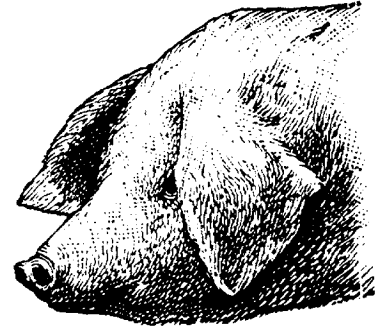


4-H Livestock Judging Manual



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Introduction

Livestock judging is a process of evaluating, selecting, placing, and learning the various livestock species—beef cattle, sheep, and swine. Judging is the foundation of any 4-H livestock project. Feeding, exercising, grooming, and showing the animal are all important aspects of your 4-H project; however, none may be as exciting as selecting your project animal. Selection of project animals is actually judging livestock, comparing the merits of one animal against the merits of other potential project animals. This selection process is just one of many applications of livestock evaluation and judging.

Livestock producers, breeders, feeders, buyers, and packers evaluate livestock for their potential as either breeding or market animals. These people try to relate the “form” of an animal with the “function” it is intended to serve. That is why livestock judging is often called the application of “form and function” to livestock.

Why Judge Livestock?

Stockpersons judge livestock to differentiate between superior, average, and inferior animals within each of the livestock industries. They are looking for the most desirable animals for their particular needs. Stockpersons often compare their own livestock to those of others. Using their judging knowledge and skills, producers analyze the potential value of animals for particular purposes.

As a result of reading this manual; listening to your parents, 4-H leaders, and county Extension agents; and practicing on your own, you should be able to do the following:

- Identify the different breeds of livestock
- Compare livestock for their merit and value as either breeding or market animals
- Look at an animal and determine desirable characteristics and faults
- Improve your livestock project by selecting more desirable animals and gain an appreciation of their value for a particular purpose
- Make decisions and defend them in a logical, well-organized manner
- Make complex decisions based on available information
- Develop confidence
- Develop oral communication skills
- Appreciate the opinions of others

Breeds of Livestock

Before learning to compare animals of the same breed, you need knowledge of the most popular breeds. This manual outlines distinguishing characteristics of the major breeds within each species: beef cattle, sheep, and swine. Use the pictures under each species as a reference.

Livestock Judging

Basics

After learning why livestock are judged, you can begin to appreciate why it takes considerable practice to become a good judge of livestock. In this section, you'll learn about the placing card, a class of livestock, and the livestock judging contest.

Placing Card

The placing card is the official record of how a person placed a class. Every time you judge a class of livestock, you will be given a placing card. The type of placing cards used in Mississippi contests is shown in Figure 1. Other contests may use similar placing cards.

Be sure to complete the requested information on the card, including your team number and contestant number (example 1-A) and the class name and number (example 4 – Angus Heifers). Finally, draw a circle around your desired placing in the bottom section of the card.

In the example, contestant 1-A placed Class 4, Angus Heifers, 3-1-4-2. This placing indicates that the most desirable animal is number 3 and the least desirable animal is number 2.

Be sure each card you turn in has your contestant number and that you have indicated the name of the class. Circle only one placing on your judging card, and check your placing before turning in your card.

Class of Livestock

A class in a livestock judging contest consists of four animals of one particular breed, sex, and age group, such as Suffolk Yearling Ewes, Dorset Ram Lambs, Crossbred Market Hogs, Duroc Boars, Summer Yearling Hereford Bulls, and Brangus Heifer Calves. The animals will be numbered 1, 2, 3, and 4 so they can be readily identified. Numbers will probably be on the backs or arms of the people holding the animals. A possible exception to this system is when judging beef cattle or sheep and the animals are haltered or are being held in racks. When this is the case, number the animals from left to right as you stand behind them.

Livestock Judging Contest

A livestock judging contest includes classes of beef cattle, sheep, and swine. You may judge either market or breeding classes or both. If you place the class correctly, you will receive a score of 50 points for the placing. If you incorrectly place one or two pairs, or if you make other placing errors, your score will be determined by the seriousness of the error.

In many judging events, you will have the opportunity to give oral reasons. Oral reasons allow you to justify your placings to an official judge. The official judge will score you on accuracy,

4-H Judging Contest Placing Card

Form 672

Your Number 1-AClass 4 - Angus Heifers

Placing (circle)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
4	3	4	2	3	2	4	3	4	1	3	1	4	2	4	1	2	1	3	2	3	1	2	1
1	2	3	4	1	4	2	1	3	4	2	4	3	1	2	3	4	1	2	3	4	1	2	3
1	2	3	4	1	4	2	1	3	4	2	4	3	1	2	3	4	1	2	3	4	1	2	3

Figure 1. Placing card.

completeness, length, presentation and delivery, and terminology. A score of 50 points is the highest awarded for oral reasons. Detailed information on reasons can be found in the Reasons section of this manual.

A livestock judging contest is simply a collection of various classes of livestock. There can be as many classes in a contest as the officials desire; usually, there are at least two classes.

Always follow the instructions of your group leader or the person in charge of the contest. If you have any questions, ask your group leader and not another contestant. No talking between contestants is allowed during the contest.

As you approach a class of livestock, you will probably be told to turn your back toward the class and to label your placing card. Do not begin judging until told to do so!

Once "time is in," begin judging. You will have from 10 to 15 minutes to place a class, with most classes being 15 minutes. With approximately 2 or 3 minutes remaining in a class, you will be asked to mark your card. Make certain that your contestant number, class name and number, and placing are on the card. When "time is out," turn your back toward the class, check your placing one last time, and hand your placing card to your group leader.

How to Begin

Before you start judging livestock, try to make a mental image of the perfect animal. Do this by recalling the most desirable features of the high-quality animals that you have seen and by thinking of them as belonging to one animal. You can also study pictures of champions, show reports,

current livestock magazines, or ideal-type pictures from the breed associations.

In the contest system, four animals are typically in each class. As you judge, divide the class into three pairs: a top pair, a middle pair, and a bottom pair. Make comparisons between these pairs. As you look at any class, have five animals in mind: the four in the class and the ideal animal of that breed, sex, and age group.

Developing a Judging System

Each time you judge a class of livestock or analyze a group of livestock, rely on a system of observing the animals.

Following are a few pointers for judging a class of livestock:

- **Stand Back** – Allow enough room between yourself and the animals so you can see all four animals at once. Usually, 25 to 30 feet is a good distance from which to view the class. Become skilled in placing the classes from a distance, and handle the animals only to confirm your observations. It is a mistake to place a class only with your hands. An exception is market lambs, which are often placed on visual appraisal as well as on handling.
- **Three Angles** – Try to look at the class from the side, front, and rear views. Compare each animal to the others in the class and to the "ideal" animal that you have pictured in your mind.
- **Big Things First** – Always look for and analyze the good and bad characteristics of each animal in the major areas such as frame size, volume, condition, muscling, balance, structural correctness, movement, and breed character. Learn to study the animals carefully. Concentrate on the

parts of the animal that yield the high-priced cuts. A keen judge of livestock is orderly and never haphazard. Make your placings according to the big things, unless a pair of animals are very similar, causing you to analyze the minor differences between the animals.

- **Place the Class** – Once you have analyzed the important factors that go into placing a class, place the class. Mark your placing at the top of your notebook or reasons card, and begin taking notes. A more thorough discussion of note-taking and reasons format is in the Oral Reasons section of this manual.
- **Close Inspection** – Usually, you will be given some time for close inspection of a class. When you are near the animals for close inspection or handling, simply confirm the decisions you made at a distance. If an animal appears different (or handles differently) from what it looked like from a distance and if the difference merits consideration, then change your placing. Close inspection is different for each species, so they will be dealt with separately.
 - **Beef Cattle** – During close inspection of beef cattle, you probably will not be permitted to handle breeding animals, but you may be allowed to handle animals in a market class. If you are permitted to handle the animals, move quietly and cautiously so you don't excite or frighten the animals. (See the Handling Market Steers section.)
 - **Sheep** – During close inspection of sheep, you may or may not be permitted to handle breeding and market classes. Again, move quietly and cautiously so the animals do not become nervous or excited. See the Handling Market Lambs section in this manual for the preferred method of handling sheep.
 - **Swine** – There are no predetermined guidelines for close inspection of swine because hogs are usually judged loose in a pen. At any time during the class, you may kneel and look at underlines, ear notches, or feet and legs. Make this part of your normal routine for judging pigs.

Stand Back and Take Notes

Even if it is not a reasons or questions class, write down a few notes on why you placed the class the way you did. If it is a reasons class or a class with questions, stand back from the class and write your notes for reasons. If you are unsure of something, either try to look at it again or omit it. If you are unsure and guess, you will probably be wrong. Try to be accurate and descriptive when writing notes, and remember what the animals look like.

Oral Reasons

Good judges of livestock have a special quality that an average judge does not possess. A good judge can accurately and concisely describe an animal or group of animals so that an audience knows exactly what the judge saw. The ability to describe animals accurately and concisely is the basic foundation of the reasons process. This section is devoted to reasons, starting with the basics and ending with a lengthy list of terminology.

Giving reasons will help you do the following:

- Develop a system for analyzing a class of livestock
- Think more clearly on your feet
- Organize and state your thoughts more clearly
- Improve your speaking poise and presentation
- Improve your voice
- Develop your memory

You should know the parts of the various livestock species and how they join to make a particular breeding or market animal. Every animal is different and so is every class of livestock. Therefore, there are no guidelines or rules for placing a class. Nor is there a right way or a wrong way to deliver or present a set of reasons.

How Good Are Your Oral Reasons?

The judge will determine the value of your reasons by the following:

- **Accuracy** – You must tell the truth. You must see the important things in the class correctly. Accuracy is very important. You will lose points for incorrect statements.
- **Completeness** – Describe all the major differences in your reasons. Omit small things that leave room for doubt.
- **Length** – A well-organized, properly delivered set of reasons must never be more than 2 minutes in length.
- **Presentation and Delivery** – Present your reasons in a logical manner that is pleasant to hear, clear, and easy to follow. If reasons are poorly presented, the value of accuracy may be lost because most of what you say doesn't "get through" to the listener. Speak slowly and clearly in a conversational tone. Speak loudly enough to be understood, but avoid talking too loudly or too rapidly. Use well-organized statements and correct grammar. Emphasize the important comparisons and be confident in your presentation.
- **Terminology** – Use correct terminology. Incorrect terminology greatly detracts from the value of your reasons. Study and use the terms in the Terminology for Oral Reasons section.

Rules for Giving Oral Reasons

- Do not claim strong points for one animal unless the animal has them. Claim the points when one is superior, and then grant to the other animal its points of advantage.
- Strongly emphasize major differences. Present the important differences first on each pair.
- Be concise and definite. Don't search for things to say. If you don't remember, go on to the next pair you are to discuss.
- State your reasons with confidence and without hesitation. Talk with enough energy and enthusiasm to keep the judge interested, but do not yell or shout.
- End reasons strongly. Give a concise and final statement on why you placed the fourth-placed animal last.
- Be sure you have your reasons well organized so you do not hesitate when you present them to the judge.

The most important factors that go into an effective set of reasons include the following:

- Accuracy
- Organization
- Delivery
- Terminology

Let's review these factors to improve your set of reasons.

Importance of Accuracy

Accuracy is the most important aspect of a good set of reasons. Not only must you be able to see important differences among animals, but you must be able to describe these differences accurately. Two animals may be extremely similar except for one or two minor differences, or they may be extremely different and have very little in common. In your reasons, you must be able to identify the important differences and similarities among animals and convey these traits to the judge. The official judge will want you to paint a picture of the animals by using the proper terminology to describe the animals.

Correct phrases about the livestock are the foundation of accuracy. Claim strong points for an animal only if the animal has them. Do

not try to make small differences into big placing points. Furthermore, do not try to impress the judge with a discussion of every point that is different among animals. Discuss only the most important reasons for placing one animal above another.

Organization of a Set of Reasons

Organization is the second important factor that should be a part of your reasons. It is easier for the person listening to you to understand what you are saying if you present things in a logical, well-ordered fashion. This organization begins with taking notes. If your notes are organized, your reasons will be organized.


4-H JUDGING REASONS NOTECARD		<u>Identification</u>
Class Name _____ Placing _____		1.
Opening Statement _____		2.
_____		3.
_____		4.
Top Pair – Reasons for _____ over _____	Grant to _____	
	Criticize _____	
Middle Pair – Reasons for _____ over _____	Grant to _____	
	Criticize _____	
Bottom Pair – Reasons for _____ over _____	Grant to _____	
	Criticize _____	
I placed _____ last because:		
		
<small>Mississippi State University is an equal opportunity institution.</small>		<small>Form 655 (06-25)</small>

Figure 2. Oral reasons card.

In your reasons, divide a class into three pairs: a top pair, a middle pair, and a bottom pair. Your notes for reasons also should be divided into three pairs.

When taking notes, use either the 4-H Judging Reasons Notecard (Figure 2) or a notebook (Figure 3), both of which are described in this section. The notecard may be easier for beginners and juniors.

In the notebook example, line A is used for class name and line B for class placing. Section C is for the opening statement for the class. Boxes D, E, and F are for the top pair; boxes G, H, and I for the middle pair; and J, K, and L for the bottom pair. Boxes D, G, and J are for placings; boxes E, H, and K are for grants; and boxes F, I, and L are for faults or criticisms. This outline for note-taking can be used for any class of four animals with any placing.

Sample Notes

When you begin taking notes, always write down the most obvious characteristics first, then underneath the big things, write the details or specific differences.

Reasons Format

The format used for reasons is simple and straightforward and allows for a complete description of a class. This style does require an understanding of livestock evaluation as animals are analyzed in great detail, and you must be able to recognize important differences and place these differences in a priority order.

Below is an outline that demonstrates the basic format:

Figure 3. Notebook.

Section	Example wording
Opening statement	Selecting the most . . . , I chose the alignment of 1-2-3-4 for the (name of class).
Criticism of top animal	I realize that 1 could be
Comparison of 1 over 2	Nevertheless, I used 1 over 2 in the top pair as he was
Grants 2 over 1	Sure, 2 was
Criticism of 2	but, the Duroc barrow is . . . , so he is second.
Comparison of 2 over 3	However, with these faults aside, it is the . . . of 2 over the . . . of 3.
Grants 3 over 2	I recognize that 3 is
Criticism of 3	but at the same time, he is
Comparison of 3 over 4	Even so, in my concluding pair, 3 beats 4. He is a more
Grant 4 over 3	I realize 4 is
Criticism of 4	However, this does not make up for the fact

The type of terminology used in each section of the reasons is important. In the opening statement on the top animal, you may use either descriptive terms or class comparisons. In the pair comparisons, you may use either class comparisons (–est) or simple comparative (–er) terms. Grants are comparative terms or class comparisons. Criticisms are descriptive (no –er terms) or class comparisons.

Properly used, this format will allow you to completely describe all of the important points in a class in a well-organized, easy-to-follow manner.

Transitions

Transitions are a way of moving smoothly from one section of the reasons to another. This is done as simply as possible while still maintaining a smooth transition. We strongly discourage excessively wordy transition statements.

Listed below are words to use when moving into a grant:

- Grant
- Recognize
- Realize
- Concede
- Admit
- Yes

You may want to try something such as this statement: “2 is straighter lined and cleaner fronted, but he is . . .” (move into criticism). Here, we are using only “but” for the transition term, but effective voice inflection is necessary to make this work.

To move into a criticism, use the following language:

- I realize that 1 is . . .; nevertheless, I used him in the top pair over 2 as he was . . .
- But he is the lightest muscled, barest handling . . .
- But I criticized 2 and left him second, as he was . . .
- But I faulted 2 and placed him second, as he was . . .

When moving into another pair, here are some transitions that can be used:

- Still, in the bottom pair, I used 3 over 4.
- Nonetheless, in the top pair of heavier muscled gilts, it’s 1 over 2.
- Nevertheless, in the middle pair, I used 2 over 3.
- Even so, in the bottom pair . . .
- However, in the middle pair . . .

Just a Brief Word About Originality

Experiment with different transitions and phrasings. Try them on the coach, and if he or she doesn’t like them, you will be the first to know. Note to the juniors: Get the basics down first, then start finding original ways to say things.

Sample Set of Reasons

I placed the Angus Heifers 3-1-4-2.

I started the class with 3, the heaviest muscled, highest volumed, growthiest heifer in the class. Ideally, I would like to see her longer necked and smoother shouldered! Even so, I used 3 over 1, as she was a larger framed, heavier muscled, bigger volumed, growthier heifer. She was a longer bodied, taller topped heifer that has more arch and spring of rib, with more width and natural thickness down her top and through all portions of her quarter. In addition, she appeared to have a higher weight per day of age. However, I do admit that 1 was a more feminine-fronted heifer, being more refined about her head, longer necked, and laid in smoother about her shoulder, but she was a shallower ribbed, lighter muscled heifer that is pinched in her forerib.

Coming to my middle pair, I placed 1 over 4 because she was a more feminine, longer bodied, and more structurally correct heifer. She was especially smoother through her neck/shoulder junction, longer sided, and stood more squarely on her feet and legs. Granted, 4 was a heavier muscled, more ruggedly designed heifer that stood on more substance of bone, but I criticized her for being a more conventional, coarser shouldered heifer that was cow hocked and splay footed.

Dropping to my bottom pair, I placed 4 over 2 as she was a heavier, bigger volumed, heavier muscled heifer that stood on a greater diameter of bone. She had more arch and spring through a deeper rib, with more thickness down her top and a greater volume of muscle from hip to hock. However, 2 was more feminine, leaner about her neck, and smoother shouldered. Nonetheless, 2 was the smallest framed, lightest muscled, narrowest made heifer in the class and stood on the finest bone with the lowest weight per day of age.

Thank you.

Delivering a Set of Oral Reasons

Delivery is the third factor that is necessary for a good set of reasons. Everyone is nervous the first time they give a set of reasons, but with practice, it will become easier. These six factors for delivering a good set of reasons will help you:

- **Flow** – The way you put words together into phrases, sentences, and paragraphs is considered flow. A group of short, choppy phrases, each standing alone, is boring and difficult to follow. A group of long, smooth-flowing phrases is enjoyable for the listener. Begin your reasons at one speed and keep a similar pace throughout the entire set. Don't talk too quickly or too slowly. Speaking without hesitation will allow you to receive a higher score for your reasons. The only times to pause are between pairs and when you need to take a breath. Follow every set of reasons with a sincere "thank you."
- **Inflection** – Voice inflection is one of the most important items in your delivery. Place emphasis on the words that describe the important characteristics of each animal. Careful selection of key words to emphasize will take some practice, but in time, it should become a normal part of your oral reasons.
- **Volume** – The volume you use to deliver your reasons will depend on how you normally speak and the size of the room. If you are soft spoken and are in a large room, increase the volume of your voice in order to be heard and understood clearly. If you are normally loud and are giving reasons in a small room, decrease the volume of your voice so it doesn't echo.
- **Eye Contact** – Try to look at the person who is listening to your reasons. If you maintain eye contact throughout the entire set, your reasons will be more professional. Direct your discussion toward the official even if you do not look the judge straight in the eye. It is easier for some people to look at the top of the judge's head when giving reasons rather than looking directly in their eyes. You will receive a higher score if you do not gaze into space or look around the room.
- **Distance** – Depending on your voice and stature, the distance you stand from the judge will vary. A short, soft-spoken person should stand closer to the judge than a tall, deep-voiced person whose voice carries well. Nonetheless, 6 to 10 feet is generally adequate.
- **Stance** – When giving a set of reasons, make the situation as comfortable as possible for the judge and for yourself. Stand upright, with your hands behind your back or folded at your waist. Place your feet squarely at shoulders' width. Avoid rocking back and forth or rolling on the balls of your feet.

Terminology for Oral Reasons

Terminology is the fourth and final factor that goes into an effective set of reasons. Try to put the words and phrases together in a well-organized, logical fashion when describing livestock. Be sure to describe only what you see, and never invent things that are not there.

It is important to know the meaning of every term or phrase you use. An official who is unfamiliar with a certain term may ask you to define it further. As you look over the terms, try to picture an animal with the characteristics described by the terms, or terminology. If you are uncertain about the exact meaning of a term or phrase, ask your parents, 4-H leader, or Extension agent.

More desirable and less desirable characteristics are listed on the terminology pages for several traits of each species (beef, sheep, swine). Use caution when applying the terminology in a set of reasons; in some instances, a desirable characteristic in one situation may actually be an undesirable characteristic in another (for example, larger framed versus smaller framed). Furthermore, not every term in the lists has an appropriate opposite term; if there is no term, it is shown as a long dash (—). For terms that contain a blank, insert the appropriate part of the animal you are describing.

Beef Cattle

Breeds of Beef Cattle

Table 1 outlines some breeds of beef cattle that are common in the United States. Each breed is categorized by frame size, muscling, mature cow weight, milking ability, and some of the more distinguishing features of the breed.

Frame size is divided into three categories: small, average, and large. Muscle is divided into three categories: flat, medium, and thick. Average mature cow weight is listed in pounds and describes the size of cows of this breed relative to other breeds.

It is important to remember that this table is for reference only. As much variation exists within a particular breed of livestock as among breeds for such characteristics as milking ability, muscle, and so on. Therefore, the data contained in this table represent averages, not absolute values, for particular breeds. The table is provided as a reference to help you better distinguish one breed from another.

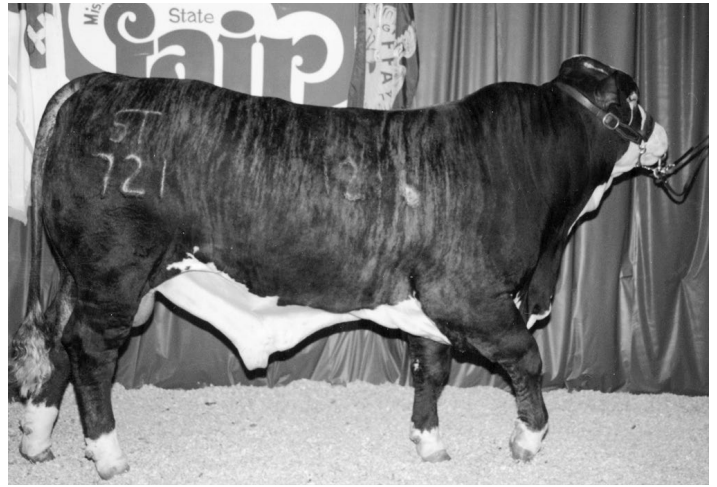


Table 1. Breeds of beef cattle. Birth, wean, and post-wean weight rankings are 1 (most desirable) through 5 (least desirable). A dash indicates insufficient data for comparison. Adapted from Beef Production and Management, 2nd edition, 1979, Gary L Minish and Danny G. Fox.

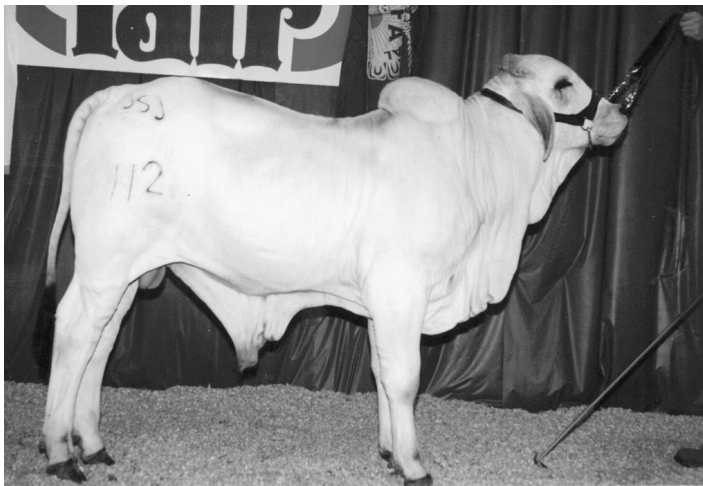
Breed	Frame size	Muscle	Average cow weight	Birth weight	Wean weight	Post-wean weight	Characteristics
Angus	avg.	med.	1,100	2	4	4	black; polled; pigment; fertility
Beefalo	small	med.	varies	—	—	—	brown; 3/8 Buffalo, 5/8 Bovine
Beefmaster	avg.	med.	varies	4	2	2	1/2 Brahman, 1/4 Hereford, 1/4 Shorthorn
Blonde d'Aquitaine	large	thick	1,500	4	3	2	blonde; terminal sire
Braford	avg.	med.	1,250	—	—	—	reddish; 3/8 Brahman, 5/8 Hereford
Brahman Brangus	avg.	med.	1,400	4	1	3	various colors; heat tolerance; "hump" black or red; 3/8 Brahman, 5/8 Angus
Brahman Brangus	avg.	med.	1,250	3	3	3	various colors; heat tolerance; "hump" black or red; 3/8 Brahman, 5/8 Angus
Charbray Charolais	large	med.	1,500	—	—	—	whitish gray; 3/8 Brahman, 3/8 Charolais white; muscle; growth
Charbray Charolais	large	thick	1,550	5	1	1	whitish gray; 3/8 Brahman, 3/8 Charolais white; muscle; growth
Chianina	large	med.	1,600	5	1	1	white, silver, brindle, or black; terminal sire
Devon	small	flat	1,100	3	4	2	dark red; carcass quality
Galloway	small	flat	950	3	4	3	black; long, curly hair; late maturing
Gelbvieh	avg.	thick	1,450	4	1	2	pale brownish-orange; milk; growth
Hereford	avg.	med.	1,100	3	4	3	red with white face; adaptability; fertility
Limousin	avg.	thick	1,300	4	3	3	pale brown, golden; muscle; cutability
Longhorn	small	flat	varies	1	5	5	various colors; late maturing; long, slender horns
Maine-Anjou	large	thick	1,600	5	1	1	deep red and white; frame; growth rate; muscle
Marchigiana	large	thick	1,500	—	—	—	grayish-white; muscle; terminal sire
Murray Grey	small	med.	1,150	3	3	4	gray; low birth weights
Pinzgauer	avg.	thick	1,350	4	2	2	brown with white topline, underline; hardiness
Red Angus	avg.	med.	1,100	2	4	3	red; polled; fertility
Salers	avg.	med.	1,300	—	—	—	dark red or black; low birth weight; growth
Santa Gertrudis	large	med.	1,450	4	2	3	deep red; 3/8 Brahman, 5/8 Shorthorn
Scotch Highland	small	flat	900	2	4	4	dun; long, dense, shaggy hair
Shorthorn	avg.	med.	1,100	3	4	3	red, roan, or white; calving ease; early maturing
Simmental	large	thick	1,500	5	1	1	red, cream, or black with white; muscle; milk
South Devon	large	flat	1,450	—	—	—	light red; milk; growth rate



Angus



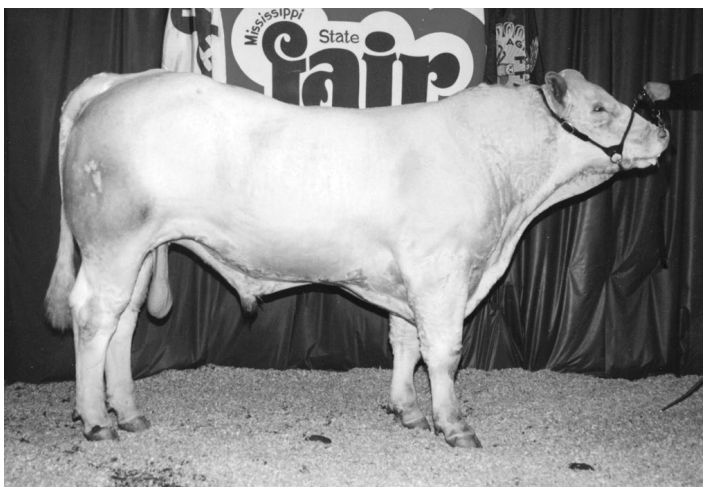
Beefmaster



Brahman



Brangus



Charolais



Hereford



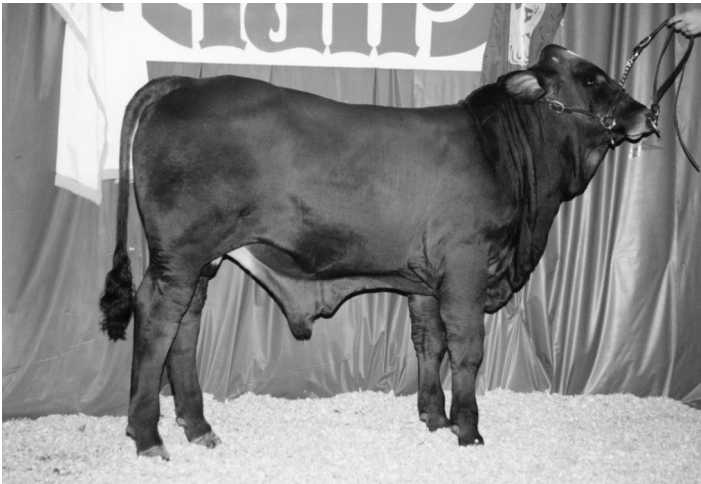
Limousin



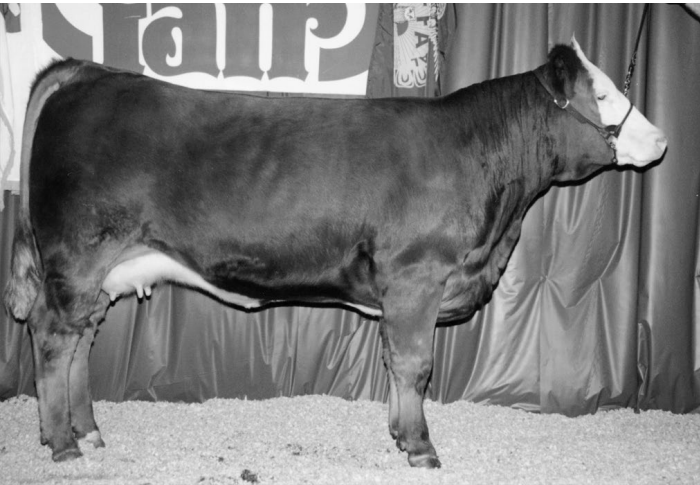
Santa Gertrudis



Shorthorn



Simbrah



Simmental

Parts of Beef Cattle

After you have become familiar with the breeds of beef cattle, learn the external parts and carcass regions. This section provides diagrams of the external parts (Figure 4), characteristics of an ideal breeding heifer (Figure 5), and characteristics of an ideal market steer (Figure 6). Take time to study all of the parts and to become familiar with them so you can refer to them without hesitation. Use these terms as part of your reasons.

Characteristics of the ideal breeding heifer and the ideal market steer are included for reference only. Depending on the location and production situation, an ideal can take on various shapes and forms.

Feet and leg placement is illustrated in Figures 7 through 10.

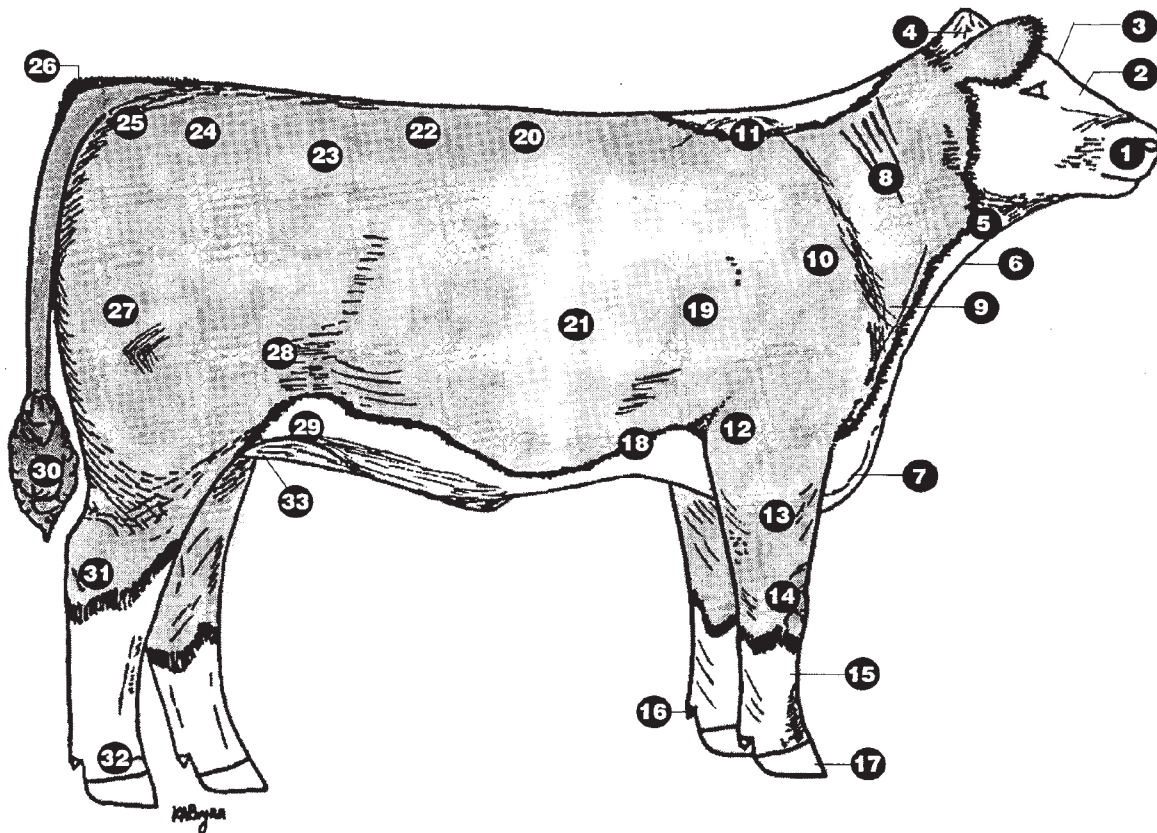


Figure 4. External parts.

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

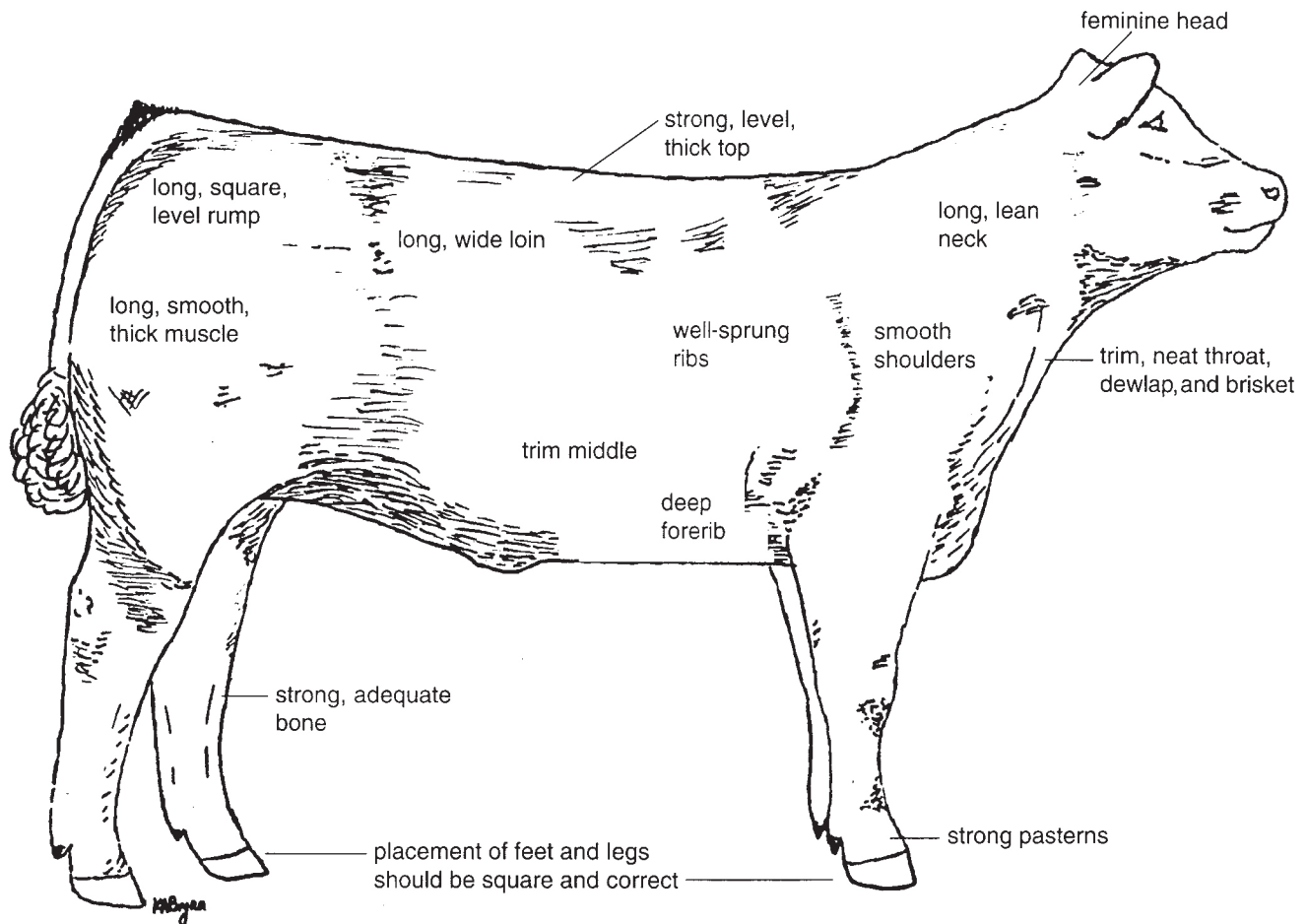


Figure 5. Characteristics of an ideal breeding heifer.

- feminine head
- long, lean neck
- trim, neat throat, dewlap, and brisket
- smooth shoulders
- well-sprung ribs
- deep forerib
- trim middle
- strong, level, thick top
- long, wide loin
- long, square, level rump
- long, smooth, thick muscle
- strong, adequate bone
- strong pasterns
- placement of feet and legs square and correct

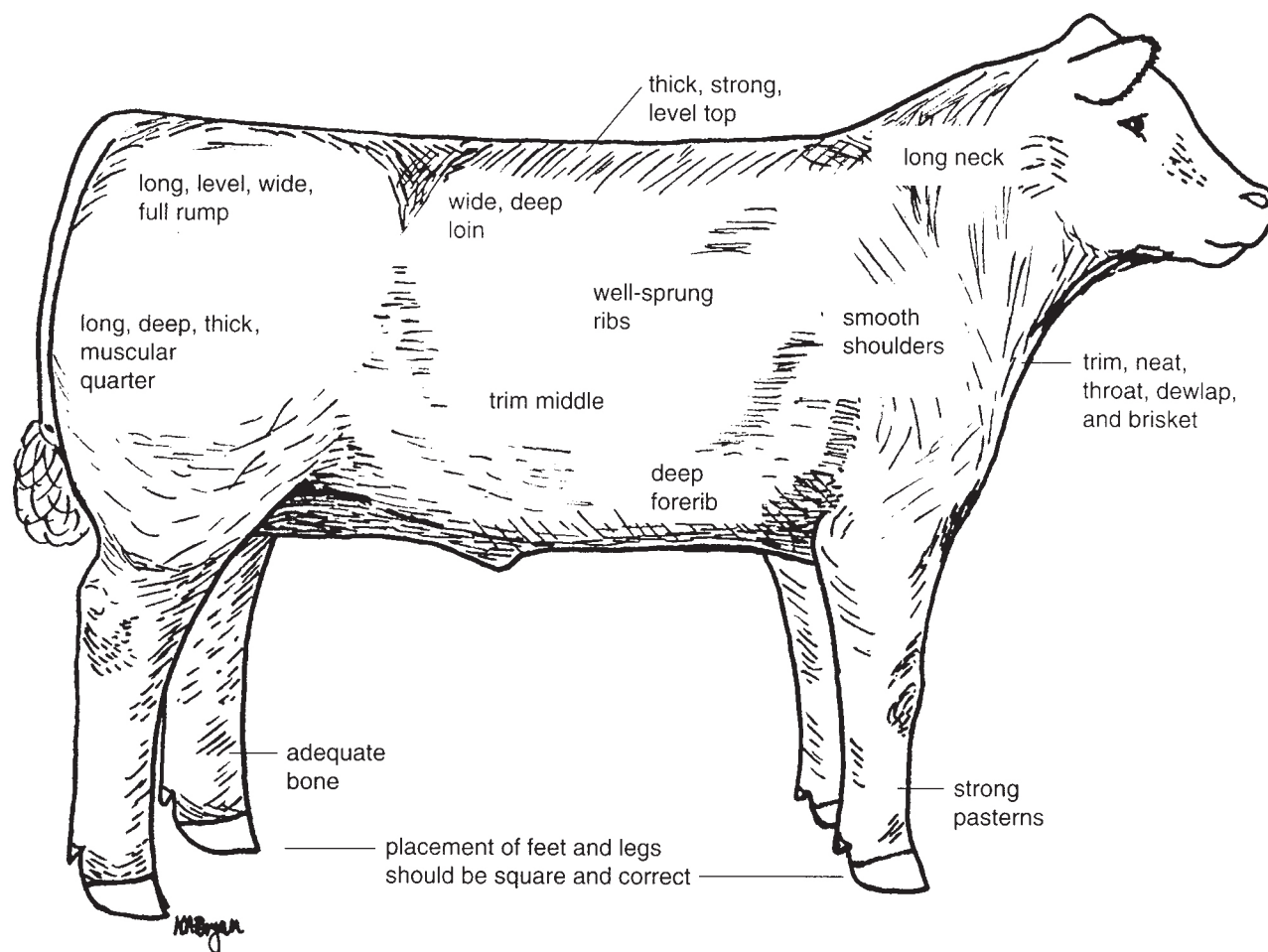


Figure 6. Characteristics of an ideal market steer.

- long neck
- trim, neat throat, dewlap, and brisket
- smooth shoulders
- well-sprung ribs
- deep forerib
- trim middle
- thick, strong, level top
- wide, deep loin
- long, level, wide, full rump
- long, deep, thick, muscular quarter
- adequate bone
- strong pasterns
- placement of feet and legs square and correct

Market steer characteristic	Normal range	Average	Ideal
Live weight (lb)	900–1,400	1,150.0	1,220.0
Dressing percentage	55–67	62.0	62.0
Fat thickness (in)	0.15–1.0	0.50	0.30
Ribeye area (sq in)	8–16	11.5	13.3
KPH fat percentage	1–6	3.5	2.0
Quality grade	Low Select–Avg. Prime	Low Choice	Avg. Choice

Adapted from *Live Animal Carcass Evaluation and Selection Manual*, 4th edition, 1993, Donald L. Boggs and Robert A. Merkel.

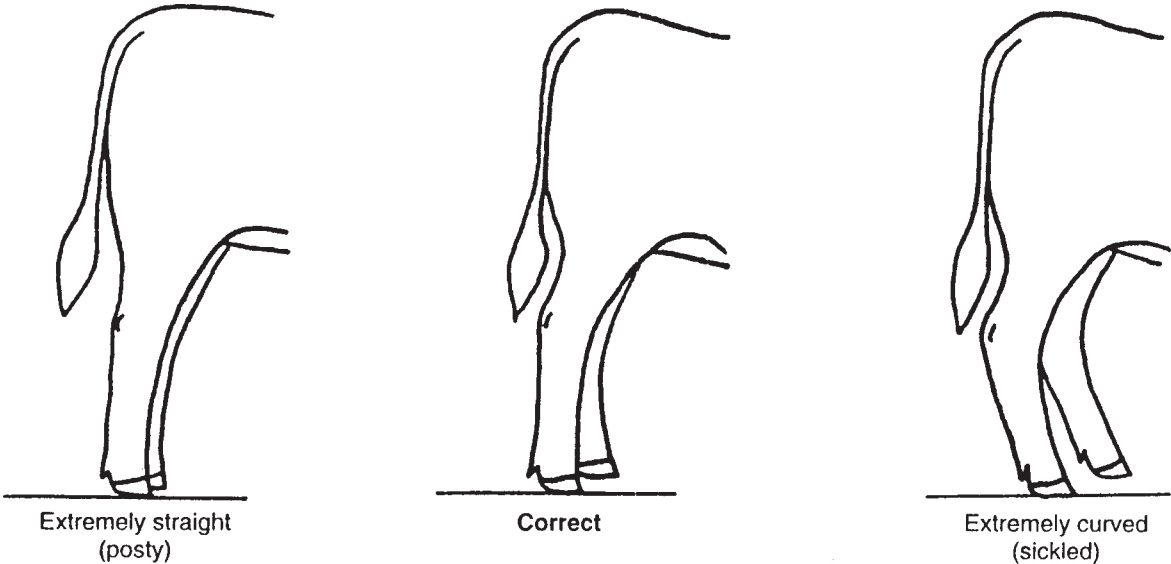


Figure 7. Ideal market steer feet and leg placement.

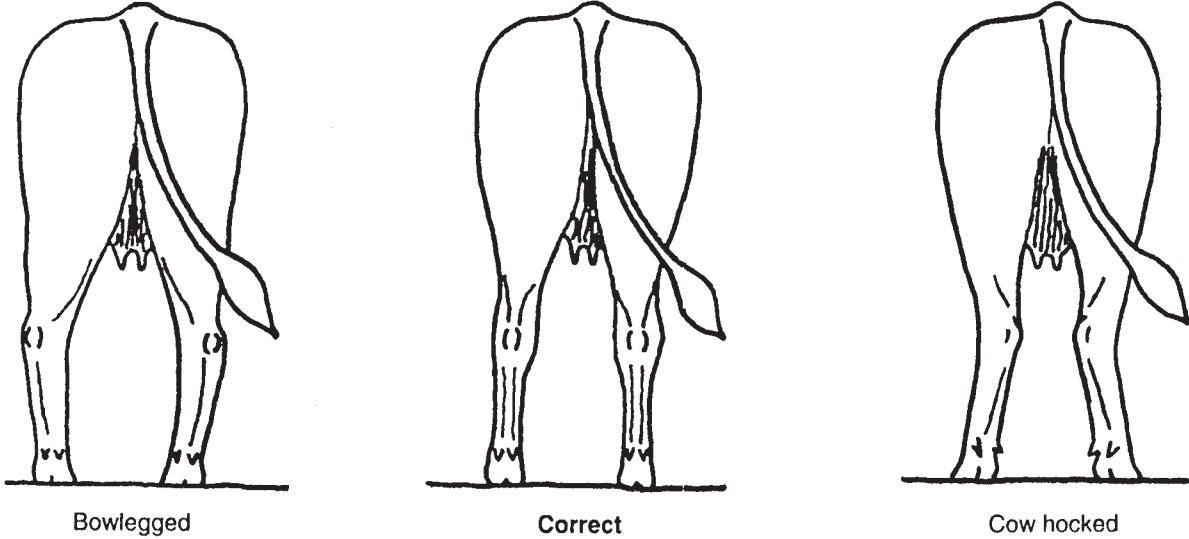


Figure 8. Ideal market steer rear leg alignment.

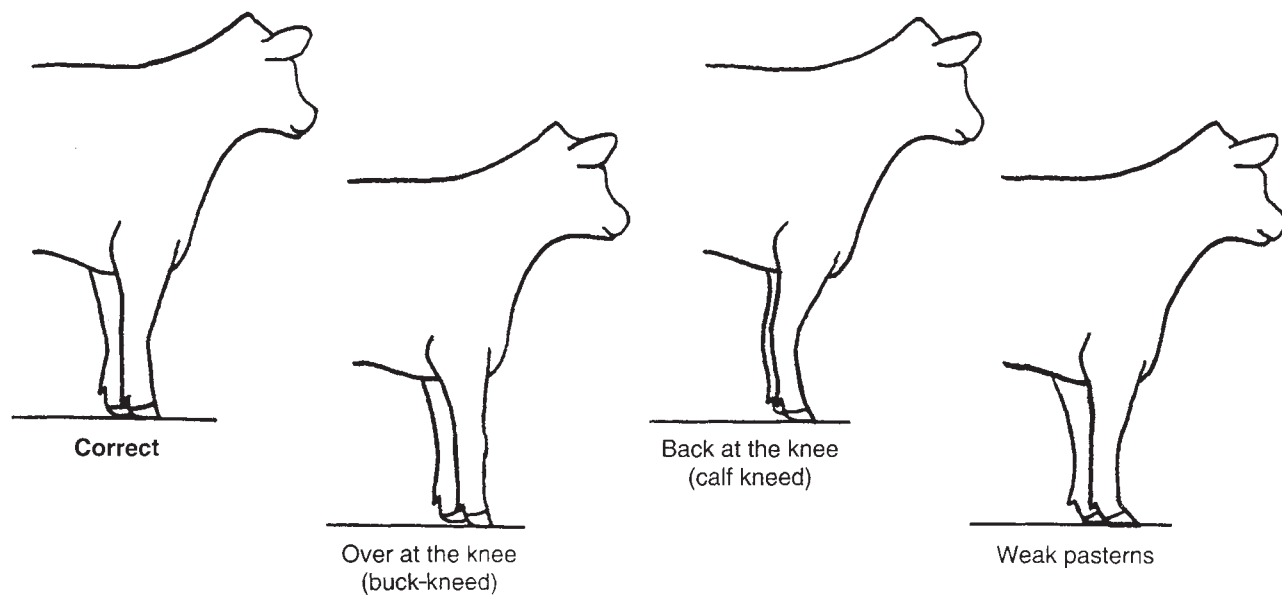


Figure 9. Ideal market steer front leg set.

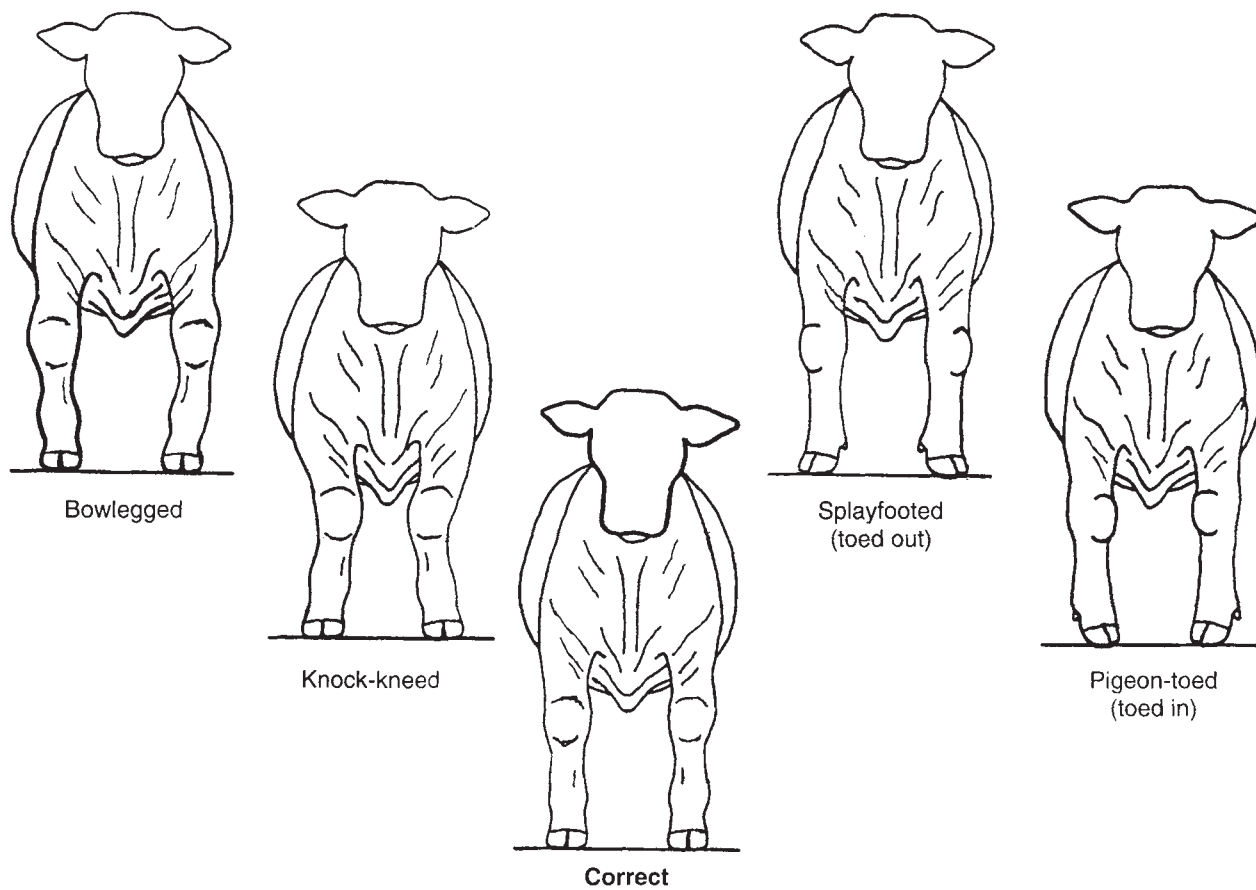


Figure 10. Ideal market steer front leg alignment.

Handling Market Steers

There are no predetermined guidelines for handling steers. The primary objectives when handling steers are to estimate

accurately the amount and uniformity of finish and to determine the quantity of muscle in the loin—and maybe in the rump or quarter—as an indicator of total muscle volume.



Step 1. With fingers extended and together, place the palm of your hand and fingertips on the steer at the top to determine the quantity of muscle down his top. Heavily muscled steers will be wide and full; lightly muscled steers will be narrow. Move your hand down his topline and toward his loin.

Cup your hand and place the palm of your hand on the loin of the steer and evaluate the depth and width of his loin. The loin should be wide and deep with muscle.



Step 2. Determine the amount of finish over the last rib and along the edge of the topline, progressing toward the top of his shoulder.



Step 3. Determine the finish behind the shoulder of the steer.



Step 4. Move your hand toward his last rib. Analyze the amount and uniformity of finish over the various areas of the steer's rib region. Press firmly to detect the differences between fat, muscle, and bone. Fat will feel soft, like jelly; muscle will feel firm; and bone will feel hard.

Beef Cattle Terminology

General

More Desirable Characteristics	Less Desirable Characteristics
more progressive	conventional
more dimensional	—
stouter	needs more size and performance
more upstanding	—
growthier	lacks growth and do-ability

Structure

More Desirable Characteristics	Less Desirable Characteristics
fault free	ill structured
problem free	poorer structured
straighter lined	slack framed
more structurally correct	structurally incorrect, poorer structured
better balanced	more off-balance, poorly balanced
tighter framed	—
stronger topped, loined	weaker topped, loined
squarer, leveler rumped	dropped at the pins
higher and wider at the pins	narrower at the pins
more nearly level in the rump	steeper in the rump

Frame and Growth

More Desirable Characteristics	Less Desirable Characteristics
more moderate framed	smaller framed or larger framed
larger framed	smaller framed
smaller framed	larger framed
more size and scale	lacks size and scale
longer _____	shorter _____
more ruggedly designed	finer boned, frailer made
higher weight per day of age	lower weight per day of age
more performance oriented	lacks growth and performance

Head, Neck, Chest, and Shoulder

More Desirable Characteristics	Less Desirable Characteristics
fresher appearing	staler appearing
later maturing	earlier maturing
more future growth potential	less future growth potential
more extended through the front end	shorter fronted
longer, leaner neck	shorter, leathery fronted
laid in more neatly about the shoulder	coarser fronted
smoother, tighter shouldered	more open shouldered
smoother neck/shoulder junction	coarser neck/shoulder junction
more desirable slope to the shoulder	straight shouldered
wider chested	narrower chested

Condition

More Desirable Characteristics	Less Desirable Characteristics
trimmer, cleaner patterned	—
cleaner conditioned	heavy conditioned
more ideal in (his/her) condition	less ideal in (his/her) condition
trimmer dewlap, brisket	wastier through the front end
easier fleshing	harder doing, harder fleshing

Volume and Capacity

More Desirable Characteristics	Less Desirable Characteristics
wider sprung	narrower made
deeper _____	shallower _____
more capacious, higher capacity	less capacious
bigger volumed	less volume
more dimensional _____	less dimensional _____
more arch and spring of rib	flatter ribbed
bolder spring of rib	pinched in the forerib
longer ribbed	shorter ribbed
more dimension through center of the rib	less dimension through center of the rib

Muscle and Muscle Design

More Desirable Characteristics	Less Desirable Characteristics
longer, smoother muscle design	shorter, tighter muscle design
_____ muscle make-up	—
heavier muscled	lighter muscled
thicker made	—
deeper quartered	shallower quartered
thicker top	narrow topped
thicker loin	—

Feet and Legs

More Desirable Characteristics	Less Desirable Characteristics
stood on more bone	stood on finer bone
heavier boned	finer boned
stood on more rugged bone	stood on finer bone
stood squarer in (his/her) foot placement	splayfooted, pigeon-toed, toes out
greater diameter of bone	finer boned
stands wider both front and rear	stands narrower both front and rear
more desirable set to the hock	posty legged, sickle hocked
stronger pasterns	weak pasterned

Stride and Movement

More Desirable Characteristics	Less Desirable Characteristics
more mobile	restricted in (his/her) movement
more fluid moving	stiff strided
easier moving, sounder footed	restricted in (his/her) movement
moved out freer and easier	shorter strided
farther reaching in (his/her) stride	shorter strided
truer tracking	narrower tracking, cow hocked
longer strided	shorter strided
moves with more strength of top	roaches (his/her) top on the move
moves with more levelness of rump	drops (his/her) pins on the move

Bull

More Desirable Characteristics	Less Desirable Characteristics
stouter	—
more powerful	—
cleaner sheath	pendulous sheath
neater sheath	pendulous sheath
more scrotal circumference	less scrotal circumference
greater testicular development	less testicular development
more testicular distention	less testicular distention
more uniform-sized testicles	uneven-sized testicles
testicles hang more correctly	twisted testicles
more ruggedly designed	—
wider chested	narrower chested
more potential to sire calves with [frame, length, volume, growth, muscle, trimness, performance, weight per day]	less potential to sire calves with [frame, length, volume, growth, muscle, —, performance, weight per day]
should sire calves with more [frame, length, volume, growth, muscle, trimness, performance, weight per day]	should sire calves with less [frame, length, volume, growth, muscle, —, performance, weight per day]

Heifer

More Desirable Characteristics	Less Desirable Characteristics
broodier	—
more angular	less angular, coarser
more stylish	—
easier fleshing	harder fleshing
easier keeping	harder keeping
combines correctness, length, and eye appeal	—
nicer brood cow prospect	—
larger vulva	smaller vulva
trim-clean navel	loose, wasty navel

Steer

More Desirable Characteristics	Less Desirable Characteristics
moderate framed	taller
nicer balanced	more off-balance
tighter framed	slack framed
trimmer, cleaner patterned	heavy middled, off-balance
heavier muscled	lighter muscled
more total muscle mass	less total muscle mass
wider, thicker topped	narrow down his top
wider, more expressively muscled	—
longer _____	shorter _____
deeper, wider, thicker quarter	narrower based, lighter muscled quarter
pushes more stifle on the move	—
more ideally finished	patchy, uneven finish
handles with _____	—
cleaner in his condition	—
possesses less waste through _____	wastier, fatter, overfinished
trimmer _____	waistier _____
should rail a carcass with a higher lean-to-fat ratio	should rail a carcass with a lower lean-to-fat ratio
should rail a carcass with a more desirable yield grade	should rail a carcass with a less desirable yield grade

Performance Data for Beef Cattle

Performance data, or performance records, allow producers to objectively evaluate economically important traits associated with livestock production. The major production traits of beef cattle include the following:

- Measurement of reproductive performance and mothering ability
- Quantification of growth rate and efficiency of gain
- Objective analysis of carcass merit

Performance evaluations can be reported as performance records, or as genetic evaluations of those records and of an animal's relatives.

In the past several years, an ever-increasing emphasis has been placed on the understanding and use of performance evaluations. The next sections will discuss the importance and application of performance evaluations to beef cattle judging and the combined use of visual appraisal and performance records (actual or genetic) for live animal selection.

Beef cattle performance data can be listed in several different ways. For example, an Angus bull calf might have a 600-pound weaning weight, or a Polled Hereford heifer

might have a 750-pound yearling weight. Both of these examples represent actual records of the individual, but they don't depict how these animals have performed relative to other animals in the herd. Therefore, a more accurate representation of performance would be to rank animals within the same herd. However, ranking animals within the same herd can be biased if they are born at different times of the year or if they are housed and managed differently. Thus, we often need to rank animals within a contemporary group, which is comprised of animals that are of the same breed, age, and sex and that have been raised in the same management group (same location and access to the same feed).

Generally, use a ratio to rank animals within a contemporary group in the herd. A ratio consists of a number, typically around 100 (average), that compares each animal to the other animals in a particular group. Any number below 100 indicates that the animal's performance was below the average of the group. A ratio of 110 for weaning weight means the animal was 10 percent above average for weaning weight. Likewise, a ratio of 85 for weaning weight means the animal was 15 percent below average for weaning weight. However, use of ratios does not indicate the exact average for a certain trait. Also, ratios may only be used to compare animals within a contemporary group.

When judging livestock and evaluating performance records, select animals for a particular purpose. Ideally, a comparison is made between progeny, or offspring, of one animal with progeny of another animal for a certain economically important trait.

Producers need to be able to compare animals on the same farm that were raised in different contemporary groups or to compare one animal on a particular farm with another animal on a different farm. However, neither actual records nor ratios allow producers to compare animals accurately from different contemporary groups or herds.

In order to compare animals accurately within a breed and across different herds, an expected progeny difference (EPD) must be used. EPDs are a reliable tool to predict the true genetic value of an animal because they consider the individual performance of the animals as well as data from parents, full siblings, and other relatives in all herds that report the information. The biggest advantage is that EPDs allow producers to make comparisons across contemporary groups and herds.

However, you cannot compare EPDs of one breed against EPDs of another breed (for example, EPDs of Brangus cannot be compared to EPDs of Angus). Therefore, a bull with a yearling weight EPD of +55.0 would be expected to sire offspring that are 55 pounds heavier at 365 days of age than

offspring from a bull with a yearling weight EPD of 0 (zero). Likewise, a bull with a weaning weight EPD of +45.0 would be expected to sire progeny that are 30 pounds heavier at weaning than the average of the progeny from a bull with a weaning weight EPD of +15.0.

The student who wishes to excel in beef cattle judging must fully understand the importance and accuracy of using actual records on an individual, ratios from within a herd, and EPDs for the following beef cattle production traits:

- **Birth Date** – The actual date an animal was born.
- **Birth Weight** – The weight of a calf taken at birth. Heavy births are associated with calving problems and sometimes death of the calf or cow (actual, ratio, or EPD). Birth weight EPDs are more reliable than actual birth weights when predicting calving problems.
- **Weaning Weight** – The weight of a calf taken between 160 and 250 days of age and then adjusted to a constant age of 205 days (actual, ratio, or EPD).
- **Yearling Weight** – The weight of an animal taken between 330 and 440 days of age and adjusted to a constant age of 365 days (actual, ratio, or EPD).
- **Hip Height or Frame Score** – Height at the hip in inches, or height at the hip in inches for a particular age (actual or ratio).
- **Maternal Milk EPD** – The difference in pounds of a calf expected at weaning because of differences in the milking and mothering ability of the cow.
- **Yearling Scrotal Circumference** – The distance measured in centimeters around the testicles in the scrotum of a bull at 365 days of age. A greater scrotal circumference indicates that a bull should have the capacity to produce greater volumes of semen, and his progeny should reach puberty at earlier ages (actual or ratio).

When presenting more than one type of data for a particular trait, such as ratios and EPDs for weaning weight, rank and use the data according to the accuracy with which future performance of offspring can be predicted. Give emphasis to the data in the following sequence:

1. EPD
2. Ratio within a contemporary group
3. An individual animal's actual records

Production Situations for Beef Cattle

The types of beef cattle data and the selection of livestock based solely on visual appraisal have been discussed previously. When practical, use additional information to aid in the selection process. The availability of actual data, ratios, and EPDs allows judges to compare animals using objective criteria of performance. However, without some guidelines, the justifications for various placings of a class with performance data may be even more numerous than the reasons based on visual appraisal alone.

Understanding the scenario is possibly the most important factor when placing a performance class. A scenario is the assumed situation you are in while ranking the class. In each scenario, address three important factors for a complete description:

• **Breeding Program**

- What type of breeding program is being used?
- How are the selected animals to be used in that program?
- What are the goals or objectives of this breeding program?

• **Feed and Labor Resources**

- Under what conditions are the animals being raised?
- Are feed resources readily available or limited?
- Are labor resources readily available or limited?

• **Marketing Program**

- How are the cattle marketed?
- At what age and/or weight are the cattle to be sold?
- For what type of buyer are the cattle being produced?

Using the three factors discussed above, analyze the following three scenarios and data:

Scenario 1: Angus Bulls

These bulls will be used as natural service sires in a two-breed rotational crossbreeding system with Hereford. Cows are medium mature weight and moderate for milk production, and they will be maintained similar to range conditions, with low labor and limited feed availability for larger sizes of cattle. The top 20 percent of heifer calves will be retained as replacements, and the remaining heifer and steer calves will be sold at weaning to be finished in a feedlot.

Table 2. Performance data for Angus bulls.

No.	Birth date	Birth weight EPD	Weaning weight EPD	Yearling weight EPD	Maternal milk EPD
1 (7028)	2/06/97	+2.1	+26.0	+35.0	+5.0
2 (7126)	2/25/97	+0.9	+33.0	+59.0	+11.0
3 (7003)	1/28/97	+5.3	+29.0	+38.0	-3.0
4 (7114)	2/24/97	+4.0	+28.0	+40.0	0.0
Breed Avg. EPDs:		+3.0	+29.1	+52.5	+11.5

Scenario 2: Simmental Heifers

These heifers will be used in a purebred Simmental herd that produces commercial bulls. The bulls will be used on Angus x Polled Hereford crossbred cows and heifers. Mature cow size in the commercial herd is 1,000 to 1,150 pounds. Feed and labor resources in this purebred Simmental herd are adequate to maintain a mature cow size of 1,300 to 1,500

pounds. The primary income is from the sale of commercial bulls, but some income is from the sale of a few purebred bulls and heifers to other purebred Simmental breeders.

Table 3. Performance data for Simmental heifers.

No.	Birth date	Birth weight EPD	205-day weight EPD	365-day weight EPD	Maternal milk EPD
1	1/30/94	+4.7	+24.2	+44.0	+1.5
2	3/01/94	+11.1	+42.7	+68.0	+11.0
3	1/22/94	+4.0	+28.0	+51.0	+1.0
4	2/11/94	+3.8	+24.0	+53.0	+0.8
Breed Avg. EPDs:		+3.3	+21.0	+33.8	+0.6

Scenario 3: Brangus Bulls

Rank these bulls in the order they should be selected as potential herd bulls for a commercial cattle operation. This progressive ranch is looking for a terminal sire to breed to 1,200-pound Black Baldie cows (Angus x Hereford). The progeny from these bulls will be retained by the ranch in the feedlot and sold on a value-based program using a grid that pays premiums for high cutability cattle. Feed and labor resources are abundant.

Table 4. Performance data for Brangus bulls.

No.	Tag	Birth weight EPD	Weaning weight EPD	Yearling weight EPD	Maternal milk EPD
1	604	+3.9	+18.2	+33.0	+4.0
2	666	+1.3	+9.8	+25.0	+5.4
3	699	-1.5	+19.2	+43.0	-1.0
4	714	+3.2	+28.5	+47.9	+1.8
Breed Avg. EPDs:		+1.3	+15.5	+27.1	+0.9

First, describe the **breeding program**. Is this a purebred or a commercial operation? If cattle are crossbred in this operation, what other breeds are being used? A class of heifers could be replacement females for a purebred program, or a class of bulls could be intended as natural service sires for a purebred or a commercial program. Regardless of the situation, outline an accurate and complete description of the breeding program. Following are analyses of scenario examples of possible breeding programs:

Angus Bulls – Use them as natural service sires in a two-breed rotational crossbreeding system with Hereford. Cows are medium for mature weight and moderate for milk production.

Simmental Heifers – Assume these heifers will be used in a purebred Simmental herd that produces commercial bulls. The bulls will be used on Angus x Polled Hereford crossbred

cows and heifers. Mature cow size in the commercial herd is 1,000 to 1,150 pounds.

Brangus Bulls – Use them as natural terminal service sires in a commercial operation with 1,200-pound Black Baldie cows (Angus x Hereford).

Second, discuss the **feed and labor resources**. Specifically, describe the quality and quantity of feed. For example, cattle that are managed on low-feed resources or range conditions need ample capacity to efficiently use the limited nutrients and probably should not have excessively high milk production. Labor resources will impact body type and birth weight performance records of cattle to be selected. Cattle with high birth weight, coarse shoulders, and narrow rump design with narrow pin placement typically require more physical-labor assistance in the calving process than cattle with low birth weight, smooth shoulders, and wide rump design with added width at the pins. Even with adequate labor available at calving, calves with high birth weights can create unwanted problems and economic hardships for cattle producers. Feed and labor resources are as follows:

Angus Bulls – Cows bred to these bulls will be maintained similar to range conditions, with low labor and limited feed availability for larger sizes of cattle.

Simmental Heifers – Feed and labor resources in this purebred Simmental herd are adequate to maintain a mature cow size of 1,300 to 1,500 pounds.

Brangus Bulls – Feed and labor resources are abundant.

Third, the scenario should discuss the **marketing program** in enough detail that performance traits and physical characteristics of the animals can be prioritized. Depending on the marketing program used, place emphasis on traits and characteristics that optimize production of beef cattle for the desired market. Examples follow of marketing programs from each scenario:

Angus Bulls – Retain the top 20 percent of heifer calves as replacements and sell the remaining heifer and steer calves at weaning to be finished in a feedlot.

Simmental Heifers – Sale of commercial bulls is the main benefit, but some income comes from the sale of a few purebred bulls and heifers to other purebred Simmental breeders.

Brangus Bulls – The ranch retains the progeny in the feedlot and sells on a value-based program using a grid that pays premiums for high cutability cattle.

After looking at each part of the scenarios, consider the following priorities:

Scenario 1

Priorities: Select bulls that will maintain mature weight and milk production (maternal traits—birth weight EPD and maternal milk EPD). Maternal traits are very important because top heifers are retained. Remaining heifers and steers are sold at weaning; therefore, paternal traits (weaning weight EPD) are very important.

Scenario 2

Priorities: Maintain a balanced program in all areas. Select cattle that maintain or slightly increase performance in maternal (birth weight EPD and maternal milk EPD) and paternal (weaning weight EPD and yearling weight EPD) traits. Extremes are faulted.

Scenario 3

Priorities: Select bulls that will produce fast-growing calves; therefore, paternal traits (yearling weight EPD) are very important. Maternal traits in this scenario are not really considered because of the abundance of labor and feed; however, extremes are faulted.

Sample Oral Reasons for Beef Cattle

Prepared by Jeremy White, former Union County 4-H'er

Junior Yearling Brangus Heifers: 3-4-2-1

"After analyzing this class of Brangus heifers, my placings were 3-4-2-1. I started with the split-eared heifer in the class, as she was the freest-moving and the longest, smoothest muscled, patterned heifer in the class. I realize 3 could have been heavier muscled throughout; nonetheless, I used 3 over 4 in my top pair, as 3 was a more moderate framed, smoother shouldered heifer that shows more femininity and refinement about her front. She was especially freer from excess leather in the dewlap and brisket and was cleaner and trimmer in the navel. 3 was the most progressive heifer in terms of her muscle length and smoothness, and she moved out with a freer, easier, and more ground-covering stride. She stood on more length of cannon and more closely follows that modern Brangus ideal. I must admit that 4 was a deeper ribbed heifer that showed more thickness down her top and through the center and lower portions of her quarter, while standing on more substance and diameter of bone. However, I would like to see 4 flatter and smoother in her muscle structure and more refined about her front end.

In spite of this, I preferred 4 over 2 in my middle pair, as 4 more closely followed my top heifer in terms of skeletal size and scale. Of the pair, 4 was a larger framed, deeper ribbed, wider sprung, higher capacity heifer that exhibited more total volume and capacity from end to end. She was a more ruggedly made heifer that showed more thickness of

muscling down her top and through all dimensions of her quarter. She stood on more substance of bone and more correctly on her feet and legs. I must admit that 2 did more closely follow my top heifer in terms of muscle length and smoothness and was more refined about her front end, but she splayed out up front and was cow hocked.

But I did prefer to use 2 over 1 in my bottom pair of smaller framed heifers, as 2 was a growthier heifer that was cleaner about her middle, trimmer about her front, and showed more youthfulness and growth potential about her head and neck. She was more progressive in her muscle length and smoothness and blended in neater and smoother through her shoulders. She appeared to be a later maturing heifer that should grow into a more progressive and productive herd matron. I must admit that 1 was a straighter, stronger topped, leveler rumped heifer that was more structurally correct, but I faulted 1 and placed her last in this class as she was the smallest framed, lowest set, heaviest fronted heifer that had the most leather in her dewlap, brisket, and navel. She lacked the overall size, scale, balance, and smoothness of the heifers placed above her in the class today. Thank you."

Limousin Heifers: 2-1-4-3

"Selecting the most production-oriented heifer that best combines volume, structural soundness, and balance, I chose the alignment 2-1-4-3 for the Limousin heifers. I realized 2 could be trimmer in her condition and wider tracking, but compared to 1 in my initial pair, she was a broody-appearing, easy-fleshing heifer that carried more length and spring from fore to rear ribs.

Sure, 1 was a stout-made, powerfully constructed heifer, but she was short bodied and restricted in her movement. However, with these faults aside, it was the muscle and volume of 1 over the balance of 4. Also, 1 was wider chested, being deeper and bolder sprung. Likewise, she carried more width and dimension down her top while maintaining this advantage into a more three-dimensional quarter.

Yes, 4 was a more feminine-fronted heifer, but at the same time, she was narrow tracking off both ends and tapered through her lower quarter. Even so, in my concluding pair, 4 beat 3. She was a more attractive profiling, more eye-appealing heifer that was more angular fronted. In addition, she was straighter, stronger down her top, and longer and leveler out of her hip, allowing her to be longer striding off her rear legs.

I realize 3 was a long-bodied, deep-sided heifer. However, this does not allow for the fact that she was the narrowest made, lightest muscled heifer that was the poorest structured; so she was last. Thank you."

Market Steers: 4-2-1-3

"My placing of the market steers is 4-2-1-3. I started the class with 4, the most powerfully muscled, most correctly finished steer in the class. I realize he was wastier fronted and middled; nonetheless, I used 4 over 2 in my top pair because he was a thicker made, heavier muscled steer throughout. He was a leveler topped steer that was longer in his rump. He had more thickness working down his top and out through a fuller rump. As viewed from behind, he had more thickness of muscle in the upper and center portions of his quarter and pushed more stifle on the move. He handled with more condition over his loin edge and down over his rib and should be more apt to reach that Choice quality grade. However, I do realize that 2 was a cleaner middled, trimmer fronted steer, but he simply lacked the volume and dimension of muscle of my top steer.

Concerning my middle pair, I placed 2 over 1, as 2 was a longer bodied, more upstanding steer that was trimmer through his front and middle. As viewed from behind, he had more thickness through the center and lower portions of his quarter and should go to the rail and hang a higher cutability carcass. I will admit that 1 was a deeper ribbed, wider sprung, higher capacity steer that stood down on more substance of bone. Also, he was a squarer rumped steer that was more ideal in the amount and uniformity of his finish.

I confidently placed 1 over 3 in my bottom pair, as he was a thicker made, heavier muscled steer that was more nearly ideal in his finish. He had more natural thickness down his top and through his quarter. He should hang a heavier muscled carcass that should be more likely to grade Choice. I do realize that 3 was a trimmer made steer, having less waste throughout. However, he was the lightest muscled, most underfinished steer of the class. He would hang up the least merchandizable carcass and, therefore, cannot merit a higher placing today. Thank you."

Performance Limousin Bulls: 1-4-2-3

"With the given scenario in mind, I placed my emphasis on weaning and yearling weight expected progeny differences as well as structural correctness and found that 1 best satisfied the scenario.

I realize 1 was not the highest in his growth data. Even so, the dehorned bull easily beats 4 in the top pair as he was the heaviest muscled, nicest balanced, easiest fleshing bull in the class. Plus, he's the deepest ribbed, the heaviest boned, and the straightest in his lines.

Yes, 4 had the highest weaning and yearling weight EPDs, but he was also the poorest structured bull that was straight in his shoulder and hock, was steep hipped, and was restricted in his movement, so he's second.

Still, I opted to use 4 over 2 in the middle pair, as 4 simply dominated in terms of weaning and yearling weight EPDs. In addition, he's a larger framed bull that was stronger topped, smoother shouldered, and cleaner fronted.

I admit 2 was leveler hipped and took a longer, freer stride from behind, but his weaning weight EPD of +6.9 was the lowest in the class; he's deep and course fronted, weak topped, and sickle hocked, so he's third.

Even so, I used 2 over 3 in the bottom pair as he's higher in his yearling weight EPD. He was thicker down his top and through his quarter, leveler hipped, and he tracked wider based behind.

I realize 3 was taller fronted, deeper ribbed, and straighter on his hind legs. But, at 9.7, he had the lowest yearling weight EPD of the class. He was the lightest muscled, narrowest chested, hardest doing bull that's steep hipped and twisted in his scrotum, so he's last. Thank you."

Sheep

Breeds of Sheep

Table 5 outlines some of the breeds of sheep that are common in the United States. Each breed has been assigned a breed class (ram, ewe, or dual) according to whether the dominant characteristics of the breed are associated with growth and carcass traits (ram) or reproductive characteristics (ewe). The dual breed class indicates that the breed is noted equally for growth, carcass, and reproductive characteristics.

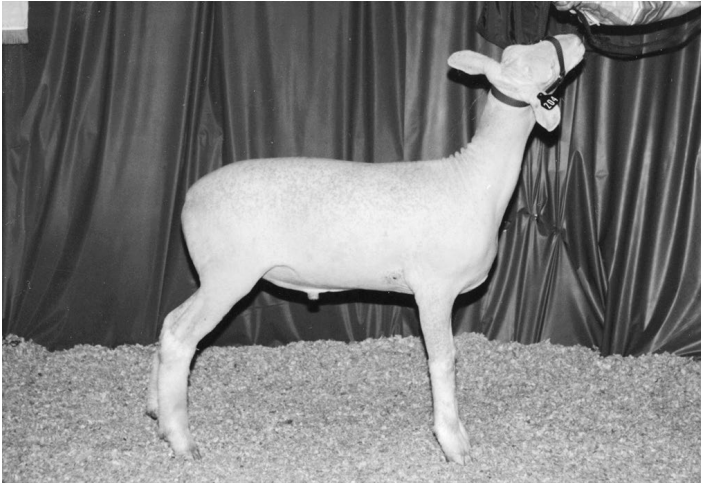


Average weights for mature rams and ewes are listed. Again, these are included to allow you to compare one breed with another breed. The weights and other characteristics listed are breed averages; there is as much variation within a breed as there is among breeds for these traits.

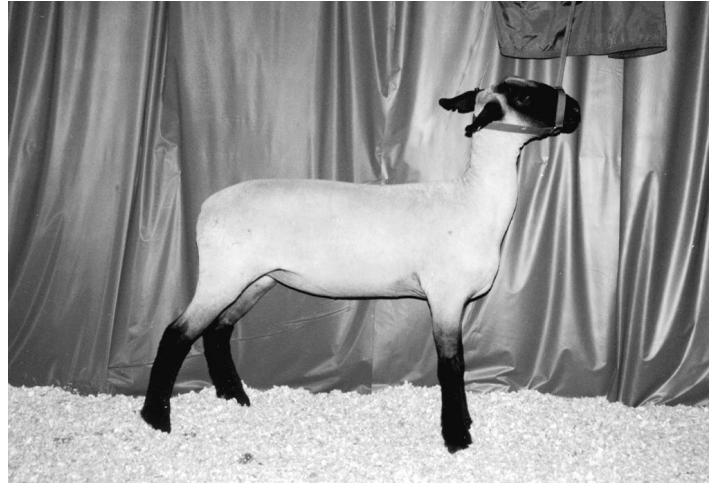
Growth rate, hardiness, gregariousness, prolificacy, and milking ability are ranked among breeds, using a 6-point scale, with 1 as the most desirable and 6 as the least desirable. Fleece weight is given in pounds of wool per year from the average animal of that breed. Fleece type is listed as either fine, medium, or long and describes the type of wool fiber characteristic of the breed.

Table 5. Breeds of sheep. Growth rate, hardiness, gregariousness, prolificacy, and milking ability ranking based on 1 (most desirable) through 6 (least desirable). Adapted from *The Sheepman's Production Handbook*, 1982, George E. Scott, editor.

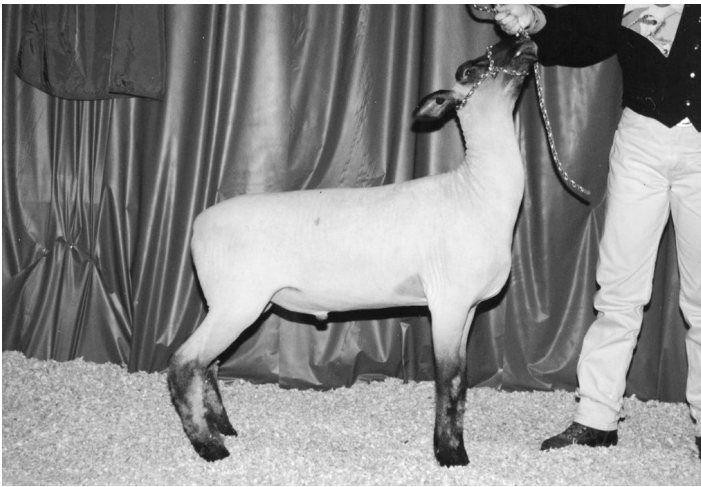
Breed	Breed class	Ram weight	Ewe weight	Growth rate	Hardiness	Gregariousness	Prolificacy	Milking ability	Fleece weight	Wool type	Face color
Border Leicester	ram	210	160	4	6	6	3	3	9	long	white
Cheviot	ewe	180	135	4	4	6	4	4	5	medium	white
Columbia	dual	260	165	2	4	4	4	4	11	medium	white
Corriedale	ewe	190	140	5	4	4	4	4	11	medium	white
Debouillet	ewe	190	140	5	2	2	5	5	11	fine	white
Delaine	ewe	195	130	5	2	2	5	5	11	fine	white
Dorset	dual	225	170	3	6	6	3	2	6	medium	white
Finnsheep	ewe	200	140	5	6	6	1	2	6	medium	white
Hampshire	ram	275	200	2	6	6	3	2	7	medium	black
Lincoln	dual	300	225	5	6	6	4	5	12	long	white
Montdale	ram	235	160	4	5	6	4	4	8	medium	white
Oxford	ram	250	190	3	6	6	4	4	8	medium	brown
Rambouillet	ewe	225	160	3	2	2	5	5	11	fine	white
Romney	dual	220	175	5	6	6	4	5	10	long	white
Shropshire	ram	235	170	3	5	6	3	3	8	medium	dark brown
Southdown	ram	200	145	4	6	6	4	4	5	medium	light brown
Suffolk	ram	300	215	1	6	6	2	2	5	medium	black
Targhee	ewe	250	175	3	4	4	4	4	11	medium	white



Dorset



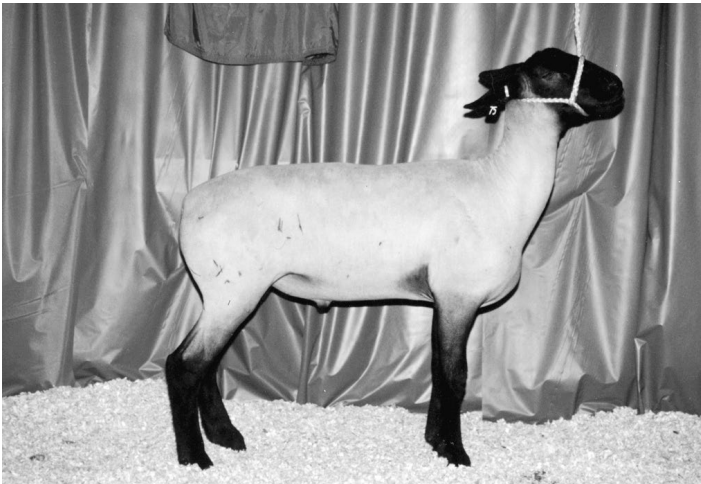
Hampshire



Oxford



Shropshire



Suffolk

Parts of Sheep

Become familiar with the parts and carcass regions of sheep. In this section, you are provided diagrams of the external parts of sheep (Figure 11), characteristics of an ideal breeding ewe (Figure 12), and characteristics of an ideal market wether (Figure 13). After becoming familiar with all the parts, use those terms as part of your reasons.

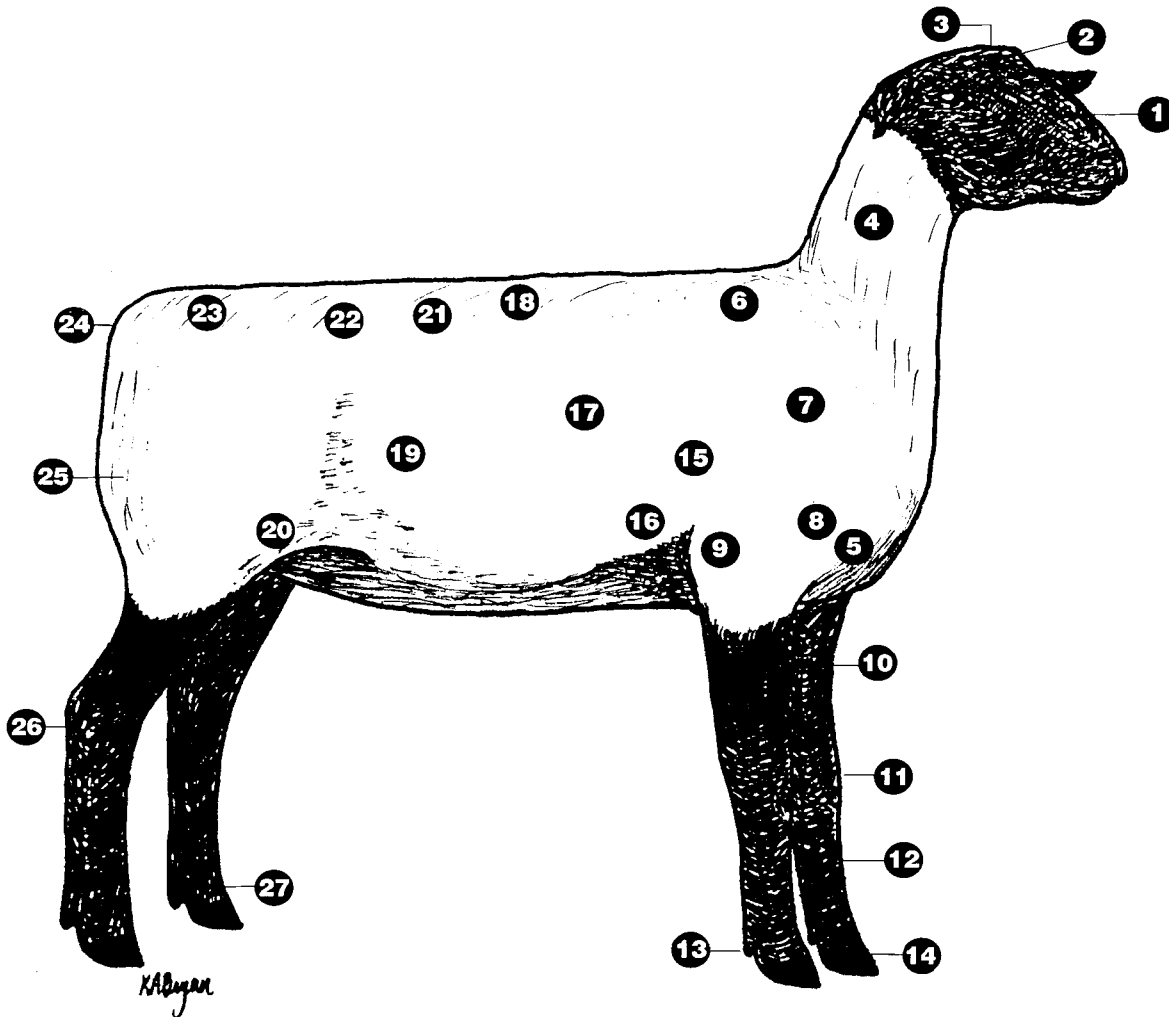


Figure 11. External parts.

- | | | |
|----------------------|-------------------|----------------|
| 1. face | 10. forearm | 19. middle |
| 2. forehead | 11. knee | 20. rear flank |
| 3. poll | 12. cannon | 21. loin |
| 4. neck | 13. dewclaw | 22. hip |
| 5. breast | 14. foot | 23. rump |
| 6. top of shoulder | 15. forerib | 24. dock |
| 7. shoulder | 16. lower forerib | 25. leg |
| 8. point of shoulder | 17. rib | 26. hock |
| 9. elbow | 18. back or top | 27. pastern |

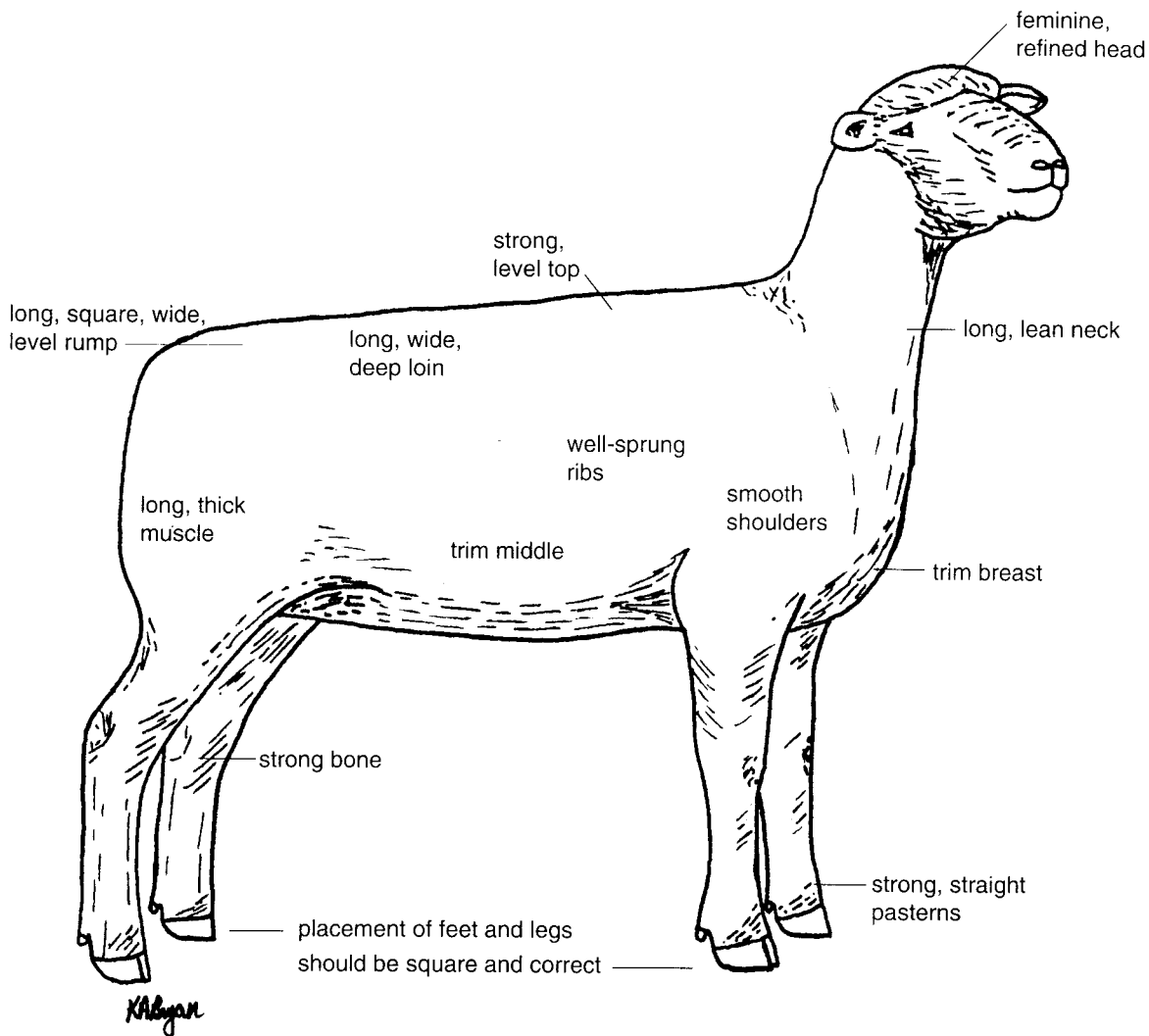


Figure 12. Characteristics of an ideal breeding ewe.

- feminine, refined head
- long, lean neck
- trim breast
- smooth shoulders
- well-sprung ribs
- trim middle
- strong, level top
- long, wide, deep loin
- long, square, wide, level rump
- long, thick muscle
- strong bone
- placement of feet and legs square and correct
- strong, straight pasterns

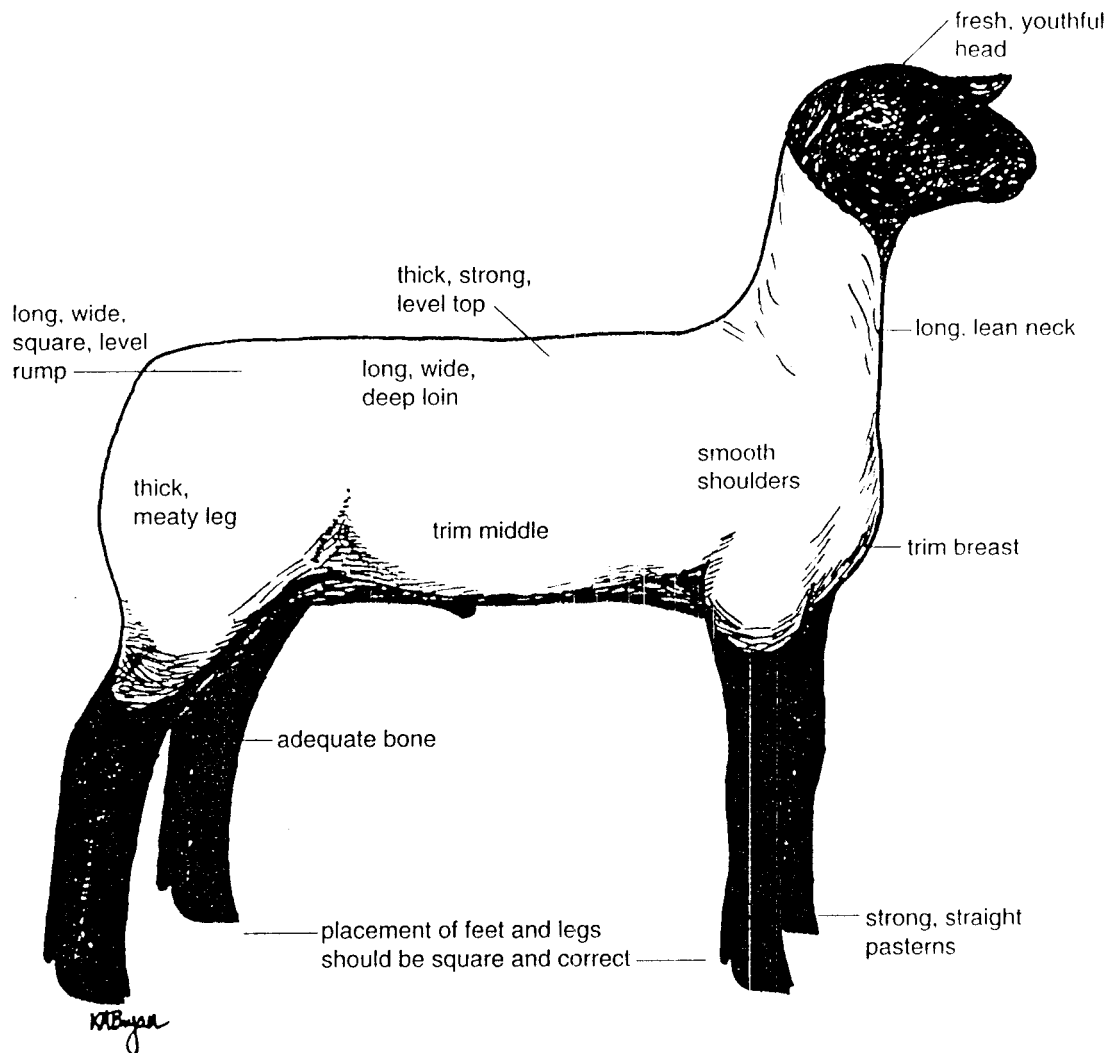


Figure 13. Characteristics of an ideal market wether.

- fresh, youthful head
- long, lean neck
- trim breast
- smooth shoulders
- trim middle
- thick, strong, level top
- long, wide, deep loin
- long, wide, square, level rump
- thick, meaty leg
- adequate bone
- placement of feet and legs square and correct
- strong, straight pasterns

Market wether characteristic	Average	Ideal
Live weight (lb)	110.0	120.0
Dressing percentage	52.0	52.0
Fat thickness (in)	0.30	0.12
Ribeye area (sq in)	2.25	2.80
KP fat percent	3.5	2.0

Adapted from *Live Animal Carcass Evaluation and Selection Manual*, 4th edition, 1993, Donald L. Boggs and Robert A. Merkel.

Handling Market Lambs

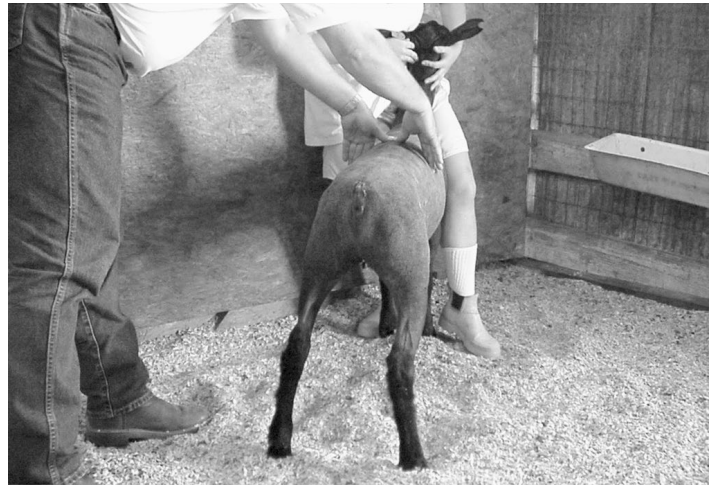
One key to handling market lambs is to develop a system to accurately determine differences in muscle and finish. Handle each lamb in the same manner. If you handle one lamb from rear to front for finish or fleshing on the back, handle all the lambs that way. Following are the steps for handling market lambs:



Step 1. The way the sheep stands affects what you are able to feel. Stand the sheep squarely on all four feet while it is being handled.



Step 2. With your fingers extended and together, check the width and the smoothness of the top of its shoulders.



Step 3. Handle the topline of the lamb for finish and muscle. Begin by evaluating the width, spread of muscle, and firmness of finish directly behind the shoulders.



Step 4. Continue down the topline of the lamb. End by evaluating the width and the depth of the loin and the width of the rump.



Step 5. Next, check for finish over the rib of the lamb by starting in its lower forerib.



Step 6. Continue handling toward the last rib of the lamb.

Step 7. The final location used to determine the finish of a lamb is at the last rib. Lambs should feel trimmer at the last rib compared with the forerib. Trim, muscular lambs are firm and hard when handled. Fat lambs are soft to the touch, and it is difficult to distinguish the bones of the shoulder, spine, and ribs.



Step 9. Next, handle the lamb for width and length of the rump.



Step 8. To handle for length of loin, place your fingertips at the last rib and determine where the lamb's hocks fall on your hand or forearm. The three dimensions—width, depth, and length—contribute to the total volume of muscle in the loin, which is one of the more valuable cuts.



Step 10. Grasp the leg firmly at the stifle region to determine the size of the leg and the amount and firmness of inside and outside muscling. Use both hands as in the picture to press firmly, with the fingers meeting on the inside. Older youth and adults may use only one hand to determine the size of the leg. The leg should be firm and heavily muscled, and the muscle should extend toward the hock.

Sheep Terminology

General

More Desirable Characteristics	Less Desirable Characteristics
more progressive	conventional
more dimensional	—
more dimensional	—
stouter	needed more size and performance
more upstanding	low fronted
growthier	lacked growth and do-ability

Structure

More Desirable Characteristics	Less Desirable Characteristics
more fault free	ill structured
more problem free	poorer structured
straighter lined	slack framed
more structurally correct	structurally incorrect, poorer structured
nicer balanced	off balance
tighter framed	slack framed
stronger topped, loined	weak topped, weaker loined
squarer, leveler rumped	dropped at the dock
more nearly level in (his/her) rump	steeper in (his/her) rump

Frame and Growth

More Desirable Characteristics	Less Desirable Characteristics
larger framed	smaller framed
more size and scale	lacked size and scale
longer _____	shorter _____
more ruggedly designed	finer boned
higher weight per day of age	lower weight per day of age
more performance oriented	lacked growth and performance

Head, Neck, and Shoulder

More Desirable Characteristics	Less Desirable Characteristics
fresher appearing	staler appearing
later maturing	earlier maturing
more future growth potential	less future growth potential
more extended through the front end	shorter fronted
longer, leaner neck	shorter, more pety in (his/her) neck
laid in more neatly about the shoulder	coarser fronted
smoother, tighter shouldered	more open shouldered
smoother neck/shoulder junction	coarser neck/shoulder junction
more desirable slope to (his/her) shoulder	straighter shouldered

Condition

More Desirable Characteristics	Less Desirable Characteristics
trimmer, cleaner patterned	—
cleaner conditioned	heavier condition
more ideal in (his/her) condition	—
trimmer breasted	wastier through (his/her) breast
easier fleshing	harder fleshing, harder doing

Volume and Capacity

More Desirable Characteristics	Less Desirable Characteristics
wider sprung	narrower made
deeper _____	shallower _____
higher capacity	shallower bodied, tighter ribbed
more capacious	less capacious
more internal volume	less internal volume
more dimensional _____	less dimensional _____
more arch and spring of rib	flatter ribbed
bolder spring of rib	pinched or constricted in the forerib
more dimension through the center of the rib	less dimension through the center of the rib

Muscle

More Desirable Characteristics	Less Desirable Characteristics
longer, smoother muscle design	shorter, tighter muscle design
_____ muscle make-up	—
heavier muscled	lighter muscled
thicker made	—
more expressively muscled in (his/her) leg	lighter muscled in (his/her) leg

Feet and Legs

More Desirable Characteristics	Less Desirable Characteristics
stood on more bone	stood on finer bone
heavier boned	finer boned
stood on more rugged bone	stood on finer bone
stood squarer in (his/her) foot placement	splayfooted, pigeon-toed, toes out
stood wider both front and rear	stood narrower both front and rear
more desirable set to the hock	posty legged, sickle hocked
stronger pasterns	weaker pasterns

Stride and Movement

More Desirable Characteristics	Less Desirable Characteristics
more mobile	restricted in (his/her) movement
more fluid moving	stiffer strided
easier moving, sounder footed	restricted in (his/her) movement
moved out freer and easier	shorter strided
farther reaching in (his/her) stride	shorter strided
truer tracking	narrower tracking, cow hocked
longer strided	shorter strided
moved with more strength of top	roached (his/her) top on the move
moved with more levelness of rump	dropped (his/her) dock on the move

Fleece

More Desirable Characteristics	Less Desirable Characteristics
freer from black fiber	possessed black fiber _____
tighter, denser fleece	pencil fleece, more open fleece
fleece with finer crimp	cottony fleece

Ram

More Desirable Characteristics	Less Desirable Characteristics
greater scrotal circumference	smaller scrotal circumference
“buck”	—
more potential to sire lambs with [frame, length, volume, balance, growth, muscle, trimness, performance, weight per day of age]	less potential to sire lambs with [frame, length, —, —, growth, muscle, —, performance, weight per day of age]
should sire lambs with more [frame, length, volume, balance, growth, muscle, trimness, performance, weight per day of age]	should sire lambs with less [frame, length, —, —, growth, muscle, —, performance, weight per day of age]

Ewe

More Desirable Characteristics	Less Desirable Characteristics
broodier	—
brood ewe prospect	—
more feminine	coarser fronted
more stylish	—
more capacious	less capacious

Wether

More Desirable Characteristics	Less Desirable Characteristics
muscle and trimness	—
trimmer, cleaner patterned	—
trimmer fronted	wastier fronted, pelty
cleaner, harder handling	overfinished, fatter, wastier
firmer handling	softer handling
handled with _____	—
heavier muscled	lighter muscled
more dimensional leg	narrower, lighter muscled leg
wider, fuller rump	narrower rump, pinched at (his/her) dock
heavier muscled hindsaddle	lighter muscled hindsaddle
should hang a carcass with _____	—
should rail a _____ carcass	—
trimmer, higher cutability carcass	—
carcass with more leg muscle	—

Performance Data for Sheep

Much like performance data for beef cattle, performance data for sheep can be listed in several different ways. Both actual data and ratios are used to select animals that are superior for lamb and wool production. Performance data are important for selecting replacement animals and culling poor-producing animals.

In judging classes, stud rams or ewes in production are typically not evaluated. Therefore, the use of performance data for selecting replacement ewes and potential stud rams is of primary concern.

Familiarize yourself with the following sheep production traits and the associated terms in order to understand performance data for sheep:

- **Birth Date** – Actual date an animal was born.
- **Birth Weight** – The weight of a lamb taken within 24 hours after birth. Heavy birth weights are associated with lambing problems (actual, ratio).
- **Type of Birth and Type of Rearing** – The number of lambs born and raised by a ewe. The following designations are used: S-single, TW-twin, TR-triplet, and Q-quadruplet (Examples: Type of birth-TW, Type of rearing-S).
- **Prewaning and Postweaning Weights** – Considerable variation exists among sheep producers for age at weaning. Because all performance records for sheep are to be evaluated within a flock, preweaning and postweaning weights will be listed according to management procedures for a particular flock.
- **Age-Weight Categories** – The weight of a lamb adjusted to a particular age (actual, ratio, EPD). Standard age-weight categories for sheep according to National Sheep Improvement Program (NSIP) guidelines are as follows:
 - **Weaning Weight** – A specified weaning weight will be given for one of the age-weight categories in the following table. Usually, weaning weight corresponds with 30-, 60-, 90-, or 120-day weight (actual, ratio, EPD).
 - **Yearling Weight** – The weight of a sheep taken after 335 days of age and before 395 days of age and adjusted to a constant age of 365 days (actual, ratio, EPD).
 - **Fleece Quantity and Quality** – Wool measurements on an animal are taken only once in its lifetime and should be measured at approximately 1 year of age. Wool measurements include the following:
 - ♦ **Grease Weight** – Weight of the freshly shorn fleece in pounds to the nearest tenth of a pound.
 - ♦ **Clean Weight** – Weight of the cleaned fleece in pounds to the nearest tenth of a pound, as determined by a wool testing laboratory.

- ♦ **Staple Length** – Length of the unstretched wool fibers in inches to the nearest tenth of an inch, obtained from the midside area of the animal.
- ♦ **Grade** – Fleece grade is recorded to the nearest tenth of a micron (1 micron = 1/25,400 inch).

Expected Progeny Differences (EPDs) for Sheep

In the past, data were calculated only as FEPDs, which is the same as EPDs except that all the data were derived from a single flock. The “F” stands for “flock.” However, FEPDs do not use across-flock data.

FEPDs were used for several years because across-flock analyses for sheep were not feasible. There was not enough reliable information on identifiable genetic linkages between flocks. Today, however, across-flock EPDs provide far more information about genetic value than FEPDs because they are derived from many flocks and over different management systems.

By using EPDs, a breeder can make genetic improvements efficiently and reliably. EPDs allow a breeder to rank all the animals by genetic value, identify high-producing replacements, and cull poor-producing animals.

EPDs for sheep are developed primarily for these economically important traits:

Maternal EPDs

Number of Lambs Born – A positive EPD indicates the ewe has the capability to produce more lambs than a ewe with a (zero) or negative EPD for this trait. This EPD is an indicator of prolificacy, or the genetic ability of the ewe to produce lambs.

Maternal Milk – This trait refers to the difference in pounds of a lamb/lambs expected at weaning because of differences in milking and mothering ability of the ewe. An EPD of +6.0 means the ewe should wean lambs that are 6 pounds heavier at weaning than lambs produced by a ewe with an EPD of 0.

Growth EPDs

Weights at Prewaning, Weaning, and Postweaning – These EPDs correspond to the age-weight categories of 60-, 90-, 120-, 180-, and 365-day weights in lambs and are used to evaluate the genetic merit for growth.

In each instance, the age should be listed also. These EPDs are very similar to and should be interpreted much like the EPDs for other age-weight listings (Example: 205-day weight in beef cattle).

Wool EPDs

Wool EPDs are calculated for grease fleece weight, fiber length, and fiber diameter.

Age-Weight Category	Allowable Range in Age
30-day	23 to 37 days
60-day	38 to 83 days
90-day	68 to 113 days
120-day	98 to 143 days
180-day	150 to 210 days
365-day	335 to 395 days

Production Situations for Sheep

As in the beef cattle section, three classes of sheep with performance data are included as examples of different scenarios and ways of presenting performance data. Also, the priorities of each are listed.

Scenario 1: Suffolk Ram Lambs

Rank these rams as you would use them for stud rams in a purebred Suffolk flock. Feed and labor resources are more than adequate to maintain the flock of ewes. You profit mainly from selling rams and ewes to other purebred Suffolk breeders, and a few rams to commercial sheep producers. You retain your own replacement ewes.

Table 6. Performance data for Suffolk ram lambs.

No.	Birth type	Birth rearing	Birth weight	Lambs born	Maternal milk	60-day weight	365-day weight	Dam's fleece weight
1	TW	TW	9.3	-.042	+4.1	+1.2	+3.2	-0.1
2	S	S	12.0	+.041	+6.1	+3.1	+9.7	+0.4
3	TW	S	10.2	+.036	+5.0	+2.0	+10.3	+0.2
4	TR	TW	9.6	-.022	+3.7	+1.3	+5.3	+0.1

Scenario 2: Dorset Fall Ewe Lambs

Rank these ewes as you would use them as replacement ewes in a purebred flock of Dorset sheep. You sell a few rams to other purebred Dorset breeders, but you mainly profit from the sale of rams and ewes to commercial sheep operations.

Table 7. Performance data for Dorset fall ewe lambs.

No.	Birth date	Birth type	Rearing type	Birth weight	Weight	Ratio	Weight	Ratio	Dam's fleece weight
1	9/5	S	S	12.0	61	91	120	97	8.6
2	9/7	TW	TW	7.5	66	99	123	99	7.5
3	9/20	TW	TW	8.5	72	108	130	105	10.4
4	9/22	TR	TR	10.5	76	114	136	109	9.5

Scenario 3: Yearling Hampshire Rams

Assume these rams are terminal sires to be used on Rambouillet x Dorset crossbred ewes for production of feeder lambs. All lambs are finished in a feedlot on the farm. Ewes are maintained on range conditions, typical of sheep production operations in the Rocky Mountain states.

Table 8. Performance data for yearling Hampshire rams.

No.	Birth date	Birth type	Rearing type	Birth weight	Lambs born	30-day weight	120-day weight	180-day weight
1	2/5	S	S	12.3	-.010	+2.6	+5.2	+8.2
2	2/7	S	S	14.0	+.060	+1.9	+3.2	+4.4
3	2/20	TW	S	10.2	+.210	-1.6	-2.2	-8.2
4	2/22	TR	TR	9.6	+.122	+1.1	+4.4	+9.7

After looking at the three scenarios, consider the following priorities:

Scenario 1

Priorities: Balanced program in all areas. Select rams that maintain or slightly increase maternal and growth traits, but extremes ones are to be faulted.

Scenario 2

Priorities: Again, this is a balanced program; however, more emphasis should be placed on growth traits because rams and ewes are sold to commercial operations.

Scenario 3

Priorities: Select rams that will improve the growth traits. Growth is very important because all lambs are finished in a feedlot.

Sample Oral Reasons for Sheep

Dorset Ewes: 3-2-1-4

"My placing of the Dorset ewes was 3-2-1-4. I found a top pair of more modern-type ewes and started the class with the combination ewe in 3. Ideally, I would have liked to see 3 with more capacity in the forerib. Even so, I placed 3 over 2 as she was a leveler-topped, leveler-rumped ewe that was more progressive in her type and muscle makeup. She was a stretchier ewe that put a longer, smoother muscle structure onto a longer skeletal framework, and she was taller. She was a cleaner fronted, more feminine-headed female. However, I concede that 2 had more arch and spring to her forerib.

Nevertheless, I placed 2 over 1 in my middle pair, as 2 more closely followed the type and pattern set by my top ewe. She was a more feminine-fronted ewe that was laid in tighter about her shoulder, was longer and leaner about her neck, and exhibited more femininity about her head. She was a longer bodied ewe that was higher at her dock and had a more desirable set to her hock. I will admit that 1 was a thicker made ewe, although she was weaker on her rear pasterns.

With this in mind, it was 1 over 4 in my final comparisons. 1 was a longer bodied, larger framed ewe that had more natural thickness of muscle and more total volume and capacity. She was a longer bodied ewe that was trimmer in her breeding condition. However, I realize that 4 was a smoother shouldered ewe, but she was the smallest framed, shortest bodied ewe that was the most conventional in her type. Thank you."

Market Lambs: 1-2-3-4

"My placing of the market lambs was 1-2-3-4. I started with 1, the growthiest, most correctly finished lamb in the class. Ideally, I would have liked to see 1 with more muscling throughout. Nonetheless, I placed 1 over 2 as he was a trimmer made lamb that was cleaner and neater about his front end. He handled with less finish over his rib and was a larger framed, longer bodied lamb. He should go to the rail and hang a trimmer, higher cutability carcass. I realize that 2 was a heavier muscled lamb that had more dimension of muscle in his loin, over his rump, and down through his leg, but he was a softer handling, heavier finished lamb.

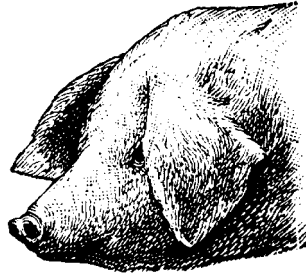
Nevertheless, I placed 2 over 3 in my middle comparison because 2 was a larger framed, taller fronted lamb that handled with a longer hindsaddle. He was a heavier muscled lamb that was leveler and fuller through his rump. He was a more structurally correct wether that should go to the rail and hang up a heavier muscled carcass. I admit that 3 was the most correctly finished lamb in the class, but he simply lacked the growth, scale, and total muscle volume of the two lambs placed above him.

Still, I opted to use 3 over 4 because 3 was more correctly finished than 4. He was a firmer handling lamb that had more dimension and expression of muscle in his leg. He should rail a trimmer finished carcass with more total pounds of muscle. Yes, 4 was a larger framed lamb, but he was a wastier, heavier conditioned, and lighter muscled lamb that should hang up the least profitable carcass in the class. Thank you."

Swine

Breeds of Swine

The following table compares characteristics of the breeds of swine that are common in the United States.



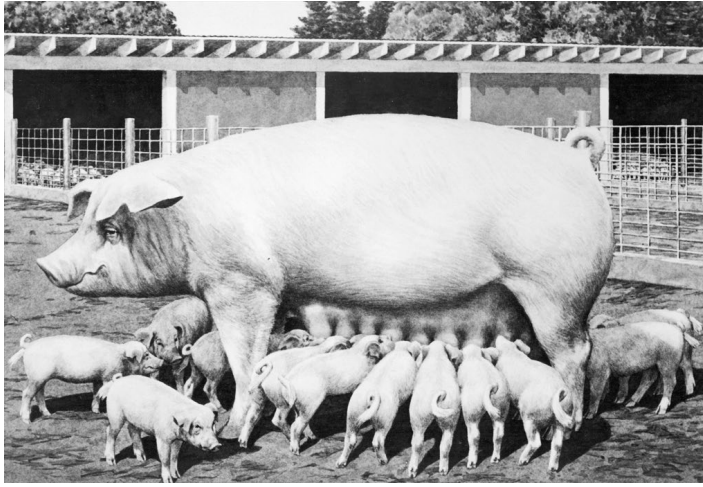
A 5-point scale is used, with 1 and 2 representing a breed that is above average for a particular trait, 3 is average for the trait, and 4 and 5 are below average for the trait.

Litter size and litter weight are characteristics associated with reproductive performance of females in the herd. Growth rate and feed efficiency are traits related to an animal's ability to grow rapidly and convert feed to body weight. Backfat thickness and loin eye area describe the relative merits of market animals to yield muscular, trim carcasses.

The ear set of swine is either erect or down. That ear characteristic will help you distinguish some breeds from others.

Table 9. Breeds of swine. Litter weight, growth rate, backfat thickness, loin muscle area, and ear set ranking based on 1 (most desirable) through 5 (least desirable). Insufficient data for comparison is indicated by (—). Adapted from the Pork Industry Handbook, 1985 Purdue University Cooperative Extension Service.

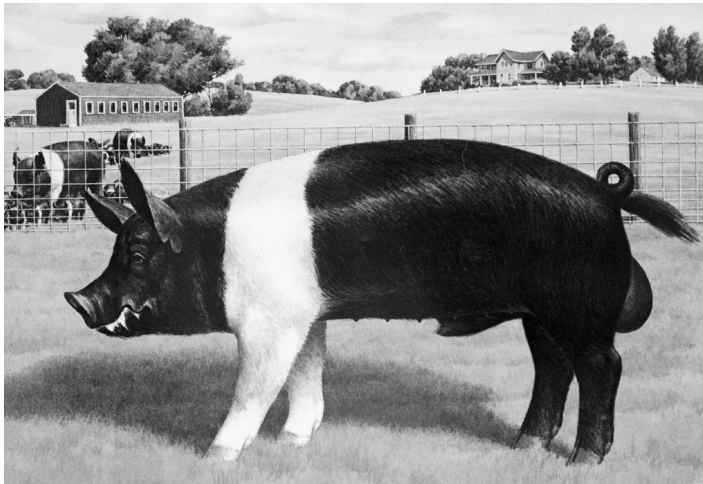
Breed	Litter Size	Litter Weight	Growth Rate	Backfat Thickness	Loin Muscle Area	Ear Set	Characteristics
Berkshire	4	4	—	3	3	erect	black with white on face, legs, possibly the switch
Chester White	1	4	5	3	3	down	solid white
Duroc	3	3	2	3	3	down	solid red, from bright orange to chocolate-red
Hampshire	4	3	4	1	2	erect	black with white belt across the front legs
Landrace	1	1	3	5	4	down	solid white
Poland China	—	—	3	2	2	down	black with white face, legs, possibly the switch
Spotted	5	4	2	4	2	down	white with black spots
Yorkshire	1	2	2	4	3	erect	solid white



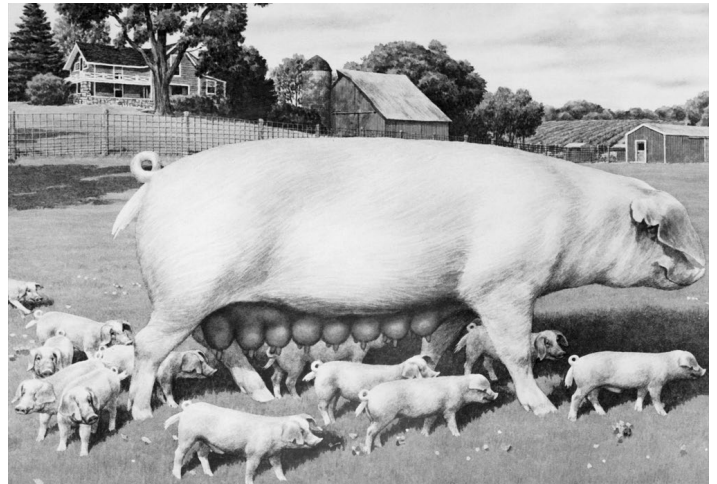
Chester White



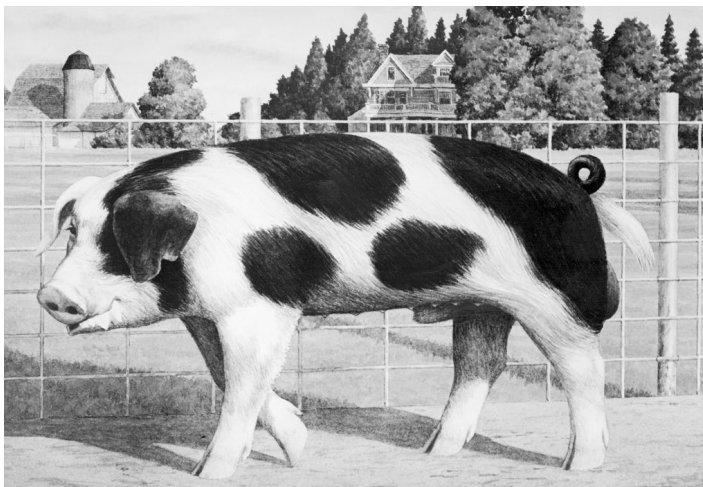
Duroc



Hampshire



Landrace



Spot



Yorkshire

Photos provided by the National Pork Board.

Parts of Swine

After you have become familiar with the breeds of swine, learn the external parts and carcass regions. This section provides diagrams of the external parts (Figure 14), characteristics of an ideal breeding gilt (Figure 15), and characteristics of an ideal market barrow (Figure 16). Take time to study all of the parts and to become familiar with

them so you can refer to them without hesitation. Use these terms as part of your reasons.

Characteristics of the ideal breeding gilt and the ideal market barrow are included for reference only. Depending on the location and production situation, an ideal can take on various shapes and forms.

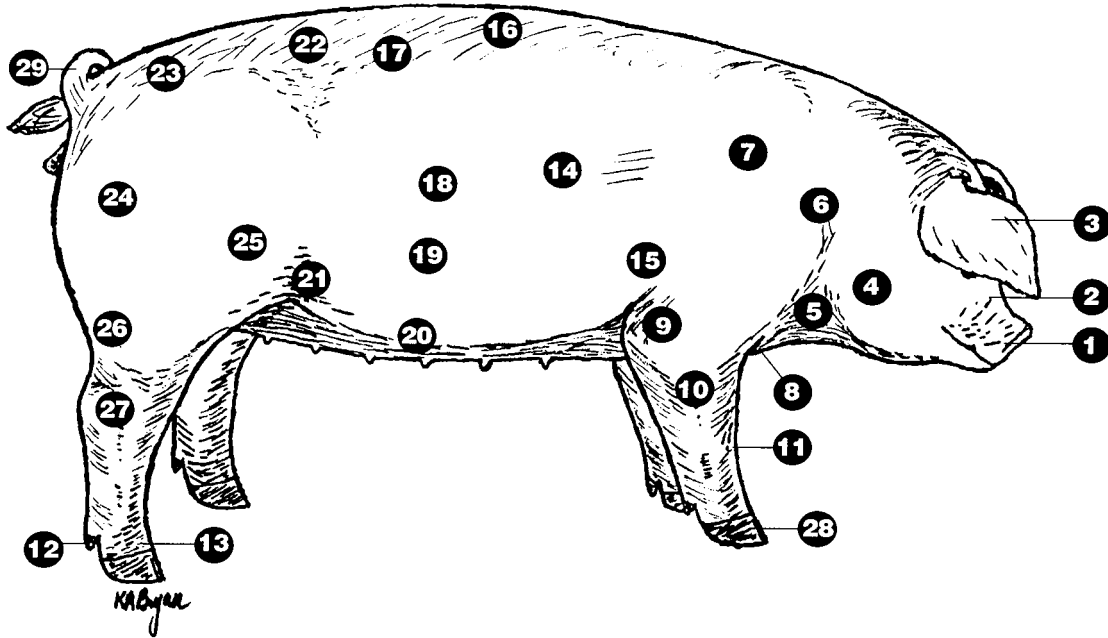


Figure 14. External parts.

- | | | |
|----------------------|--------------------|-----------------------|
| 1. snout | 11. knee | 21. rear flank |
| 2. face | 12. dewclaw | 22. ham-loin junction |
| 3. ear | 13. pastern | 23. rump |
| 4. jaw | 14. rib | 24. ham |
| 5. jowl | 15. forerib | 25. stifle |
| 6. neck | 16. top or topline | 26. base of ham |
| 7. shoulder or blade | 17. loin | 27. hock |
| 8. chest | 18. side | 28. foot or toes |
| 9. elbow | 19. middle | 29. tail |
| 10. forearm | 20. underline | |

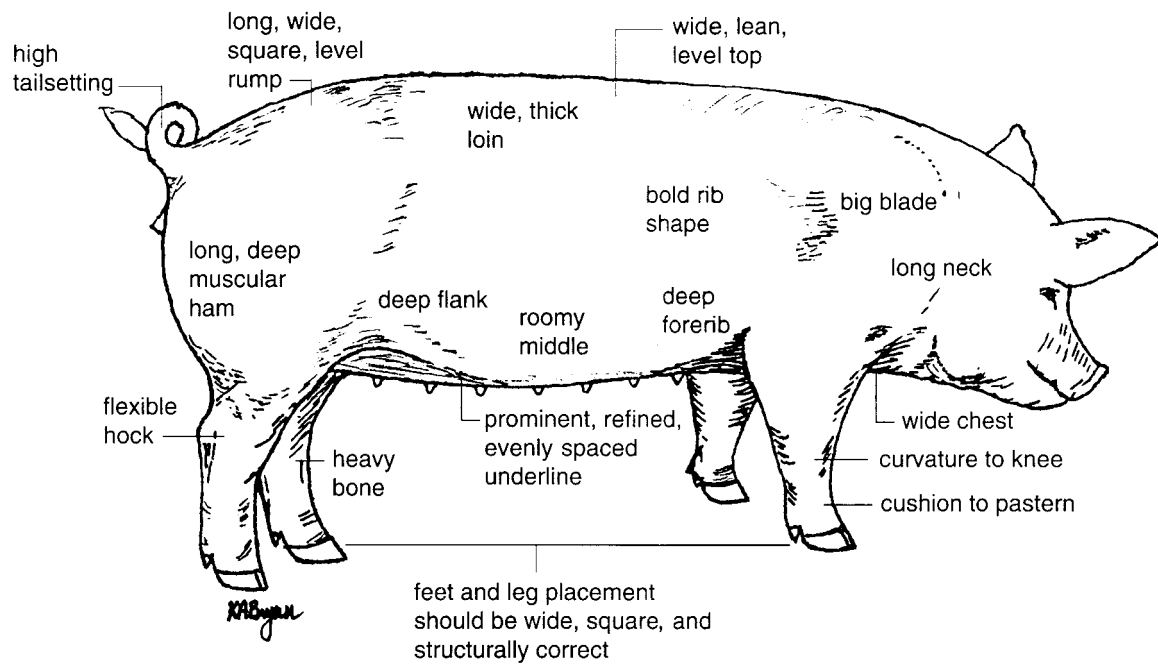


Figure 15. Characteristics of an ideal breeding gilt.

- long neck
- wide chest
- big blade
- wide, lean, level top
- bold rib shape
- deep forerib
- roomy middle
- wide, thick loin
- deep flank
- long, wide, square, level rump
- high tail setting
- long, deep, muscular ham
- flexible hock
- heavy bone
- prominent, refined, evenly spaced underline
- feet and leg placement wide, square, and structurally correct
- curvature to knee
- cushion to pastern

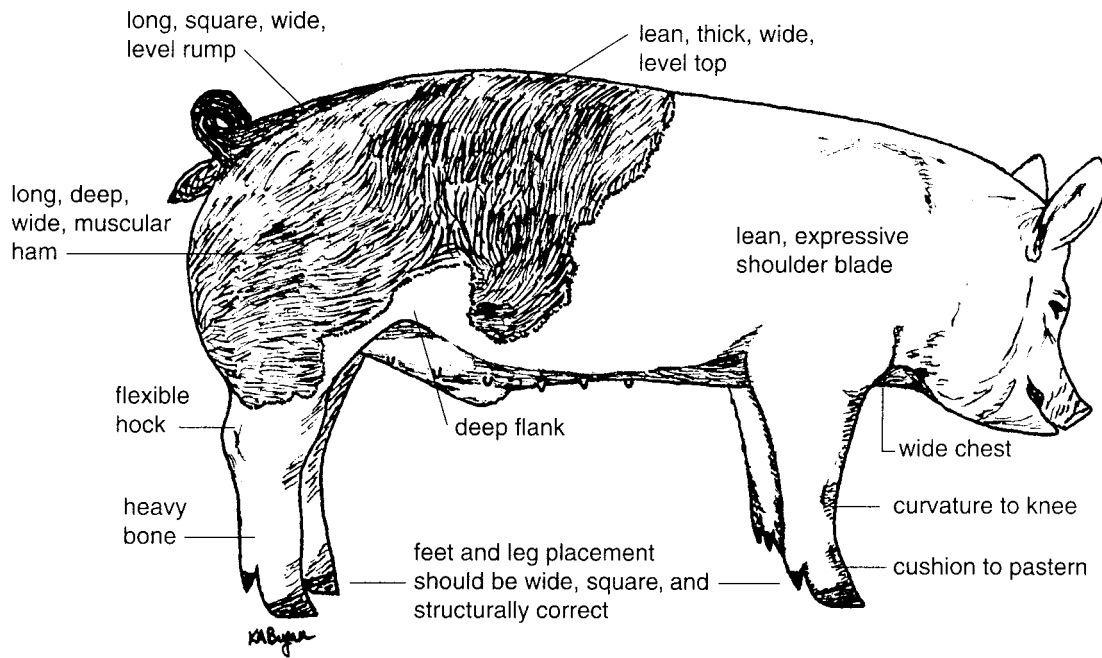


Figure 16. Characteristics of an ideal market barrow.

- wide chest
- lean, expressive shoulder blade
- lean, thick, wide, level top
- deep flank
- long, square, wide, level rump
- long, deep, wide, muscular ham
- flexible hock
- heavy bone
- feet and leg placement wide, square, and structurally correct
- curvature to knee
- cushion to pastern

Market barrow characteristic	Normal range	Average	Ideal
Live weight (lb)	210–270	245.0	245.0
Dressing percentage	68–77	72.0	75.0
Average backfat (in)	0.7–2.0	1.5	1.0
Carcass length (in)	28–34	30.5	32.0
Loineye area (sq in)	3.0–7.0	4.5	5.8
Percent muscle	45–65	51.0	54.0

Adapted from *Live Animal Carcass Evaluation and Selection Manual*, 4th edition, 1993, Donald L. Boggs and Robert A. Merkel.

Swine Terminology

General

More Desirable Characteristics	Less Desirable Characteristics
growthier	—
more performance oriented	—
faster growing	slower growing
higher performing	lower performing, poorer performing
more functional	—
more problem free	—
more complete	—
more fault free	—
larger outlined	smaller outlined
larger scale	smaller scale
longer sided	shorter sided
nicer balanced	more off balance
more desirable composition of gain	less desirable composition

Durability and Bone

More Desirable Characteristics	Less Desirable Characteristics
more durable	frailer
heavier boned	finer boned
stood on more substance of bone	stood on finer bone
more ruggedly designed	—
bolder fronted	narrow fronted
bolder sprung	—
stood on greater substance of bone	frailer
greater diameter of bone	finer boned

Structure and Movement

More Desirable Characteristics	Less Desirable Characteristics
more confinement adaptable	less confinement adaptable
looser _____	tighter _____
looser in (his/her) skeleton	tighter in (his/her) skeleton
sounder	poorer structured
sounder designed	tighter structured
leveler topped	higher topped
leveler rump	steeper rump
leveler in (his/her) rump design	steeper in (his/her) rump design
more curvature to (his/her) knee	buck-kneed, straighter through (his/her) knee
more even in (his/her) toe length	more uneven in (his/her) toe length
more desirable slope to (his/her) shoulder	straighter in (his/her) shoulder
more flex of hock	straighter in (his/her) hock
more animation to (his/her) hock	posty legged
more cushion to (his/her) pasterns	straighter in (his/her) pasterns
looser strided	more tightly wound
freer strided	—
longer strided	shorter strided
more flexible	more tightly wound
wider tracking	narrower tracking
moves out with more _____	moves out with less _____

Volume and Capacity

More Desirable Characteristics	Less Desirable Characteristics
bigger volumed	—
higher capacity	less capacious, tighter ribbed
roomier middled	—
looser middled	tighter middled
deeper chested	shallower chested
deeper ribbed	shallower ribbed
deeper sided	—
deeper flanked	shallower in (his/her) flank
looser flanked	tighter in (his/her) flank
wider based	narrower based
wider through (his/her) lower one-third	narrower through (his/her) lower one-third
wider through (his/her) chest floor	narrower through (his/her) chest floor
wider sprung	—
bolder sprung	—
more expanded in (his/her) chest floor	narrower chested
more expanded in (his/her) forerib	pinched in (his/her) forerib
more natural width through (his/her) rib	constricted in (his/her) rib
more internal capacity	less capacious

Muscle

More Desirable Characteristics	Less Desirable Characteristics
heavier muscled	lighter muscled
more expressively muscled	flatter in (his/her) muscle
more natural thickness _____	lacks muscle expression _____
more natural turn of top	—
more desirable turn to (his/her) top	—
pushes more stifle on the move	flatter in (his/her) stifle
wider and more expressively muscled from stifle to stifle	—
wider and squarer rump	narrower through (his/her) rump
thicker through (his/her) rump	—

Condition

More Desirable Characteristics	Less Desirable Characteristics
leaner turn to (his/her) top	more condition over (his/her) loin edge
less condition over (his/her) loin edge	wastier over (his/her) loin edge
leaner through (his/her) lower one-third	pushes more fat in (his/her) elbow pocket
cleaner topped	plainer down (his/her) top
leaner made	heavier conditioned
leaner designed	has more fat _____
had a groove down (his/her) top	plainer down (his/her) top
had a dimple above (his/her) tail	—

Market and Carcass

More Desirable Characteristics	Less Desirable Characteristics
more producer oriented	less producer oriented
more packer oriented	less packer oriented
more packer acceptable	less packer acceptable
more industry oriented	less industry oriented
required fewer days to 230	required more days to 230
took fewer days to reach 230	took a greater number of days to reach 230
should rail _____	—
higher lean-to-fat ratio	—
heavier muscled carcass	lighter muscled carcass
carcass with the most edible lean	carcass with the least edible lean
carcass with a higher percentage muscle	carcass with a lower percentage muscle
carcass with a higher percentage ham/loin	carcass with a lower percentage ham/loin
carcass with a higher percentage lean cuts	carcass with a lower percentage lean cuts
carcass with more loin muscle area	carcass with less loin muscle area
more muscular turn to (his/her) top	—
more muscle thickness deeper into the ham	—
wider in the lower one-third of the ham	narrower in the lower one-third of the ham

Femininity and Underline

More Desirable Characteristics	Less Desirable Characteristics
more feminine fronted, as evidenced by _____	—
longer in her neck	shorter in her neck
longer fronted	shorter fronted
higher quality underline that was _____	poorer quality underline that was _____
more functional underline	blind teats
more evenly spaced teats	uneven in her teat spacing
more refined teats	thicker, coarser teats
more numerous	—
more prominent underline	possessed a pin teat (where?)
—	was blunt in her teats (where?)
—	looser in her rear udder sections

Performance and Miscellaneous

More Desirable Characteristics	Less Desirable Characteristics
more desirable EPDs across all traits	—
more desirable _____ EPDs	less desirable _____ EPDs
more potential to sire pigs with [width, muscle, growth, leanness, soundness, confinement adaptability]	less potential to sire pigs with [width, muscle, growth, -, -, confinement adaptability]
should sire pigs with more [width, muscle, growth, leanness, soundness, confinement adaptability]	should sire pigs with less [width, muscle, growth, -, -, confinement adaptability]

Performance Data for Swine

As with classes of beef cattle and sheep, inclusion of performance data with a class of swine challenges you to make complex decisions while using a variety of information. In addition to evaluating the physical characteristics of each animal, you also must consider the appropriateness of the data for the given production situation. A complete understanding of the following swine production terms will enable you to evaluate a class of swine more critically.

- **Birth Date** – Actual date an animal was born.
- **Number Born Alive** – The number of pigs in a litter that were born alive (actual, NBAEPD).
- **Number Weaned** – The number of pigs in a litter that were weaned. The standard weaning age for swine is 21 days (actual).
- **Litter 21-Day Weight** – Weight of an entire litter of pigs between 14 and 28 days of age and adjusted to a constant age of 21 days (actual, ratio, LW21EPD).

- **Sow Productivity Index** – Also referred to as SPI. The sow productivity index is an indicator of maternal ability, and it combines the number of pigs born alive and the 21-day litter weaning weight into an index (actual, ratio).
- **Days to 230 Pounds** – An indicator of growth rate, days to 230 is the number of days that a hog required to reach 230 pounds. A lower number is more desirable than a higher number (actual, DAYSEPD).
- **Backfat Thickness** – The depth of backfat listed either as average backfat thickness or 10th-rib fat depth. A lower number indicates that a hog is leaner than a hog with a higher number (actual, ratio, BFEPD).

Expected Progeny Differences (EPDs) for Swine

Much like sheep producers, swine producers have requested more objective selection tools for selecting replacement gilts and boars within and across herds. Expected progeny differences have been used in the beef cattle industry for some time and are now also being used in swine selection programs. These EPDs are very similar to those used by the beef cattle industry to predict progeny performance of animals.

Expected progeny differences for swine have been developed primarily for the economically important traits associated with swine production: an indication of maternal ability and of growth and carcass characteristics. The EPDs include the following:

- **Maternal EPDs**
 - **Number Born Alive (NBA)** – Daughters of sires or dams with a positive NBAEPD would farrow larger litters than sows with an NBAEPD of 0.
 - **Litter 21-Day Weight (LW21)** – A positive LW21EPD indicates that daughters of sires or dams would produce litters heavier than average.
- **Growth and Carcass EPDs**
 - **Days to 230 (DAYS)** – A DAYSEPD of -3.00 indicates that progeny from this boar or gilt should reach 230 pounds 3 days sooner than progeny from an animal with a DAYSEPD of 0.
 - **Backfat Depth (BF)** – An BFEPD of -.05 indicates that a boar should sire pigs having .05 inches less backfat than pigs from a boar with a BFEPD of 0.

Careful interpretation of EPDs for swine is necessary. Most producers want large litters of pigs that wean heavier, reach market weight sooner, and have less backfat. Therefore, NBAEPD and LW21EPD should be positive, indicating more pigs in the litter and heavier pigs at 21 days of age. Also, DAYSEPD and BFEPD should be negative, indicating fewer days required to reach 230 pounds and less backfat thickness at 230 pounds.

Selection indexes have been incorporated into the genetic evaluation of swine performance records. These selection indexes provide for consistent and accurate combining of various performance traits.

- **Sow Productivity Index (SPI)** – Ranks individuals on the number born alive (NBA) and litter 21-day weight (LW21). It does not include any growth or carcass information.
- **Maternal Line Index (MLI)** – This index uses growth and maternal EPDs, with emphasis on maternal EPDs for a maternal line.
- **General Purpose Index (GPI)** – Ranks animals on both growth and maternal traits. This index is well suited for use on maternal and paternal lines, as in a rotational crossbreeding system.
- **Terminal Sire Index (TSI)** – Ranks individuals on days to 230 (DAYS) and backfat depth (BF) only. This index does not include any maternal information.

All four indexes are listed in a manner similar to that for ratios (average = 100), with superior parents having values greater than 100 and inferior parents having values less than 100. These selection indexes have been developed based on the economic values associated with costs of production. Therefore, each index is listed in dollar units. For example, consider that a sow's SPI is 106; then each of her daughters would be expected to produce litters worth \$6 more at 21 days of age than the daughters of a sow with an SPI of 100.

Production Situations for Swine

Production situations for swine classes with performance data take on slightly different formats than for classes of beef cattle or sheep. In the scenarios for swine, a complete description of the following important factors must be addressed:

- **Breeding Program**
 - What type of breeding program is being used?
 - How are the selected animals to be used in that program?
- **Marketing Program**
 - How are the hogs marketed?
 - For what type of buyer are the hogs being produced?
- **Type of Environment**
 - In what type of environment are the hogs being raised? Examples: confinement, partial confinement, or nonconfinement.

The combination of a situation, performance data, and visual appraisal offers you the opportunity to make real-life animal-selection decisions.

Scenario 1: Hampshire Boars

Assume these Hampshire boars are to be used as terminal sires on Yorkshire x Landrace sows. You do not retain any gilts as replacements; therefore, all hogs are sold as market hogs. You generally sell market hogs on a carcass merit buying program, and all of your hogs are raised in confinement.

Table 10. Performance data for Hampshire boars.

No.	Birth Date	Dam's SPI	Days to 230	Adj. 10th-Rib Fat	Loineye Area
1	10/20	104	165	.81	5.95
2	10/24	101	165	.71	6.05
3	10/31	101	173	.67	5.70
4	11/2	100	157	.73	6.65

Scenario 2: Yorkshire Gilts

Rank these gilts as you would use them as replacements in a purebred Yorkshire herd. You profit mainly from the sale of performance-tested boars and gilts to commercial swine operations; however, you do sell a few boars as herd sires. All of your hogs and your customers' hogs are raised in total confinement.

Table 11. Performance data for Yorkshire gilts.

No.	Birth Date	NBA	LW21	Days	BF
1	3/27	+0.25	+1.92	-1.22	-0.03
2	4/4	+0.32	+3.40	-2.18	-0.01
3	4/8	+0.15	+2.33	-0.94	+0.04
4	4/8	-0.05	-0.39	-2.05	+0.04

Scenario 3: Duroc Boars

Assume these boars are to be used in a three-breed rotational crossbreeding system (Duroc x Yorkshire x Hampshire). Before selling feeder pigs, a group of replacement gilts is selected to be retained for breeding purposes. All hogs are maintained in a partial confinement situation.

Table 12. Performance data for Duroc boars.

No.	Birth Date	NBA	LW21	Days	BF
1	2/10	-0.11	-2.22	+1.24	+0.01
2	2/15	+0.05	+0.55	-2.15	-0.07
3	2/17	-0.07	-1.38	-0.85	-0.03
4	2/20	+0.08	+1.33	-3.42	-0.05

Scenario 1

Priorities: Select boars that will increase performance of growth and carcass traits. Growth and carcass traits are extremely important because all hogs are sold as market hogs. Soundness is a priority.

Scenario 2

Priorities: Balanced program in all areas. Select gilts that are strong in maternal, carcass, and growth traits. Soundness is a priority.

Scenario 3

Priorities: Select boars that are strong in maternal traits (NBAEPD and LW₂₁EPD) and growth traits (DAYEPD). Backfat EPD is of no concern in this scenario.

Sample Oral Reasons for Swine

Market Hogs: 2-4-1-3

"My placing of the market hogs was 2-4-1-3. I started with 2, as he had the best combination of muscle volume, leanness, and capacity in this class. Ideally, I would have liked to see my class winner more correct structurally and freer moving. Even so, I used 2 over 4 in my top pair as he was more pulled apart at his blades and carried more width and expression of muscle down his top and into the center and lower portions of his ham. He was also a trimmer made barrow that showed more blade action on the move and pushed less fat into his elbow pocket; he should hang the carcass with the highest percent muscle in the class. I concede that 4, the blue-butt barrow, was a more structurally correct barrow that was leveler topped and freer moving.

In a closer middle pair, I placed 4 over 1, as 4 was a more producer-oriented and practical barrow. He was a bigger volumed barrow that had more width to his chest floor, had more dimension to his rib, and was more expanded through his lower one-third. He was a more structurally correct barrow, with more give and cushion to his knee and hock. I recognized 1 as being a trimmer made barrow, with less fat out over his loin edge, but he was a narrow-made barrow that was constricted in his chest floor, flatter ribbed, steeper out through his rump, and straighter on his front and rear underpinning.

Nevertheless, in my bottom pair, I placed 1 over 3, as 1 was a leaner made, more packer-acceptable barrow. He was a longer bodied barrow that showed more overall muscle expression and dimension down his top and through the

base of his ham. He had less fat over his blades and should hang a carcass with more packer and consumer appeal. I grant that the black barrow was deeper flanked and looser made, but he was a short-bodied barrow whose combination of wide top and narrow base indicated he was the fattest barrow in the class. Thank you."

Hampshire Gilts: 3-4-2-1

"My placing of the performance Hampshire breeding gilts was 3-4-2-1. I started with 3, as she combined muscling, broodiness, and performance data to the highest degree. Ideally, I would have liked to see my class winner even longer fronted.

Realizing this in my initial decision, I still preferred 3 over 4, as 3 was the thickest hiped, heaviest muscled gilt that displayed the most volume of ham and had the most shape and dimension down her top, both visually and by the paper. More importantly, she was the boldest bladed, broodiest appearing gilt that had the most depth and spring to her fore and center rib, while possessing the highest dam's SPI.

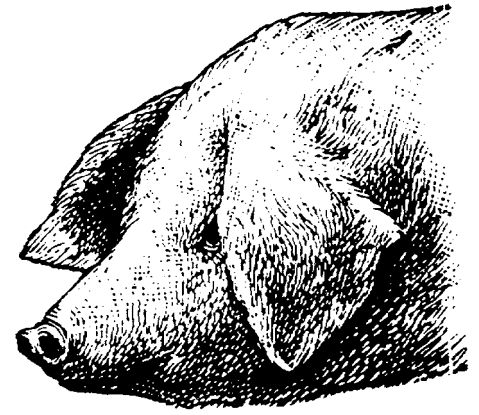
I will admit that 4 was a longer fronted gilt that was cleaner through her lower one-third.

In my middle comparison, it was 4 over 2, as 4 was a taller fronted, larger scaled gilt that was longer bodied and later maturing. She, too, was a nicer designed, more structurally correct female that was leveler topped and had a more correct slope to her shoulder.

I grant that 2 was another clean-headed, lean-designed gilt that scanned with a larger loineye.

With this in mind, it was 2 over 1 in my final decision, as 2 was a cleaner bladed gilt that was freer of fat through her lower body. She also had more lean muscle shape down her top both visually and by the scan data. In addition, she had a more distinct, higher quality underline, with a higher teat count.

There was no doubt that 1 was a bolder ribbed, sounder structured female that required fewer days to reach 230. However, this failed to compensate for the fact that she was the heaviest conditioned gilt with the poorest quality underline and the lowest in her dam's SPI. Quite simply, she was the least scenario-suited gilt in this class. Thank you."



Glossary

Accuracy (Reasons) – In a livestock judging contest, the contestant's ability to describe correctly the differences among animals in a class.

Actual Data – The actual records of the individual. For example, an Angus bull calf might have a 600-pound weaning weight, a Dorset ewe might have a 90-pound weight at 90 days, or a Hampshire boar might have a loin-muscle area of 6.55 square inches.

Adaptability – The ability of an animal to adapt to changes in the environment in which it lives.

Age-Weight Categories (Sheep) – Specific ages at which an animal's weight should be taken and recorded for evaluation of performance records and calculation of the appropriate FEPDs.

Backfat Thickness (Swine) – The depth of backfat, listed as either average, last-rib backfat thickness, or 10th-rib fat depth. A lower number indicates a leaner hog; a higher number, a heavier hog.

Barrow (Swine) – A castrated male; a castrated boar pig.

Birth Date – The date an animal was born.

Birth Weight – The weight of an animal at birth. Heavy birth weights are associated with calving problems in beef cattle, lambing problems in sheep, and farrowing problems in swine. Heavier weights are usually associated with greater survival rates.

Boar (Swine) – An intact male; a male that is not castrated; a male capable of breeding females.

Bovine (Beef Cattle) – Scientific name for domestic beef cattle.

Breed Character – Particular characteristics of separate breeds (such as color, horns, ear set, and wool type) that distinguish animals among the various breeds.

Breed Class – Any set of categories that classifies breeds according to appearance or function.

Breeding Animal – An animal kept for the purpose of breeding, as opposed to a market animal.

Bull (Beef Cattle) – An intact male; a male that is not castrated; a male capable of breeding females.

Calf (Beef Cattle) – A bovine that is younger than 1 year of age.

Calving Ease (Beef Cattle) – The ability of a heifer, or cow, to deliver a calf without difficulty.

Carcass – The muscle, bone, and fat associated with the slaughter of an animal after removal of the head, hide, and viscera (internal organs).

Carcass Length (Swine) – The linear measurement from the anterior of the first rib to the anterior of the aitch bone (hipbone).

Carcass Quality – The observed properties of a carcass that may directly or indirectly influence the palatability characteristics of the edible lean meat.

Completeness (Reasons) – In a livestock judging contest, the contestant's ability to describe thoroughly the differences among animals in a class.

Conformation – The overall composition or appearance of an animal or a carcass.

Cow (Beef Cattle) – A female that has had a calf.

Cutability – The percentage of boneless, closely trimmed retail cuts of a carcass.

Dam – The female parent of an animal.

Days to 230 (Swine) – An indicator of growth rate, days to 230 is the number of days that a hog required to reach 230 pounds. A lower number is more desirable than a higher number.

Delivery (Reasons) – The manner with which a livestock judging contestant presents his or her reasons.

Distance (Reasons) – How far a livestock judging contestant stands from the judge. Depending on voice and stature, the distance varies. A distance of 6 to 10 feet is generally adequate.

Dressing Percent – The proportion of carcass weight to live weight of an animal; carcass weight divided by live weight.

Early Maturing – An animal or breed that typically reaches puberty and the ability to reproduce at an earlier age than other animals of that breed or species.

Ewe (Sheep) – A female sheep of any age.

Expected Progeny Difference – An expected progeny difference (EPD) takes into account the relationships in a pedigree and predicts how progeny or offspring of a particular animal should perform relative to animals from an average parent.

Eye Contact (Reasons) – The livestock judging contestant should look at the person that is listening to his/her reasons. If eye contact is maintained throughout the entire set, his/her delivery will be more professional.

Fat Depth 10th-Rib (Swine) – The linear measurement of fat taken at the 10th rib and at a position that is three-fourths of the length of the loin eye.

Fat Thickness (Sheep, Beef Cattle) – The typical linear measurement of fat taken over the ribeye.

Feed Efficiency – The calculated measurement of conversion of feed to body weight gain; pounds of feed divided by pounds of body weight gain.

Fertility – The associated characteristics of reproduction.

Fleece (Sheep) – The coat of wool covering a sheep.

Fleece Clean Weight (Sheep) – The weight, in pounds, of a fleece that has been washed appropriately.

Fleece Grade (Sheep) – The classification system used to describe grease wool. Three systems are used: the blood, or American, system; the numerical, or English, system; and the metric system.

Fleece Grease Weight (Sheep) – The weight, in pounds, of a freshly shorn fleece that has not been washed or scoured.

Fleece Staple Length (Sheep) – The length, in inches, of a lock of shorn wool.

Fleece Type (Sheep) – A classification system to group sheep according to wool quality. Fleece type or wool type is considered fine, medium, long, or crossbred and describes the type of wool fiber characteristic of the breed.

Flock EPD (Sheep) – These EPDs are similar to those used by the beef cattle industry to predict progeny performance of the animal. The EPDs can be listed as such, or they may take the form of flock expected progeny differences (FEPD) for sheep; presently, they can be used only within a flock.

Flow (Reasons) – The way words are put together into phrases, sentences, and paragraphs is considered flow. A smooth flowing set of reasons is desirable.

Frame Score (Beef Cattle) – A numerical value associated with height at the hip, in inches, for a particular age.

General Purpose Index (Swine) – Ranks hogs on growth and maternal traits and is well suited for use in a rotational crossbreeding system.

Gilt (Swine) – A female that has not had a litter of pigs.

Gregariousness (Sheep) – The characteristic of a group of sheep to remain in close proximity to one another; flocking instinct.

Growth Rate – Typically, the pounds of body weight gained during a specified period of time (average daily gain).

Hardiness – The ability of an animal to withstand the environment.

Heifer (Beef Cattle) – A female that has not had a calf.

Hip Height (Beef Cattle) – Height at the hip, in inches.

Inflection (Reasons) – Voice inflection is one of the most important items in the delivery of oral reasons. Emphasis should be placed on the words that describe the important differences among animals and the important characteristics of each animal.

KP Fat Percent (Sheep) – The amount of fat contained in the kidney and pelvis regions relative to the carcass weight.

KPH Fat Percent (Beef Cattle) – The amount of fat contained in the kidney, pelvis, and heart regions relative to the carcass weight.

Lamb (Sheep) – Any sheep younger than 1 year of age.

Late Maturing – An animal or breed that typically reaches puberty late; the ability to reproduce at a later age than other animals of that breed or species.

Leg Score (Sheep) – The subjective characteristic indicative of the total volume of muscle in the leg of a lamb. Muscle volume in the leg is reflective of total carcass muscle.

Litter Size (Swine) – The number of pigs in a litter.

Litter Weight 21 Days (Swine) – Weight of an entire litter of pigs between 14 and 28 days of age and adjusted to a constant age of 21 days.

Loin Muscle Area (Swine) – The surface area of the *Longissimus dorsi* muscle at the 10th rib of a pork carcass.

Market Animal – Any young animal intended for slaughter.

Maternal – The dam or the dam's side of the pedigree.

Maternal Line Index (Swine) – Ranks hogs by growth traits and maternal traits, with emphasis on the maternal EPDs.

Mature Cow Weight (Beef) – Average weight of a group of cows from 6 to 10 years of age.

Milking Ability – The ability of a female to produce milk. Typically, larger quantities of milk result in heavier offspring at weaning.

Number Born Alive (Swine) – The actual number of pigs in a litter that were born alive.

Number Weaned (Swine) – The number of pigs in a litter that were weaned. The standard weaning age for swine is 21 days.

Organization (Reasons) – The manner in which notes are assembled and reasons are presented to an official judge.

Paternal – The sire or the sire's side of the pedigree.

Pedigree – A diagram of the sire, the dam, and the grandparents of an animal (similar to a family tree).

Percent Muscle (Swine) – The amount of lean meat contained in the carcass of a pig relative to the carcass weight.

Performance Data and Records – Objective numerical indexes of economically important traits associated with livestock production.

Pigment (Beef Cattle) – The characteristic color found around the eyes of certain breeds of beef cattle.

Polled (Beef Cattle) – Natural trait of not having horns nor the genetic ability to develop horns.

Postweaning – After weaning.

Prewaning – Before weaning.

Presentation (Reasons) – The manner in which oral reasons are spoken to an official judge.

Production Situation – A description of particular limitations or goals of a breeding program that provides guidance for selection decisions involving the use of performance records (sometimes called scenario).

Progeny – All offspring from a particular parent animal.

Prolificacy – The ability to reproduce in quantity.

Puberty – The age at which an animal is capable of reproducing.

Quality Grade – Those factors associated with palatability characteristics of the lean, edible portion of meat, including color, texture, firmness, marbling, and age.

Ram (Sheep) – An intact male; a male that is not castrated; a male capable of breeding females.

Ratio – To rank animals within the same herd or flock, a ratio is used generally. A ratio consists of a number, typically around 100, that compares each animal to the other animals in a particular group. Any number less than 100 indicates that the animal's performance was inferior to or less desirable than the average of the group; any number greater than 100 indicates that the animal's performance record was superior to or more desirable than the average of the group.

Reasons – The verbal justification for placing animals in a certain order.

Ribeye Area (Beef Cattle, Sheep) – The surface area of the *Longissimus dorsi* muscle between the 12th and 13th ribs of a beef or lamb carcass.

Scrotal Circumference (Beef Cattle, Sheep) – The distance around the testicles in the scrotum of a bull or ram, in centimeters, usually adjusted to 365 days of age. A greater scrotal circumference indicates that a male should have the capacity to produce greater volumes of semen, and his progeny should reach puberty at earlier ages.

Sire – The male parent of an animal.

Sow (Swine) – A female that has had a litter of pigs.

Sow Productivity Index (Swine) – Also referred to as SPI. Sow productivity index is an indicator of maternal ability and combines the number of pigs born alive and the 21-day litter weaning weight into an index.

Stance (Reasons) – The way a judging contestant stands when giving reasons. When the contestant gives a set of reasons, the situation should be as comfortable as possible for the judge and for the contestant.

Steer (Beef Cattle) – A castrated male; a castrated bull.

Terminal Sire – A breeding male that is used for generating market animals; it typically has a high growth rate and desirable carcass characteristics.

Terminal Sire Index (Swine) – Ranks hogs on DAYSEPD and BFEPP only and does not include any maternal information.

Terminology (Reasons) – The words and phrases used to describe differences among animals.

Type of Birth (Sheep) – The number of lambs born to a ewe. The following designations are used: S-single, TW-twin, TR-triplet, and Q-quadruplet.

Type of Rearing (Sheep) – The number of lambs raised by a ewe. The following designations are used: S-single, TW-twin, TR-triplet, and Q-quadruplet.

Underline (Swine) – The teats or nipples on the underside or belly of a pig.

Volume (Reasons) – How loud a contestant talks when giving reasons. The volume used to deliver reasons depends on how the contestant normally speaks and the size of the room.

Weaning – The time when young animals are removed from their mothers and are forced to give up their dam's milk as a source of nutrients.

Weaning Weight – The weight of an animal at weaning or at a standard weaning age. Adjusted weaning weight is calculated for one of the standard weaning ages listed, and the standard age is listed, also. The weight of a calf taken from 160 to 250 days of age and then adjusted to a constant age of 205 days. Standard weaning ages for lambs are 45, 60, 90, and 120 days. The standard weaning age for swine is 21 days.

Wether (Sheep) – A castrated male sheep; a castrated ram.

Yearling – An animal that is more than 1 year of age, but not more than 2 years old.

Yearling Weight – The weight of an animal taken after 330 days of age and adjusted to a constant age of 365 days.

Yield Grade (Beef Cattle, Sheep) – The numerical designation (1–5) for the percentage of boneless, closely trimmed, retail cuts obtained from a carcass.

Publication 2289 (POD-02-26)

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Gale Chrestman, Keith A. Bryan, and Lowry Sumrall provided photography for the publication. The authors greatly appreciate the efforts and support of Roy Higdon, Mike Howell, and Blair McKinley for reviewing this publication. Donald L. Boggs and Robert A. Merkel are acknowledged for giving their permission to use material adapted from *Live Animal Carcass Evaluation and Selection Manual*, 4th edition, 1993. Gary L. Minish and Danny G. Fox are acknowledged for giving their permission to use material adapted from *Beef Production and Management*, 2nd edition, 1979.

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Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. ANGUS L. CATCHOT JR., Director

