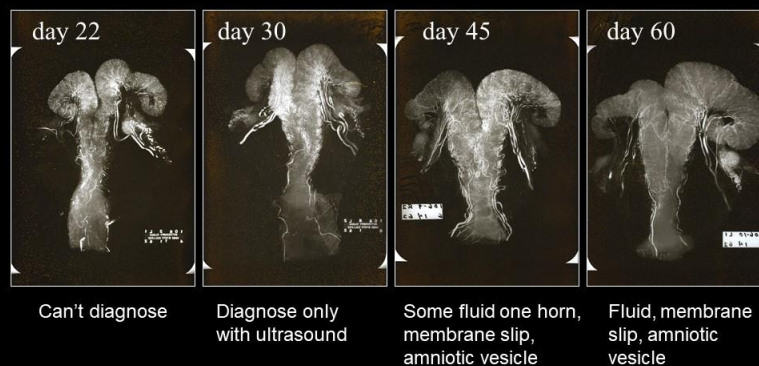


Ultrasound application to cattle reproduction





Stages of gestation (aging the pregnancy)



Beef Cattle Showmanship

Beef cattle, like other species require handling and training that starts at home. In order for you to have an animal that works properly in the show ring, you must put in many hours of hard work in order to maximize your animal's strong points and minimize the weaker points. Halter breaking, feeding, washing, clipping, and practicing showing are all things that should be completed at home, prior to going to any show.

A good showman is clean and well presented, aware of the judge and your surroundings, courteous at all times, pays attention, and knows how to properly set up your animal to show it's best physical attributes.

Showman's Attire

A showman should be neat and clean just as your animal should be well groomed. It is recommended that you wear appropriate clothing consisting of a tucked-in collared shirt, leather boots, jeans and a belt. Fancy and flashy clothing are not needed to look professional and can cause a distraction. A baseball cap has no place in the show ring.

In addition to being properly dressed, you should have the necessary equipment. A comb in your back pocket with the teeth turned to the inside as well as a show stick and show halter are necessary.

Show Time

- Check the show schedule and be ready when your class is called
- Lead the calf from the left side
- Your show stick should be in your left hand
- Don't coil the lead strap up around your hand or let drag
- Be aware of the judge and ring stewards
- Use the entire space provided
- Do not crowd other livestock

Setting Up Your Animal:

Always allow space between your calf and the calf next to you. Generally, you will set your animal up in a rear profile position after you walk into the ring. In order to set up in rear profile correctly, all feet should be set at all four corners under the animal. You will then lead your animal around the ring so the judge can view structural correctness and the side profile of your animal. A correct side profile position consists of the front feet set even while the back feet are staggered with the judge's side back foot being further back. Remember to stay calm while setting up and scratching your animal. Quick, rough movements show nervousness on your part and can make your animal uneasy.

Good sportsmanship is an important part of showmanship. Remember that you are always being watched and often judged by your actions. Work hard, practice before the show, always try to do better next time, gain from your mistakes and above all, always have fun!

Youth for the Quality Care of Animals (YQCA)

Youth for the Quality Care of Animals (YQCA) is a new, national, multi-species livestock quality assurance program available for youth ages 8-21. This annual educational and certification program focuses on food safety, animal well-being, and character awareness for youth producing and/or showing livestock. The species covered by the training are swine, beef cattle, dairy cattle, sheep, goats, market rabbits, and poultry. Extension specialists, the National Pork Board, national show organizers, and animal industry representatives were involved in designing the program with the intent to provide a national, standardized livestock quality assurance program applicable to multiple species. The curriculum is designed to provide different age-appropriate modules annually, so youth will expand their knowledge by learning about new topics every year. There are two options by which youth may obtain their YQCA certification; they may attend a 60-minutes face-to-face training with a certified instructor, or they may complete the age-appropriate online certification course. There is a \$3/child fee for the face-to-face training, while the online certification course is \$12/child. The YQCA program has been integrated into the 4HOnline system, so families may register for a face-to-face training, or complete the online certification, by logging in using their 4HOnline credentials. There is also an option to create an independent account for FFA members.

Youth swine exhibitors in the Kansas State Fair Grand Drive and/or Kansas Junior Livestock Show (KJLS) are currently required to complete Youth PQA Plus training and have an active certification number in order to participate. This information is submitted as part of the state nomination process. The Youth PQA Plus requirement will continue for 2018, however, Youth PQA Plus or YQCA certification will be accepted. The National Pork Board has announced that the Youth PQA Plus program will be discontinued on June 1, 2018. At that point, all youth seeking livestock quality assurance training will need to use the YQCA program. For those youth who previously tested out of their age division through the Youth PQA Plus program and earned a multi-year certification, those certifications will be honored until they expire.

For more information about YQCA, please visit www.yqca.org, contact your local Extension Office, the K-State Youth Livestock Coordinator, Lexie Hayes, at adhayes@ksu.edu or (785)532-1264, or State 4-H Specialist, Pam Van Horn, at pvanhorn@ksu.edu or (785)532-5800.



YQCA
YOUTH QUALITY CARE ANIMALS

Home About More Info Fairs & Shows Buy Coupons Contact Sign In/Register

A NEW OPTION FOR YOUTH LIVESTOCK EDUCATION

SIGN UP OR LOG IN

www.yqca.org

Notes:

K-State Youth Livestock Program

Website:

www.youthlivestock.ksu.edu

Facebook:

Kansas State Youth Livestock Program
@ksuyouthlivestock

Snapchat:

K-State Youth Livestock Program
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