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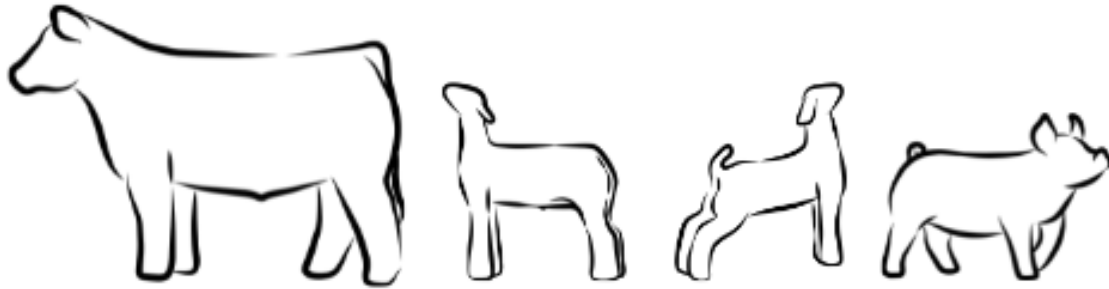# LIVESTOCK EVALUATION

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What is Livestock Evaluation?

Livestock evaluation is a blend of some science and a bit of "art" to understand the relationships of how an animal is structurally built and its function. Livestock evaluation skills include understanding various stages of livestock production in multiple species, discerning the skeletal structure of an animal, evaluating various levels of muscling and fat, interpreting and applying genetic information such as performance data or DNA testing results. These skills are used by producers to make genetic improvement in their herds and flocks.

Livestock judging competitions involve the ranking of four animals relative to an ideal animal and each other. Classes can be made up of market or breeding animals, and most contests will have beef cattle, sheep, swine and meat goats. Participants may have to answer questions about a class or give oral reasons. At the college level, contestants place 12 classes of livestock and give 8 sets of oral reasons. At the youth level, there are contests for 4-H and FFA members, and some breed associations host contests.

Like any team event, livestock judging takes commitment, practice, and lots of hard work. It can also be life changing, opening doors for college scholarships, job opportunities and networking with members of the livestock industry. It is mentally challenging and rewarding!

Potential Classes at Contests

Market steers
Market lambs
Market hogs
Market goats
Heifers (breeding beef females of a variety of ages)
Bulls (breeding beef intact males of a variety of ages)
Ewes (breeding sheep females of a variety of ages)
Rams (breeding sheep intact males of a variety of ages)
Gilts (breeding swine females of a variety of ages)
Boars (breeding swine intact males of a variety of ages)
Does (breeding meat goat females of a variety of ages)

Human Tendencies to "Goof Up" in Judging

By Jerry Hawkins

AUTHORS NOTE: Mr. Jerry Hawkins was a well-respected, beloved livestock judging coach at Claredon College in Texas from 1974-2003. He passed away in 2006 at the age of 71, however his wisdom is always relevant for livestock judging team members. The following is a document that Mr. Hawkins put together during his tenure at Claredon College. For those that had a chance to meet Mr. Hawkins, his big, generous personality will always be remembered! This section is Mr. Hawkins words, it has not been edited.

After several years of instructing students in the art of livestock judging, in a haphazard manner, I have determined there are certain tendencies that are natural for a person to do and that are detrimental to being successful in competitive judging. The judging team coach must be aware of those tendencies and instruct members how to avoid those pitfalls.

1. ***Not work on or think about livestock judging for 15 minutes a day.*** It is a tendency for a student not to think about judging except for those days of workouts or on the way to contests. I believe that a student needs to spend a minimum of 15 quality minutes on judging to reach their full potential. "There is no business or vocation, whatsoever, which will not permit a man who has the inclination to give a little time every day to study," said Daniel Wyttenbach.

2. ***Judge to suit parents or older siblings etc., to please them when your heart's not in it.*** It is a human tendency for students to judge because of their parents, siblings or someone else wants them to. It is difficult for a student to become a successful judge if they do not want to do it for themselves. Your dedication and enthusiasm will be lacking. Aristotle said, "All men seek one goal; success or happiness. The only way to achieve true success is to express yourself completely in service to society. First, have a definite, clear, practical ideal-goal, and an objective. Second, have the necessary means to achieve your ends-wisdom, money, materials and methods. Third, adjust all your means to that end."

3. ***Try to beat someone or another team instead of just doing the best that you can.*** You cannot do any better than your best. If you worry about someone beating you, this is admitting that they might be better. If a team member will attempt to do the best on every class and every set of oral reasons, winning will take care of itself. A student can do no better than their best and has no control over the work of another judge. "I count him braver who overcomes his desires than him who conquers his enemies for the hardest victory is the victory over self," –Aristotle.

4. ***To visit instead of thinking about the class you are going to judge.*** One of the most frustrating things to a judging team coach is to go to a workout and have your students blow the first class of the day. For years, I wasted many first classes in workouts. I started having my students to think and visualize what the ideal animal for the particular class should look like before turning to judge the class. This practice helped that problem very much. In a contest, the student should start visualizing what the ideal animal should look like in the next class as soon as they turn in their card of the class just finished.

5. ***Eliminate an animal without analyzing the class completely.*** It is easy to roll an animal to the bottom if it is not an easy top. This happens often with show steer people who sometimes put too much emphasis on profile. It also happens on poor quality classes, where the first animal you look at may be low quality and if you then decide he goes bottom, it becomes difficult to place the animal second where he might belong. A logical decision or placing is often sidetracked with quick judgments.

6. ***Place the class on one trait (muscle, frame etc.).*** This problem is the opposite of elimination but again happens often with those students with the specie that they show. Sometimes a coach will over emphasize certain traits before a contest and a student will overreact. This probably happens more often in femininity in heifers when a student will start a class with a very feminine heifer that gives up too much volume.

7. ***Panic on a difficult class.*** You must believe that you have worked as much as anyone and if this class is difficult for you, it is difficult for everyone. Turn your back to the class and remind yourself what the important placing factors are for this class and then turn around, place the class and forget it. You cannot afford to let one class that is difficult ruin the entire contest for you. You can place a class by charting the important factors. For example, market lambs are placed on the following: balance, muscle, finish and frame. Place the lambs on each of the first three traits and use frame to break the tie.

> Balance 2-3-4-1
> Muscle 4-3-1-2
> Finish 3-4-2-1
> Assign points based on placing (1st=1, 2nd=2, 3rd=3, 4th=4).

In the above example the points would be as follows 1= 11, 2=8, 3=5, 4=6 therefore the placing would be 3-4-2-1 unless 4 is significantly bigger framed to beat 3. Another method to placing a challenging class is to ask "Does one have enough good to be in the top pair or does the animal have enough bad to be in the bottom pair?" For example, in the above example a student could logically say 3 and 4 have enough good to be in the top pair. This is one manner that a student can work on a class instead of a class working them. Whatever system or method is used, a student needs a systematic way to work through those difficult classes to prevent destruction of their confidence that could ruin the rest of their day. Many times the best judge you have catches this class early on in the contest and ends up having a bad day; while a weaker judge gets this class towards the end and therefore the better judge has less confidence in his placing of the remaining classes. These types of classes should be avoided when possible, especially

before a contest. However students need to know how to handle them if they are there. In contest situations, classes are always put together with a placing in mind but can sometimes change overnight to create a tough class. Early philosopher Pliny explains how systematically working to overcome difficult classes can become less frustrating "Accustom yourself to master and overcome things of difficulty; for if you observe, the left hand for want of practice is insignificant and not adapted to general business but it holds the bridle better that the right, from constant use".

8. ***Think that you can remember the class and not take enough notes.*** You do not need to write out long statements but you need to have enough notes so that you can have every important point that determined the placing. This is also the best time to rank the important factors in placing each pair.

9. ***Worry about whether or not you filled in the judging card correctly or even marked your placing.*** This can wreck your confidence as you go to the next class. You should not have to worry about this. Airplane pilots have a check list before taking off. This is to protect their life. My students have a system because a mechanical error is inexcusable. We write the placings down in the front of our judging books and then circle the placing after we fill in the card, which indicates the placing in their book is the one they turned in. This will also prevent you from filling out your card and placing it in your pocket. It is a tremendous shock later to discover that the card you thought you handed in two classes before is still in your pocket. On reasons classes, sometimes people change their minds towards the end of the time allotment and the notes are not like the placing you turned in and when you get ready to study your reasons you are confused about which placing you actually turned in. This system will eliminate this worry.

10. ***Worry about the placing on the class just judged instead of getting ready for the next class.*** After you hand in your judging card you should immediately look and see what the next class is and turn your back to the class. Visualize the ideal animal for that class and prepare yourself mentally for the class. The mind cannot be turned on and off like a light switch; if you wait to the time to judge the class before you think about the class, quite often a panic situation can occur. "To grow and know what one is growing-that is the source of all strength and confidence in life," said James Baille.

11. ***Trying to place the next class before you move to the class.*** The angle and distance from the animals makes a big difference in how tall, thick or long they may appear. Once you get an impression in mind it is difficult to change it. Wait until the group leader tells you to start judging before you begin to analyze the class.

12. ***Trying to reinforce your confidence by looking at someone else's card or notes to see their placing.*** In practice it is tempting to ask other people how they placed a class or have input from other people to reach a committee placing. In a contest, the following could happen: You might place a class 1-3-2-4 and if you saw a placing 3-2-1-4 your

confidence would be undermined. The official could be 3-1-2-4 with cuts of 2-4-6. This could affect your confidence in giving reasons on this class

13. ***Visit between classes instead of mentally preparing for the next class.*** There is a time to play and a time to work.

14. ***Place a class too quickly.*** The coach and student should discuss this situation and correct it.

15. ***Place a class too slowly.*** You must correct this tendency in practice. The best method is by using a stop watch. A student that does this often panics when they start calling for cards. You do not have time to organize your notes and thoughts on reasons classes if you wait until the last few minutes to place the class.

16. ***Let other people irritate you.*** You have no control over someone else and must ignore them. Get busy and forget them!

17. ***Get frustrated because they changed the contest or did something different from what you expected.*** You cannot afford to get uptight over something you have no control over.

18. ***Worry about reasons takers.*** Remember they are there because they like young people and are just waiting to give a 50 score. There are several county agents that have listened to reasons at college contests and I can guarantee you they came out saying, "I heard a real good set from a young man or young lady."

19. ***Memorize your notes.*** When a person memorizes their notes, if anything gets jumbled you are in a wreck. When you go over your notes, visualize what the class looked like. You should go over your reasons several times without going over your notes. In contests, you can see judges reading their notes as they go to give their reasons, but by this time you should have your notes put away.

20. ***Use pet terms over and over.*** The best way to overcome this is to use a tape recorder or video camera to see if this occurs.

21. ***Worry about terms instead of truthfulness, meaning and sincerity of the terms.*** Terms should be those that are used by the people in the specific industry that the class represents. Too many students worry about fancy, flowery terms instead of being accurate. Reasons are selling to the reason's taker the ideas that you used to place the class. They need to be truthful and convincing.

22. ***To talk in great depth on the easy pair and not very much detail on the close pairs***. Points in the reasons room are made on the close pairs that are accurately discussed. Points are not earned by dwelling on the facts that anyone could see.

23. ***To avoid eye contact with the reason's taker when you become unsure or get rough in your delivery.*** You are a salesperson and it is hard to be effective when you cannot look someone in the eye while selling. The best way I know to avoid this is to give sets of reasons in the mirror. Another good method is for the team to practice in a circle and each person look at another person and everyone give a set at the same time. You are working on your concentration an when the team can do this in a sincere fluent manner while looking at one of their teammates.

24. ***To have too much body movement or other mannerisms that detracts from your reasons presentation.*** Giving sets in the mirror or using a video camera can help with this tendency.

25. ***To get tense when giving reasons.*** Relax. As you are walking up to give reasons you might take a deep breath and exhale. Break the ice with the reason's taker by saying "Are you ready sir/ma'am?" Be sure that you do not start your delivery as soon as you walk in the door. The reasons taker will generally indicate for you to begin. Good manners gain points and a sincere smile does not hurt!

26. ***To start your reasons over after messing up in the middle or bottom pair.*** If the student has a real good top pair, a rough middle pair and a "just want to get out of here" bottom pair usually means they fit this tendency.

27. ***Talk too soft or too loudly.*** The coach can indicate during practice by raising his hand or lowering it to correct the volume. The judge should know that as soon as he goes into the reasons room to look at the situation and gauge their voice to fit the surroundings.

28. ***Talk too fast or too slow.*** In many cases when the judging team member walks into the reasons room he starts gunning from the hip in rapid fire. The reasons taker is always a little behind, so make sure that there are pauses between pairs and at commas and periods. A video recording of a student's reasons will help also this situation. Students should also give their sets of reasons to people that they do not know.

29. ***Talk in a monotone or with too little or too much facial expression.*** Again, a video recording will make this tendency easy to see to the student. Make sure expressions are sincere.

30. ***To let down on the last few sets of reasons in a contest.*** Each set of reasons should be approached with the attitude that each set will be better than the last. Students should strive to earn a 50 on every class in practice and during a contest. Make students give reasons when they are tired. "Excellence is not an act, but a habit"- Aristotle.

31. ***To make classes in the contest harder than they are.*** The classes in the state 4-H contest are picked out with a logical placing in mind. If the judging team members try and

look for problems, they will find them. It is similar to when you were young and were walking in the dark, if you get to looking over your shoulder your mind can really make you imagine some frightening things. Frank Craddock picked out the classes for the Ft. Worth judging contest a few years ago. When one of the sheep committee members asked him, "Don't you think the classes are too easy?", he replied, "The will find some way to screw them up!"

32. ***To forget classes judged in workouts after the workout is over.*** I believe one of the biggest problems with our educational system today is we don't give our students time to think. A few years ago I was traveling with a horse team to College Station to the Southwest Collegiate Horse Judging Contest. We were working out with the Texas Tech horse team coached by Jim Heird. We finished working out at Ted Turner's and Jim said, "That finishes the workout, you can either go on to A&M or go with us." I decided to follow him. We left Ted's and went a few miles and turned down a farm to market road and went another two miles then turned down a dirt road where the tree lapped over the top of the road. We stopped and then he had his students get out and go over all of the classes we had that day. As the students were walking around remembering the classes Jim said, "Many judging team coaches work them hard, but never give them a chance to reflect on why classes were placed a certain way." I am sure many of you have been to fairs where they have trained chickens to do certain stunts when money is placed in the machine. These chickens learn by repetition. Give your students a good environment to stop, reflect, and remember the classes and why they were placed a certain way. If you can then get these members to go over the classes again before they go to bed they will retain more of the knowledge that you have worked so hard to give them that day.

33. ***To say we placed the last class/classes at _____ because of _____.*** Each class is different and the animals with the most good must go on top and the animals with the most bad go on bottom. Workouts where you can judge 5-7 classes of the same specie in either market or breeding helps correct this tendency. With this type of workout, you can have a class where the fat pig goes last and then have a pig that is the fattest in the class, but not too fat, win the class. It is important that students learn the various degrees of muscle, finish, frame, balance and structure. Livestock judging is the ability to recognize different degrees of a specific trait and to weigh the importance of each to place the class. We have very few perfect animals.

34. ***Make an excuse for your placing instead of trying to see why a class was placed a certain way.*** Some judges get very defensive of their placing and are more interested in defending their placing. "I don't care what anyone says, my placing is right." This type of attitude must be corrected early or a coach will be spending the rest of the season defending your placings. There can only be one coach and an argumentative student can make the judging season miserable.

35. ***To get tired and not be enthusiastic about a judging practice.*** Each practice is a small piece of the puzzle of successful judging and the student should avoid a negative

attitude. When a student misses a practice, it seems to come back and haunt not only them but also the team. Each workout is important. A student must continue to try and improve each day. "There have been a few moments when I have no complete satisfaction, but only a few. I have rarely been free from the disturbing realization that my placing might have been better," said Jan Paderewski.

36. ***To worry about a contest and develop a negative attitude.*** A student must tell them self that they have worked hard in preparation for the contest and approach the contest expecting to have fun and be competitive. The coach should have the students believing that they can do it. If the coach can get each team member to realize that they have worked hard and the contest is their reward, to relax and go into the reasons room with determination, winning will take care of itself.

37. ***For judging team coaches to become satisfied with their knowledge and stop seeking to improve their skills.*** Take advantage of the vast knowledge that good livestock people have and use it. More importantly, find out why a judge placed a class a particular way. A student does not deliberately bust a class and it is important that the coach understands and finds out what was going through their mind. "Anyone who stops learning is old, whether this happens at twenty or eighty. Anyone who keeps learning not only remains young, but becomes constantly more valuable regardless of physical capacity" –Harvey Ullman.

"The most important ingredient in training judging teams is the coach should keep in mind that judging should be fun. Young people take their show animals to the major shows in Texas and while showing you can see the sweat and hard work in the show ring. Even so, they have fun and can't wait until they show again. Judging competitively is hard work, but it should be fun. Keep your criticisms on a positive note. In training horses if you will make it easy for the horse to do what you expect of him, it will be more pleasant for him to do things right. If you hammer on him all of the time, he will not perform like you want him to. Work on trying to improve the judging team members self confidence and you will have a pleasant experience and do a lot more than just have a judging team." – Jerry Hawkins

"To grow and know what one is growing towards-that is the source of all strength and confidence in life" –James Baille

"Progress is not made by taking pride in our present standards, but by critically examining these standards, hypothetically setting higher standards and attempting to achieve them." –Juda Rosenstein

How Judging Contests Are Scored

Animals in a judging contest are marked 1, 2, 3 and 4 to provide easy identification for contestants and officials. Contestants will rank the animals from first to last, using their identification number. For example, if a student like animal number 4 the best in a class, their placing would start with 4. They would evaluate the remaining animals and assign to second, third, and fourth placings.

Below is a class of Hereford Heifers that Biozyme Sure Champ has in their judging archives. There are many great classes on their website (https://surechamp.com/category/judging/). The heifers are numbered from left to right. Participants would rank the heifers from best to worst and these placings would be compared to an "official placing".

Once the contestant has determined a ranking, they will "mark their card". There are 24 possible placings using 4 animals, the contestant would mark which placing they want to submit.

The image on the left is an example of a card that contestants would submit for scoring. There are many types of cards and scantrons used for scoring, all of them will have the 24 possible placings for participants to mark.

Each class in a judging contest is worth 50 points. Official judges (experts in a species of livestock) will discern and official placing and point values called "CUTS". A cut is the point value for a pair of livestock in the class. The maximum point value of the cuts on a class is 15 unless a cut of 5 or larger is used in the middle pair. In this case, the maximum is 14. These maximums have been put into place to prevent scores from falling below zero.

_____ - _____ **Contestant number**

_____ **Contestant Name**

_____ **Placing Score**

Judging Contest

Class # and Name

_____ _____

_____

Write in your placing

1st ____ 2nd ____ 3rd ____ 4th ____

	Circle your placing.
A	1234
B	1243
C	1324
D	1342
E	1423
F	1432
G	2134
H	2143
I	2314
J	2341
K	2413
L	2431
M	3124
N	3142
O	3214
P	3241
Q	3412
R	3421
S	4123
T	4132
U	4213
V	4231
W	4312
X	4321

13

A placing has 3 pairs, the top pair, middle pair and bottom pair. Therefore, there are three cuts assigned to each class. The official placing for the above class from Sure Champ is 3-4-1-2 with cuts of 534. This official placing and cuts indicate that heifer 3 is a fairly easy winner (loss of 5 points if missed), the middle paid of 4 over 1 is closer (loss of 3 points if missed) and 2 is logical for last place (loss of 4 points if missed). If a participant entered a placing of 3-4-1-2 for scoring that participant would earn a perfect score of 50 points.

Time to explore how other placings are scored, if it doesn't match the official placing! Each placing has 6 decisions that need to be made, and the points can be determined for each decision.

The examples below will use the official placing from the Hereford Heifer class above:

Official :	3	-	4	-	1	-	2
Cuts:		5		3		4	

Decision to be made:

Decision 1:   3 over 4   5 points
Decision 2:   3 over 1   5 + 3 points = 8 points
Decision 3:   3 over 2   5 + 3 + 4 points = 12 points
Decision 4:   4 over 1   3 points
Decision 5:   4 over 2   3 + 4 points = 7 points
Decision 6:   1 over 2   4 points

Pair Switch

These are the easiest to calculate. If a pair is switched, contestants will just lose the points of the cut.

Contestant placing: **4-3**-1-2 (top pair switch)
    Student missed placing 3 over 4 = minus 5 points for a score of 45 points (decision 1)

Contestant placing: 3-**1-4**-2 (middle pair switch)
    Student missed placing 4 over 1 = minus 3 points for a score of 47 points (decision 4)

Contestant placing: 3-4-**2-1** (bottom pair switch)
    Student missed placing 1 over 2 = minus 4 points for a score of 46 points (decision 6)

Simple Bust

A simple bust is when one animal is two places out of position. Here is an example of how a simple bust would be calculated:

Contestant placing: 4-1-**3**-2 (animal number 3 is in third place instead of first)
   Student missed placing 3 over 4 = minus 5 points (decision 1)
   Student missed placing 3 over 1 = minus 8 points (decision 2)
   Student placed 3 over 2 = no points lost (decision 3)
   Student placed 4 over 1 = no points lost (decision 4)
   Student placed 4 over 2 = no points lost (decision 5)
   Student placed 1 over 2 = no points lost (decision 6)
   Overall the student's score would be 50 - 5 - 8 = 37 points

Complete Bust

A complete bust is where there is at least a simple bust and usually a pair switch. These are the hardest to calculate.

Contestant placing: 2-1-4-3 (backwards from official)
   Student missed placing 3 over 4 = minus 5 points (decision 1)
   Student missed placing 3 over 1 = minus 8 points (decision 2)
   Student missed placing 3 over 2 = minus 12 points (decision 3)
   Student missed placing 4 over 1 = minus 3 points (decision 4)
   Student missed placing 4 over 2 = minus 7 points (decision 5)
   Student missed placing 1 over 2 = minus 4 points (decision 6)
   Overall the student's score would be 50 - 5 - 8 - 12 - 3 - 7 - 4 = 11 points

Oral Reasons

Oral reasons are a short (two minutes or less) presentation where students explain to an official why they placed a class the way they did. This defense of a decision should be presented in an organized, logical format. The contestants goal is to convince the official that their placing is correct by incorporating accurate descriptions of the animals along with clear reasoning of your priorities.

Oral reasons provide a ground for many life lessons that can't be learned by placing a class and turning in a card. At its very core, livestock judging and oral reasons are about developing critical thinking skills. Oral reasons teach you how to make a smart, educated decision in a short amount of time. You learn how to justify your decisions to industry members. You challenge yourself and discover what it means to find self-confidence from within. You find out more than you ever dreamed you would about livestock - structure, movement, design, balance, muscle, and the list goes on. You figure out how to set goals for yourself and work hard to achieve them. When it comes to giving oral reasons, you can always improve. You can always give a better set - and that is the most exciting part!

There are 3 steps necessary to developing a set of reasons:

1. Taking Notes
2. Format
3. Transitions

Step 1 - Note Taking

The first thing you need to do is take good notes on the class. Look for identification differences and the main reasons why you have placed one animal over another. Then, after you get the big notes, start noting some of the smaller details that will show that you have evaluated the class carefully. These details will add the extra touch to your reasons, and will help them stand out from the others. Take your notes in the format that you plan to use in your oral reasons (See example formats).

Good note taking is essential to developing quality reasons. A judging book (6" by 8" in size) helps with taking notes and keeping track of placings. Inside your judging book, you will create a template that will help you organize your thoughts for a reasons or questions class. Below is the most effective way to draw out a reasons template similar to the following image:

Class Name
Your placing (1-2-3-4)

ID
1 -
2 -
3 -
4

	Why 1 beats 2	Grant 2
1/2		
		criticism .
	Why 2 beats 3	Grant 3
2/3		
		Criticism 3
	Why 3 beats 4	Grant 4
3/4		
		Why 4 last

Using a template like the one above will ensure that a student delivers a logical set of reasons that have a "flow". Students should prepare this template prior to any competitions or practices. Follow these steps in developing notes for a specific class:

1. Draw format in notebook.
2. Enter CLASS NAME at the top.
3. Document simple identifying features of each animal in the class (color, sex, markings, etc.).
4. Record your PLACING below the class name after you have studied the class and made a decision.
5. Consider a note regarding why the first animal wins and what you might change if you could.
6. The remaining grids are for comparisons, grants and criticisms and are organized by TOP, MIDDLE, and BOTTOM PAIRS.
    a. Comparison: why does one animal beat the other in the pair.
    b. Grant: what advantage does the lower placed animal have over the other.
    c. Criticism: why the lower placed animal is in the placing it is.
7. Develop a system of "shorthand" that will help you take notes simply and fast.

Step 2 - Reasons Format

Once you have taken notes on a reasons class, the next step is to develop them. The note template will make it easy to apply it to the reasons format. The format used to develop a set of reasons is simple and straight forward and allows for a complete description of a class. This format requires a thorough understanding of livestock evaluation as animals are analyzed in great detail. One must have the ability to recognize important differences and prioritize them.

A class of livestock consists of three pairs: a top, middle and bottom pair. In each pair, there are three basic sections: comparisons, grants and criticisms. The following is a basic outline that demonstrates the reasons format:

1. Introduction to the class I placed the …1-2-3-4 …
    a. Opening Statement "I started the class with…"
    b. Criticism of top animal "I realize 1 was …"
2. Top Pair
    a. Comparison of 1 over 2 "Nevertheless I used 1 over 2"
    b. Grant for 2 over 1 "I recognize that 2 is…"
    c. Criticism of 2
3. Middle Pair
    a. Comparison of 2 over 3
    b. Grant for 3 over 2
    c. Criticism of 3
4. Bottom Pair
    a. Comparison of 3 over 4
    b. Grant for 4 over 3 (if necessary)

      c.   Criticism of 4

The type of terminology used in each section of the reasons format is important. In the opening statement on the top animal you may either use descriptive terms or class comparisons. In the pair comparisons you may either use class comparisons (words ending with –est, like heaviest muscled or widest based) or simple comparative terms (words ending with –er, heavier muscled, leaner made).

Grants are comparative terms or class comparisons used to admit that there are some valuable characteristics in the animal though they are placed under another animal.

Criticisms are descriptive or class comparisons that give the reason why an animal is placed below another. Terms used to describe each specie and their use is unique. Make sure to use the specie appropriate terminology to compare and contrast the animals.

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

Step 3 - Transitions

Transitions are simple ways 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.

Moving Into a Pair

When moving into a pair, you should not be repetitive in the terms you use. A good idea is to choose three different transition phrases that you can use in every set. Transitions can also be used to illustrate whether the decision was easy or difficult or whether a specific trait or traits allowed you to use one animal over another.

Still   *Nonetheless*   *Nevertheless*   *Yet*   *But*   *However*

Examples of transition use:
- Still, in the top pair I used 1 over 2…
- Nonetheless, in the middle pair, it's 2 over 3…
- Nevertheless, in the bottom pair, I used 3 over 4
- Yet, I easily used/placed 1 over 2 in the top pair…
- But in a more challenging middle pair, it's 2 over 3…
- However, 3 must go over 4 in the bottom pair…
- But it's 1's balance, femininity and style that places her over 2 in the top pair…

Moving into Grants

Grants are used to show that an animal may have some good or better traits over an animal that is placed above them. Like transition phrases, choose three different grant words to use in every set so that you do say the same word three times. Here are some simple words to use when moving into a grant:

Grant	***Concede***	***Recognize***	***Admit***	***Realize***

Examples of grant use:
- I realize that 2 is more…
- I concede that 1 is…
- I recognize that 3 is better…
- When you have mastered this, you may not even need to use a phrase to move into a grant at all.
- 2 is straighter lined and cleaner fronted, but he is… (move into criticisms)

Moving Into Criticisms

Criticisms are used to explain the less desirable traits of an animal and why they are placed below another animal. Again, choose several different criticism terms to use in your set of reasons for variety.

Examples of transitions into a criticism:
- But, 1 was …. and so he is second.
- However, I criticized 2 and left her third as she was…
- Yet, I faulted 3 a
- 1 was simply … so she is third.

Reason's Tips and Teaching Suggestions

Convincing a novice student to present oral reasons for the first time can be a difficult task. The following suggestions may provide some guidelines for development:

1. Make sure students understand the basic format. A video or audio demonstrational tape is a great teacher.
2. Teach the students to take notes in such a way that oral reasons preparation is relatively easy.
3. Prepare well structured questions for the classes. This allows the students to gain confidence in their observational skills. The questions should reflect the items that would be covered in oral reasons
4. Reasons are scored on accuracy, order of priority, presentation and detail. Accuracy and order of priority are the most important.

5. Encourage students to develop mock sets, simply to enhance their command of terminology and speaking ability.
6. Reasons are far more conversational; and controlled than in the past. It is not necessary to shout.
7. It is not necessary for the reasons to be long and wordy in order to receive a good score. Elaborate on major differences. Do not concentrate on minor points.
8. Develop methods to test the ability of students to actually picture the animals as opposed to memorizing notes.

Fill in the Blank Reasons Format

Below is a novice, fill in the blank reasons format. Using the transition phrases and terms from above, develop your own, personalized reasons format!

I placed the _____ - - - . I started the class with ____

as he/she excelled the class in _____.

Yes, ____ could be _____.

Yet, I preferred ____ over ____ in my top pair. ____ was _____

_____. I realize that ____ was _____

_____, but I faulted ____ and left him/her second as

he/she was _____.

However, in my middle pair, I placed ____ over ____. ____ was _____

_____. I admit that ____ was _____

_____, but I criticized ____ and left him/her third as he/she was ___

_____.

Still in my bottom pair, it's ____ over ____. ____ was _____

_____. I grant ____ was _____

but he/she was the _____ and

so I left him/her last.

Overview of Livestock Terminology

Terms used to describe livestock can be broken up into several categories. Market and breeding (often paired with performance data) refers to the purpose of the animals in the judging class (i.e. market hogs, breeding gilts). The purpose of the animal will dictate the emphasis placed on the major characteristics in the image below.

Each of the species specific sections in this manual are designed to give you ideas about terminology to help you describe animals accurately and creatively.

NOTES
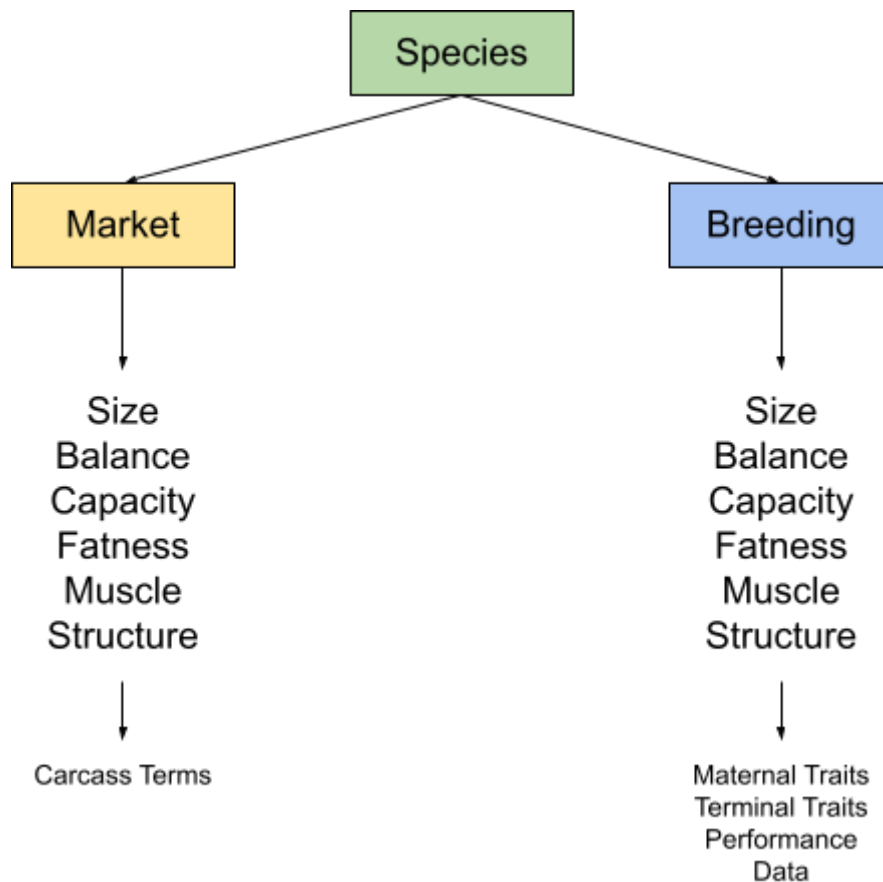
Evaluating Beef Cattle
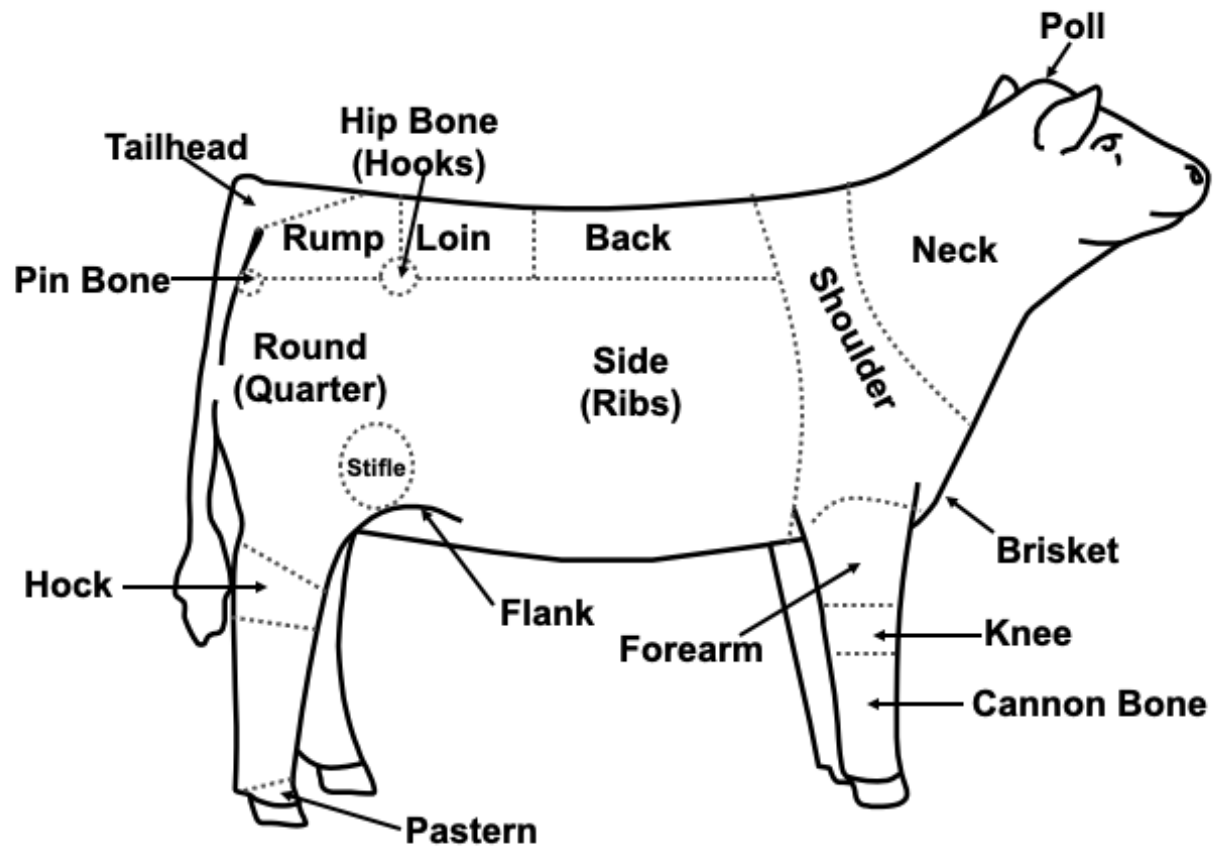
Balance

POSITIVES	NEGATIVES
Nice balanced	Plainer made
Attractive profiling	Poorer balanced
Cleaner patterned	Coarse/open shouldered
Straighter made	Weak topped
Eye appealing	Off balanced
Straighter lined	Deep chested
Nicest profiling	Rolls of in her hip
Attractive look	Heavy fronted
Striking from the profile	Steep hipped
Nice patterned	Easy topped
Strong topped	Short hipped
Correct tailhead set	Drops pins
Stylish	Course tail head
Longer and leveler hipped	Off in his/her hip
Smoother shouldered	
Flatter shouldered	
Cleaner necked	
Longer necked	
More youthful about her front end	
Blends neater from his shoulder into his forib	
More correct in his/her topline	

Volume

POSITIVES	NEGATIVES
Deeper ribbed, softer flanked	Shallow bodied
Deep bodied	Tight hearted
Bigger bodied	Harsh rib
Roomier middle	Tight rib
More uniform in her body depth	Shallow heart and flank
Built functionally wider at the ground	Flat ribbed
Leaves me especially wider at the ground	Light dimensioned
Wider from hooks back and pins down	Narrow made
Deeper flanked	Shallower flanked
Bolder sprung	Narrow gauged
Deep sided	Frailer made
Internal dimension	Shallower ribbed
Opens wider in her fore rib	Harder doing
Deeper hearted	Narrow pinned
Bolder sprung	
More maternal rib (heifers)	
Softer bodied	
Broodier center body	
More shape to rib	

Structure

POSITIVES	NEGATIVES
Sounder moving	Poor structured
Flex to hock and pastern	Course jointed
Bigger footed	Fragile structured
Longer, truer stride	Weak pasterned
Wider based	Tentative rear leg travel
More correct on hock and pastern	Tight Structured
More correctly set from hock to ground	Toes in
More comfortable at the ground	Straight shouldered
More cushion to heel	Coarse shouldered
Travels with more comfort and stability	Over in his/her knee
More functional stride	Knuckles her/his pasterns
Studies more correct in his/her angles	Tracks underneath himself
Easier moving	General in the set his/her hock
Toes ahead more correctly	Upright pastern
Tight pastern	

Movement

When traveled…
On the lead…
On the move…
Travels with…
Leads out with…
When asked to lead…

Example Set of Breeding Heifer Reasons

Commercial Heifers

My alignment of the commercial heifers is 2314. There's a powerful yet functional made heifer to start and it's these brood cow fundamentals combined with a high quality look that makes her the logical handle. The white bellied heifer is extended, smooth made, soft and productive in her rib while being the levelest out thru her hip and she further highlights her correct build with being the most comfortable on the move. Now the scurred heifer who leads out in 2nd most closely reflects my class winner's body type and fleshing ability but I see her as shorter fronted, bolder shouldered female who wants to round in her hip and close at the ground.

Now I get critical of her but in this line up she easily brings more maternal value to my remaining trio and I write the middle 3 over 1. She's just the more moderate sized, bigger bodied female who works off a more functional hip and hind leg allowing her to take the longer, softer stride. Collectively, I would anticipate her to be easier to maintain as a mature cow. Sure, the blue roan heifer is growthy and from behind gives me a stout view but it's from the side I get disappointed. She's harsh about her rib, tight in her flank and wants to duck her pins and pull her rear two underneath herself on the move.

Even though I am not fond of 1's kind I am still more comfortable to use her performance and power to beat 4 in my bottom. To keep it brief, she's just the wider constructed female who's built on more foot and bone while additionally is more opened up in her rib and wider out of her hip. Now the black heifer who closes is a structural improvement out of her rear skeleton and it's not her functionality I question she just needs to come with more genuine power and base width to drive up her replacement value as she's low performing, flat made and narrow based so she's a distant 4th.

Fatness (Market Steers)

POSITIVES	NEGATIVES
More correctly finished steer	Barer handling
Fresher finished, nicer handling steer	Patchy in his cover
Closer to his terminal end point	Variable in his cover
Uniform in his finish	Thin finished
More consistent in his cover	Lowest cutability
More desirable in his degree of finish	Excessively finished
Mellower handling	Softest handling
More evidence of finish through his visual reference points	Least desirable yield grade
Handled with more cover	Pushes the limit on yield
Compositionally correct	Inconsistent in his finish
Appears to be the more market ready steer	Needs more days on feed
Appears to be more advanced in his finish	Stale Appearing
Fresher appearing steer	

Muscle (Market Steers)

POSITIVES	**NEGATIVES**
Heavier muscled	Lighter muscled
More expressively muscled	Flat quartered
Thicker topped	Narrow topped
More natural thickness	Tapers into his quarter
Wider topped	Flat stifle
Shape to his quarter	Tightest ribbed
Shape and turn to his top	Shallowest twisted
Greater volume of muscle	Narrow-made
Deeper twisted steer who has more turn to his quarter	
Comes out of his shoulder with more turn to his top	
Wider built	
Thick ended	
Came out of his shoulder with a more distinct turn to his top	
Stout hipped	
Powerful constructed	

Handling Terms

POSITIVES	NEGATIVES
Handled with more shape over his loin	Sharp top
Handled more uniform in his degree of finish	Flat loin
Firmer, more muscular steer to the touch	Least shape to his top
Came out of his shoulder into a more muscular top	Softest handling
Handled with more shape and expression over his loin	Barest over his ribs
	Handled patchy over his rib

Carcass Terms

POSITIVES	NEGATIVES
Should hang a carcass more likely to grade choice	Less likely to grade choice
Should hang with a lower numerical yield grade	Lower cutability carcass
Should be more apt to capture quality based incentives	Question his ability to grade
Higher cutability carcass	Rail the most trim
Heavier muscled carcass with a more desirable yield grade	
Should roll the choice stamp	
Should push higher into the choice category	
Safer into the choice grade	
Should cut with a the larger eye	
Should rib the larger eye and end with a lower numerical yield grade	

Should hang with more lbs of product

Has the ability to generate a premium in today's grid and formula system

He handles with a higher degree of finish over his 12th and 13th rib and should have a greater chance to reach the choice grade

If genetics allow I'd expect him to be more apt to grade and ultimately better capitalize on today's choice-select spread come closeout

Should rail a heavier muscled carcass

Safer grading

Terminally speaking…..

Carcass wise…..

Quality and Yield Grades

Quality and yield grades measure the quality of the eating experience and determine the profit to the cattleman. It is important to understand how beef carcasses are graded so that you can understand how market steers are judged.

Quality Grade

Quality grades reflect the flavor and tenderness of meat and are primarily determined from carcass maturity and the amount of fat within the meat (i.e. marbling or intramuscular fat). The USDA quality grades are:

> USDA Prime
> USDA Choice
> USDA Select
> USDA Standard

Within a maturity group, marbling (the amount and distribution of intramuscular fat) within the ribeye is the primary determinant of USDA Quality Grade. Visual evaluation of marbling in the ribeye (at the 12th rib cross-section) are related to differences in eating quality of beef. Beef cuts with high levels of marbling are more likely to be tender, juicy and flavorful than the cuts with very low levels of marbling. Studies suggest that beef from carcasses grading at least USDA Select are likely to be acceptable in eating quality for most consumers. The table below shows the USDA quality grades (QG) and the degree of marbling and corresponding percentage of intramuscular fat (IMF).

USDA QG	Marbling Score	Percentage IMF
Prime+	Abundant$^{0-100}$	11% and above
Prime°	Moderately Abundant$^{0-100}$	9.5-11%
Prime-	Slightly Abundant$^{0-100}$	8-9.5%
Choice+	Moderate$^{0-100}$	7-8%
Choiceo	Modest$^{0-100}$	5-6%
Choice-	Small$^{0-100}$	4-5%
Select+	Slight$^{50-100}$	3.5-4%
Select-	Slight$^{0-50}$	3-3.5%
Standard+	Traces	2.5-3%
Standard-	Practically Devoid	Less than 2.5%

Yield Grades

Yield Grades- estimate the amount of boneless, closely trimmed retail cuts (BCTRC) from the high-value parts of the carcass--the round, loin, rib, and chuck. However, they also show differences in the total yield of retail cuts. We expect a YG 1 carcass to have the highest percentage of boneless, closely trimmed retail cuts, or higher cutability, while a YG 5 carcass would have the lowest percentage of boneless, closely trimmed retail cuts, or the lowest cutability. The USDA Yield Grades are rated numerically and are 1, 2, 3, 4, and 5. Yield Grade 1 denotes the highest yielding carcass and Yield Grade 5, the lowest.

Meat graders assign a yield grade to a carcass by evaluating:
1. Amount of external fat;
2. Hot carcass weight;
3. Amount of kidney, pelvic, and heart fat; and
4. Area of the ribeye muscle.

Graders evaluate the amount of external fat at the 12th rib by measuring the thickness of fat three-fourths the length of the ribeye from the chine. They adjust this measurement to reflect unusual amounts of fat in other areas of the carcass. Only graders highly skilled in evaluating cutability of beef carcasses make these adjustments according to whether the measured fat thickness is representative of the fat coverage over the rest of the carcass. Carcass weight is the "hot" or unchilled weight in pounds (taken on the slaughter-dressing floor shortly after

slaughter). The grader usually writes this weight on a tag or stamps it on the carcass. The amount of kidney, pelvic, and heart (KPH) fat is evaluated subjectively and is expressed as a percentage of the carcass weight (this usually will be from 2 to 4 percent of carcass weight). The area of the ribeye is determined by measuring the size (in inches, using a dot-grid) of the ribeye muscle at the 12th rib.

The table below shows the expected percentage of boneless, closely trimmed retail cuts from beef carcasses within the various yield grades

Yield Grade	% BCTRC
1	> 52.3%
2	52.3 - 50.0%
3	50.0 - 47.7%
4	47.7 - 45.4%
5	< 45.4%

Example Set of Market Steer Reasons

Market Steers

John Gladman - American Royal 2011

There's one calf who goes unmatched in his unique combination of power and balance and I sorted the market steers 1423. In my mind, the white socked steer handily wins not only is he the stoutest made and offers the most genuine shape right behind his shoulder but he powers this back into the biggest hip and is still surprisingly well balanced and sound made. Now, the steer on the opposite end is another stout made big bodied option unfortunately he is bolder shouldered and patchier in his handle I like him second.

But I never considered moving him any further down, it only makes sense to use his advantages in market animal basics versus 2. He offers more shape down his top, presents the more impressive rear view and is particularly more dimensional through his stifle and I'd expect him to harvest with more square inches of rib eye per hundred pounds. Sure, the white flanked calf is attractive on the profile, he is flatter shouldered and more extended up front, unfortunately when I get behind him he disappoints me he comes narrow out of his shoulder and down his top and if you read him through the hair he tapers to his stifle and this is what makes the bottom pair closer.

But I'll stick to my first impression and use his advantages in balance and correctness versus 3, he is neater up front and made with a more ideal angle from his stifle into his hock and down into his pastern on the standstill and when asked to lead, takes a longer freer stride. No doubt the Charolais influenced calf is more carcass oriented and I would expect the heavier muscled option to offer the lower numerical yield grade unfortunately he is the most ill made, poorest structured option who pops in his hock on the move and pushes too much weight up through his chuck and plate, I like him fourth.

Breeding Cattle

There are numerous breeds and environments for breeding cattle. Often, breeding cattle classes will be paired with performance data that explain what breeds the animal will be mated to, what the environmental conditions are for feed and labor and how the animals will be marketed. It is important to understand these elements in order to place breeding cattle classes appropriately to their form and function. Below are some breeding cattle terms, a summary of the maternal and terminal beef breeds, explanations of Expected Progeny Differences and examples of performance data.

Heifers

POSITIVES	NEGATIVES
More feminine through neck and shoulder	Coarse fronted
More angular	Short necked
More angular through front end	Round shouldered
Cleaner, longer necked	Heavy fronted
Sharper fronted	Coarse made
More attractive, eye catching profile	Coarse uddered
Feminine featured	
Refined and correct in teat placement	
More brood cow potential	
Functionally designed	
Commercially oriented	
Commercially oriented	
More evidence of fleshing ability	
Industry useful	
Production oriented	
Lower maintenance	

Bulls

POSITIVES	NEGATIVES
More rugged appearing	Refined
More masculine	Smaller testicled
Bigger testicled	Loose sheath
Tighter sheath	Twisted testicled
Twisted testicled	
More powerfully constructed	
Herd sire prospect	
Industry useful	
Production oriented	
Larger testicles	
More advanced in his testicular development	
Cleaner sheath/ more correct angle to his sheath	

Maternal vs. Terminal Breeds

Maternal breeds of cattle generally bred and used for their maternal ability (milk and calving ease) and are also known as British Breeds. British breeds are breeds that were developed in the British Isles and were brought to the United States in the late 1700s through the late 1800s. Angus (Black and Red), Hereford (Horned and Polled), and Shorthorn are the primary British breeds. When compared to Continental European breeds, British breeds are generally smaller in mature size, reach mature size at an earlier age, have less growth potential, excel in fertility and calving ease, attain higher quality grades, and yield carcasses with a lower percentage of saleable product. Terminal breeds are known for their carcass traits and are also known as Continental Breeds. Continental European breeds are also commonly referred to as "exotic" breeds and include Charolais, Chianina, Gelbvieh, Limousin, Maine Anjou, Salers, and Simmental. The majority of these breeds are relatively new to the U.S., being imported in the late 1960's and early 1970's primarily to improve the growth rate and leanness of existing breeds. In comparison to British breeds, Continental European breeds are generally larger in mature size, later maturing (reach mature size at an older age), produce

carcasses with less fat and a higher percentage of saleable product, have lower quality grades, and produce more calving difficulty when mated to cows of the British breeds.

Angus
Angus are solid black in color but a small amount of white is permitted on the underline, behind the navel scar. Angus are moderate-sized, muscular animals, renowned as a carcass breed. They are used widely in crossbreeding to improve carcass quality and milking ability.

Brahman
Brahmans are characterized by a hump above the shoulders and a pronounced dewlap. The coat is short and can be light to dark grey, various shades of red, or black. They show typical Bos indicus characteristics of shielded eyes, loose folds of skin on the dewlap and prepuce, and droopy ears. The breed is medium in size with a tendency to later maturity, so carcasses of young animals tend to be lean.

Brangus
Brangus cattle are black or red, polled, with a sleek coat and pigmented skin. Their ears are medium to large and the skin is loose, with neck folds. The rump is slightly rounded, and the bulls have a moderate hump. The Brangus is a good forager, and the cows make excellent mothers with an ample supply of milk. Other features claimed are rapid weight gains, average to slightly late maturing, and a carcass without excessive fat.

Charolais
Breed color varies from white to a light straw. They are large-framed animals, long-bodied, heavily muscled and late-maturing. Most Charolais are horned, though some polled animals are now being bred. Steers produced on good pasture yield heavy, well-muscled, fine-textured, though lean, carcasses.

Chianina
They have a short, smooth, white or grey coat, and a skin pigmentation that is primarily black (including a black tongue, palate, nose, eye area and switch. Chianinas are very tall and long, with long smooth muscling and excellent growth rates. The Chianina breed has an unsurpassed capacity for lean meat production. The meat is red and is free from waste but still retains a marbling of fat among the muscling. They are renowned for their large eye muscle.

Gelbvieh
The Gelbvieh breed is a medium-sized, maternal, European breed. It generally has a short coat, and ranges in color from black to honey (which may be dark or light). Gelbviehs are being used increasingly (due to hybrid vigor) as a part of cross-breeding programs, to improve maternal performances, weaning marketability and carcass quality.

Hereford- The Hereford color is characteristic, with the body color varying from rust brown to a deep rich red. Face, crest, dewlap, underline, switch and legs below the hocks are characteristically white. The distinctive white face tends to dominate in crosses with all other

breeds and may have been a feature in establishing the breed's popularity. Depending on the level of nutrition and management, the breed can be produced as top-quality carcasses ranging from heavy, marbled and fat, through to small, young and lightly finished.

Limousin
The Limousin is a rich gold color, with lighter circles around the eyes and muzzle, and shading to a lighter color on the legs. The skin is free of pigmentation. The head is small and short with a broad forehead, and the neck is short. Horns are yellow at the base and darken towards the tips; they are at first horizontal, then curve forwards and upwards. Features of the breed are its hardiness, regular breeding, easy calving, good milking qualities, fast growth and the production of exceptionally high yielding carcasses with little fat.

Maine-Anjou
Their coloring is dark red and white, with the head always predominantly red and the eyes always surrounded by red coloring. The breed is noted for its rapid growth and weight gain, is late maturing, and produces a high proportion of well-marbled muscle with a minimum of fat cover and a large rib-eye area.

Shorthorn
Shorthorns are a distinctive red, white or roan in color, and can be polled or horned. They have high fertility and good mothering ability, and generally have a docile temperament. They finish readily on good quality pastures and are noted for their good marbling characteristics when finished on grain.

Simmental
Simmentals vary from yellowish brown to straw color to dark red, with white markings on the head, brisket, belly and legs. They often have red pigmentation around the eyes, and white patches on the body, especially behind the shoulders and on the flanks. Simmentals are well-muscled animals, being long and deep-bodied with strong bone. They have good temperament and high milk production. Simmental carcasses are significantly heavier and leaner than other European breeds, with little waste, and they give a higher yield of saleable meat.

Expected Progeny Differences

Expected Progeny Differences or EPD's are values that are statistically calculated and reflex the expected difference in performance of a bull's progeny (offspring) when compared to the average progeny performances of all bulls evaluated for a given time period. EPD's are based on the actual progeny performance and on performance information of the individual and his relatives. (sire, dam, etc.)

Belows are common terms a livestock judge will come across:

ACC(Accuracy) - An expression of reliability of the EPD. Accuracy ranges from 0.0 to 0.59 are considered low, 0.60 to 0.79 are medium, and0.80 to 1.00 are highly reliable.

P,PE (Pedigree Estimate) - Indicates that the EPD is only an estimate based upon the performance information of an animals sire and dam.

PE+ - The same as PE, however the individual's own performance record for that trait is included in the
estimate.

BW EPD (Birth Weight) - The birth weight of a bull's progeny expressed in pounds.

WW EPD (Weaning Weight) - The adjusted weaning weights of a bull's progeny and is expressed in pounds. This is the best estimate of pre-weaning growth. (7 months)

YW EPD(Yearling Weight) - The adjusted yearling weights of a bull's progeny and is expressed in pounds. This is the best estimate of growth through 1 year of age.

Milk EPD - The amount of pre-weaning gain by calves that can be attributed to the milking ability of a bull's daughters and is expressed in pounds of calf.

MWW EPD (Maternal Weaning Weight) - The weaning weight of a bull's daughter's calves and is expressed in pounds. This evaluation represents both the milking ability of a bull's daughters and the growth potential of their calves.

GL (Gestation length - Gelbvieh breed only) - The number of days from breeding to calving for a bull's progeny and is expressed in number of days above or below the average.

CED (Calving Ease Direct) - For the Gelbvieh breed, this is a measure of the ease with which a bull's calves are born from first calf heifers and is expressed as a ratio with those above 100 being more easily born. For the Simmental breed, this EPD is available for heifers (H) and cows (C) and is expressed in the percent of unassisted births with positive EPD's indicating greater calving ease.

DCE or CE Maternal (Daughter Calving Ease/Calving Ease Maternal) - The ease with which a bull's daughters calve as first calf heifers and is expressed as a ratio with those above 100 indicating greater calving ease.

Scrotal Circumference (SC) - Scrotal circumference EPD values predict the difference in yearling scrotal circumference (measured in centimeters) of a bull's male calves compared to male calves of all other bulls evaluated.

Homozygous Polled - These bulls have been proven to produce all polled calves. They have been mated to horned and heterozygous polled cows and have produced all polled calves. If a bull is bred to 10 horned cows and produces all polled calves, he is said to have a 99.9% probability of being homozygous polled.

Homozygous Black - These are bulls that have proven to produce all black bodied or black factored bodied progeny. The spotting gene, which is a separate gene, is responsible for the white color in the face, feet, tails, underline, etc. A homozygous black bull, therefore, may sire black or black factored progeny that have white on their face, feet, or underline but do have a black or black factored body color. Homozygous black bulls should produce black of black factored progeny when bred to black, black factored, red, or yellow females.

Ultrasound Ribeye Area (UREA) - A predictor of the difference in square inches of ribeye area for a sire's progeny compared to an average sire.

Ultrasound Back Fat (UFAT) - It is expressed in inches and is a predictor of the difference in external fat thickness at the 12-13th rib of a sire's progeny compared to an average sire.

Carcass Weight (CW) - Carcass weight is a good predictor of total retail product, but not percent retail product. Selecting sires with higher EPD values for carcass weight will result in progeny carcasses with more total retail product at a constant fat and age endpoint. The industry target weight range for carcasses is 650 to 850 pounds.

Marbling Score - The marbling score EPD can be used to select sires that will produce progeny with more marbling at a constant fat or age endpoint. The genetic correlation between marbling score and external back fat at the 12th rib is nearly zero. Intramuscular marbling contributes to the overall eating experience of beef. Intramuscular fat plays a small role in tenderness of beef. It also is a significant component of juiciness and flavor of the beef product.

Rib Eye Area (REA) - expressed in square inches, is a predictor of the difference in ribeye area of progeny at a given end point.

Fat Thickness (FAT) - The heritability of 12th-rib fat thickness has been estimated to be 0.25 from the Angus carcass database. According to research from MARC, there is a high negative genetic relationship (-.74) between external 12th rib fat thickness and percent retail product. From field data this correlation has been estimated at -.84, but it must be remembered that the

% retail product used for the sire evaluation is made up of component traits of which fat thickness is the biggest contributor.

Percent Retail Cuts (%RP) - An estimate of the yield of closely trimmed, boneless retail cuts from the round, loin, rib and chuck. Selecting sires with higher EPD values for percent retail cuts will result in progeny carcasses with a higher percentage of closely trimmed retail product at a constant age. Can also be measured and estimated by using carcass ultrasound, designated %URP.

Performance Data (Scenario) Statements

Growth

If she breeds true to her growth figures…
When comparably mated…
…should produce faster growing sons.
…progeny should experience more feedlot gain.
…progeny should be heavier at weaning and a year of age.
…progeny should cross the scales heavier at both weight periods.
…offers more growth to the operation.
…sons would be more marketable to commercial cattlemen looking for growth sires.

Milk

…should produce or sire heavier milking daughters.
…daughters would wean off more pounds of calf due to milk.
…inject or contribute more milk.
…she would be better suited to this limited feed scenario due to her lower milk values.

Birth Weight

He would be better suited to the smaller cows and heifers in this operation.
She could be mated to a wider array of bulls due to her lower more flexible BW value.
…better suited to this limited labor operation
…more confident choice on heifers.

Carcass Traits

…sons would be more marketable to commercial cattlemen looking to enhance quality grade.
I would expect a higher percentage off his offspring to meet the average choice requirement of CAB.
…should sire higher cutability offspring.
His offspring would be better suited to this yield based marketing system.

Phenotype

…offspring would spark more buyer interest at state and national sales.
…offspring should be more competitive in the showring.
If he breeds true to his kind I would expect his offspring to more merchandisable as 4-H and youth projects.

Example Sets of Performance Breeding Cattle Reasons

Performance Lim-Flex Bulls

Haydn Clement - American Royal 2011

I quickly found the highest indexing option who is the most complimentary breeding piece, and placed the Lim-Flex bulls 1243. I expect 1 to produce the highest quality progeny regardless of which side of the scenario, because he is a ruggedly designed deep bodied bull who is bolder in his upper rib shape, setting the foundation for more genuine topside muscle while generating more power out of his hip. I appreciate that 2's data suggests that his calves should come lighter and gain quicker, more drastically bending the growth curve. But it is quick to see he is simply shorter-hipped and easily overpowered, he is second.

Nevertheless he is still a more complete option in the middle pair over 4. 2 offers more female generating potential as he blends a smoother shoulder more seamlessly into a more expansive fore rib. I'll admit 4 is certainly youthful in his appearance and a complete, functionally sound bull, but he is a little easier behind his shoulder, flatter in his upper rib, he is 3rd.

But he is still a sounder, more compositionally correct option over 3 in the bottom pair. The flatter shouldered bull comes back leveler to his hip and works down with a more correct set of angles, allowing him to take a more comfortable stride when set to lead. Sure, 3 is the low birth weight bull who should have the greatest chance of injecting carcass quality into his terminal progeny. Unfortunately he is too slow growing on paper, bold shouldered and flat ribbed. The bull who presents the most structural problems is last.

NOTES

NOTES

Evaluating Sheep

Dock

Hindsaddle

Top of Shoulder

Neck

Rump | **Loin** | **Rack**

Side | **Shoulder**

Leg

Stifle

Twist
(Between hind legs)

Breast

Flanks
(Fore and Rear)

Hock

Forearm

Knee

Cannon Bone

Pastern
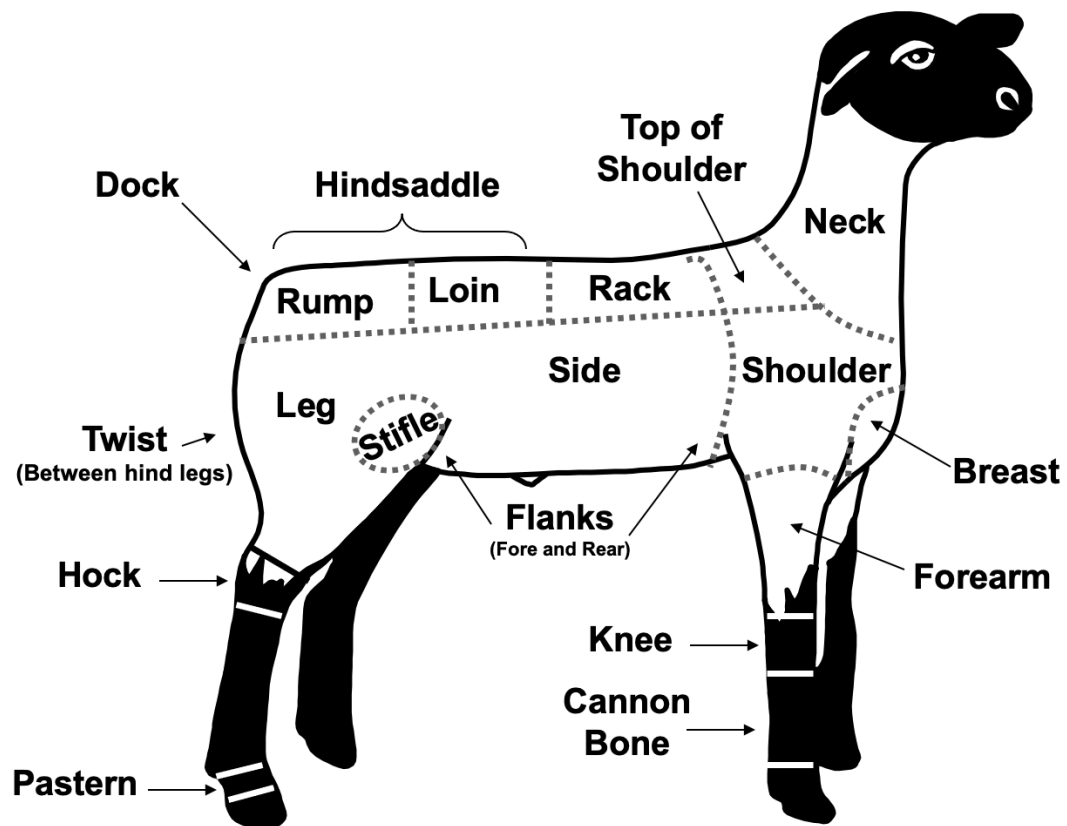
Sheep General Terminology (market and breeding)

Size

POSITIVES	NEGATIVES
Longer bodied	Shorter bodied
Bigger framed	Early maturing
Extended	Compact
Longer hindsaddled	Shorter hindsaddled
Growthy	Small framed
Large outlined	Quick patterned
More skeletally extended	Pounds lighter
Larger patterned	Shorter patterned
Longer profiling	Low fronted
More upstanding	Short necked
Taller fronted	
Longer necked	

Example Statements:

She's a larger outline ewe that stands taller at the point of her shoulder and is more extended in pattern
She's a larger patterned ewe that is longer profiling and more extended out her hip

Balance

POSITIVES	NEGATIVES
More attractive profiling/designed	Plain
Nicer balanced	Coarser made
Cleaner lined	Bolder shouldered
Cleaner shouldered	Opens up in the shoulder
Up headed	Down headed
More elevation about head and neck	Shorter necked
Cleaner fronted	Coarser fronted
Neater fronted	Heavy chested
Blends neater from neck into shoulder	Washed out behind
More correctly designed at her neck and shoulder	Steep to dock
More attractive about her front end	Sloped to dock
Stronger topped	Weaker topped
Leveler to dock	U-necked
Squarer docked	Deep fronted
Leveler, longer through hindsaddle	
Elegant fronted	
Catches your eye from the profile	

Example Statements:
She's more attractive in her lines as she higher headed, longer necked, straighter topped and leveler out her hip
She's more stylish in her pattern, as she blends smoother at her neck and shoulder junction, is leveler down her top and squarer out her hip
She's a higher quality female that is more attractive about her front end, is longer in her pattern and straighter in her lines

Volume

POSITIVES	**NEGATIVES**
More outward upper rib shape	Flat in upper rib shape
More spring of rib	Tight hearted
Wider based	Narrower based
Wider chested	Narrower chested
More opened up in chest	Narrow gauged
Naturally thicker made	Tight ribbed
Bolder spring	Flat ribbed
Rounder in her rib	Light dimensioned

Example Statements:

She's a bolder sprung, naturally thicker made ewe that leaves me especially wider at the ground.

……has the most depth and shape to her rib and maintains this advantage out through her hip and sets down on the widest foundation.

Structure

POSITIVES	**NEGATIVES**
Heavy boned	Frail boned
Big footed	Small footed
Wide based	Narrow based
Truer moving	Narrow tracking
Wider tracking	Splay footed
Shorter, stronger pasterned	Too soft on her rear leg
More correct set to her feet and legs	Weak pasterned
Moves sounder and stronger on his hock and pasterns	Toes out up front

Leaves me with a squarer track	Over in knee
Longer striding	Hocks in as he leaves me
Easier traveling	More set to her pastern

Example Statements:
…takes a longer freer stride off both ends.
…holds herself together more correctly when on the move.
…more ideal in the set and travel of her rear leg.
Holds himself together more correctly at the stand (market lamb).

Market Lamb Terminology

Trimness

POSITIVES	NEGATIVES
Firmer, fresher handling	Softer handling
More uniformed in finish over rack	Stale handling
More correctly finished	Patchy finished
More touch and tone down his top	Bare handling
More uniform in his handling from his first rib back	Heavy finished
Higher cutability	Excessive in his finish
Deep chested	Pelty hided
Trimmer patterned	Wrinkly hided
Shallower chested	

Muscle

POSITIVES	NEGATIVES
Stouter, more powerfully muscled lamb	Lighter dimension
Bolder racked	Plainer
More turn to his loin edge	Nondescript in muscle
Fuller through his leg shape	Flat in rack shape
Heavier muscled	Lighter muscled
Bolder forearm	Narrower topped
Wider, squarer rack	Pinched in rack
Wider and thicker down his top	Narrow loined
Wider across his loin	Tapers in his dock
Longer loined	Longer loined
Wider across hip and hindsaddle	Short loined
More powerful in upper hip	Breaks in her loin
Handles with more lower leg	Flatter lower leg
More inner and outer leg muscle	Shallow through her twist
Wraps more product from his outer leg into his twist	More cut up in his twist
Meatier leg	Short hip
More natural thickness down her top	Wasty through her twist
More hydrated in his loin	

Handling (market lambs)

POSITIVES	NEGATIVES
Fresher handling	Softer handling
Firmer handling	Handles narrowed topped
Met my hand with a bolder rack	Handles the flattest
Set higher and more correct about his loin edges	Disappointing upon handle
Handles with more tone and shape down his top	
Leaner to the touch	
Handles trimmer over his rib	

Carcass (market lambs)

POSITIVES	NEGATIVES
Should hang a heavier muscled carcass	Lighter muscled carcass
Shapelier carcass	Less shapely carcass
Greater percentage of leg and loin	Lower cutability
Meatier carcass	Wastier carcass
Higher percentage of hindsaddle	
Yield more total pounds of preferred cuts	
More correctly finished carcass translating into a longer shelf life	
Should rail a carcass with an advantage in yield grade	
Should rail a more shapely carcass	
Primal yield should be in his favor	

Example Set of Market Lamb Reasons

Market Lambs

The two more compositionally correct, fresher handling lambs sort up, in the market lambs I liked 2-1-3-4. And of the two I liked the one that measures the longest from his thirteenth back. As he's not only longer from flank to flank but he's neater and more driven up through the floor of his chest, his rounder, more youthful rib cage blends smoother into a flatter shoulder and his longer neck ties in higher. Now 1 may present a more powerful view from behind as he's wider at the top of his hip and bolder in his stifle shape but unfortunately the sheep with the shortest hind saddle is deeper through his chest in relation to his rear flank. He opens at the top of his shoulder so he's second.

But yet I preferred him over 3 in a debatable middle decision. 1 is the wider chested sheep that's bolder in his rib shape. His wider framework lays the foundation for more topside muscle, as he handles bolder on the backside of his shoulder and transitions smoother from his loin into his hip. Now, on the other hand, the fungus scarred wether is fresher handling.

The thinner skinned lamb is more athletic in his build as he's neater through his chest in relation to his rear flank with more muscle expression. But he's also flat in his rib shape, narrow chested and breaks at his loin hip junction. But yet it makes sense to use his cut-ability and his freshness advantage to sort him over 4. Simply put he touches fresher over his rack, squarer and more hydrated to the edge of his loin and I predict he should offer the more valuable cuts of lamb with less trim.

Sure the wether to his right is the stoutest structured with the most shag. But he's stale-handling. The sheep that's the most compositionally incorrect handles the plainest. He's inverted in his shape as he progressively gets wider from his hip to his shoulder so, he's fourth.

Breeding Sheep

There are numerous breeds and environments for breeding sheep. Sometimes, breeding sheep classes will be paired with performance data that explain what breeds the animal will be mated to, what the environmental conditions are for feed and labor and how the animals will be marketed. It is important to understand these elements in order to place breeding sheep classes appropriately to their form and function.

Ewes (females)

POSITIVES	NEGATIVES
Broody appearing	Small framed
Largest outlined	Short bodied
Growthier	Plain, common
Straighter lined	Early maturing
Higher volumed	Coarse made
Appear to have a higher weight per day of age	Over conditioned
Later maturing	
More eye appealing	
Taller fronted	
Cleaner shouldered	
Stronger topped	
Fresher conditioned	

Rams (males)

POSITIVES	NEGATIVES
Powerfully made	Common
Stout designed	Light/frail boned
Heavier muscled	Light muscled
Big topped, thick ended	Short bodied

Big testicled   Small testicle

Heavy boned   Twisted testicle

Breeds of Sheep

Hampshire
A large, open faced sheep with ears that are moderate in length, thick, covered with a coarse dark brown or black hair and free from wool. The face should be of good length, dark in color and practically free of wool from the eyes down. An unbroken wool cap should extend from the neck over the forehead. Any wool interfering with vision should be considered serious. Legs below the knee and hock should be relatively free of wool. Hampshire's are known for their meat quality.

Suffolk
The head should be black, hornless, free of wrinkles, and well covered with a thick, fine hair coat. The muzzle should be long, smooth and roman (curved) with a deep jaw that presents incisor teeth that meet the pad. Ears should be long and bell shaped, angling down towards the corner of the mouth. The fleece should be dense, free of dark fiber and not shading into dark hair or wool. Belly should be well covered with wool. Wool should not extend below the knees and hocks. Suffolks add meat products to their offspring.

Rambouillet
Intermediate to large in size and completely white fleeced, Rambouillets are the largest and strongest of the fine-wool sheep; the rams are horned, the ewes hornless. The Rambouillet is known for its superior, long staple, dense, fine wool.

Dorset
There are two phenotypes (each has a registry), both horned and polled, Dorsets are an all white sheep of medium size having good body length and muscle conformation to produce a desirable carcass. The fleece is very white, strong, close and free from dark fiber.

Southdown
Known is a medium to small sized breed with a gray to mouse-brown face and lower legs and is polled (hornless). Southdowns are an early maturing breed with good lambing ability and average milk production.

Performance Data and Estimated Breeding Values

The sheep industry can use a combination of actual performance data and estimated breeding values (EBV). Actual performance data reflects the individual animal's performance whereas EBV's reflect the genetic potential of the animal. These are calculated in a similar manner as EPD's in other species. Refer the the National Sheep Improvement Program (NSIP) for more information on EBV's.

The following descriptions are directly quoted from the NSIP article titled "NSIP EBV Notebook" authored by Dr. David Notter and Dr. Ron Lewis (2018).

The **Birth Weight (BWT) EBV (kg)** estimates direct genetic effects on weight at birth. Positive selection on Birth Weight EBV is anticipated to increase birth weight and have correlated positive effects on early lamb survival, especially in twins and triplets. Negative selection on Birth Weight EBV is anticipated to reduce birth weight and lambing difficulty associated with oversized lambs, especially in singles. Changing birth weights is generally not a primary selection goal. Positive selection may be advantageous in prolific breeds and in flocks where lambing difficulty is not a problem, whereas negative selection may be desirable in less-prolific breeds or flocks with a history of heavy birth weights and associated lambing difficulties. The birth weight EBV is positively correlated with weaning and postweaning body weight EBV. Selection to increase weaning and postweaning weights is anticipated to result in increased birth weights, and negative selection on birth weight EBV will reduce selection responses in weaning and postweaning weights.

The **Maternal Birth Weight (MBWT) EBV (kg)** estimates genetic effects of the ewe on the birth weight of her lambs. This EBV mainly reflects the quality of the uterine environment provided by the ewe and may also be influenced by ewe effects on gestation length. Ewes with positive Maternal Birth Weight EBV provide a favorable uterine environment for lamb development, whereas ewes with negative Maternal Birth Weight EBV provide a more limiting uterine environment. The Maternal Birth Weight EBV will not receive major selection emphasis in most flocks, but positive emphasis on Maternal Birth Weight EBV can be useful in flocks that have had problems with small weak lambs.

The **Weaning Weight (WWT) EBV (kg)** provides an estimate of preweaning growth potential and will likely receive positive selection emphasis in most flocks. In extensively managed flocks with weaning at 90 to 150 days, the Weaning Weight EBV is commonly estimated from preweaning weights taken at 45 to 90 days of age. In such flocks, the true weaning weight is recorded as an early postweaning weight, with genetic differences reflected in the Postweaning Weight EBV.

The **Maternal Weaning Weight (MWWT) EBV (kg**) estimates the genetic effects of the ewe on the weaning weight of her lambs. It can be thought of as a measure of the ewe's merit for mothering ability. This EBV mainly reflects genetic differences in ewe milk production, but other aspects of maternal behavior may also be involved. The Maternal Weaning Weight EBV is derived by evaluating if individual ewes produce lambs that are heavier or lighter than expected based on the weaning weight EBV of the parents. Ewes whose lambs grow faster than predicted are assumed to be better milk producers, whereas ewes whose lambs grow more slowly than predicted are assumed to produce less milk. Selection for high maternal milk EBV is expected to improve milk production and mothering ability and is considered to be important for maternal breeds. The total anticipated genetic contribution of an animal's daughters to lamb weaning weight includes effects on both weaning weight and maternal milk, and can be calculated as:

$$\text{Total Genetic Effect on Weaning Weight} = \text{MWWT EBV} + 0.5 \times \text{WWT EBV}$$

This calculation recognizes that the genetic contribution of a ewe to the weaning weight of her lambs combines effects of her milk production (measured by the Maternal Weaning Weight EBV) and a sample one half of her genes for preweaning growth potential (measured by the Weaning Weight EBV).

The **Postweaning Weight (PWWT) EBV (kg)** combines information on preweaning and postweaning growth to predict genetic merit for postweaning weight at 120 days. Up to two postweaning weights can be recorded: an "early" postweaning weight at 90 to 150 days and a "late" postweaning weight at 150 to 305 days. Either or both can be recorded. These two postweaning weights are assumed to have a genetic correlation of 1.0 and contribute equally to the final Postweaning Weight EBV. In extensively managed flocks with weaning at 90 to 150 days, the weaning weight is commonly recorded as an early postweaning weight, and the Postweaning Weight EBV predicts genetic differences in body weight at typical weaning ages. Positive selection on Postweaning Weight EBV is expected to favor rapid growth to typical market ages.

The **Yearling Weight (YWT) EBV (kg)** estimates growth potential to 12 months of age. Animals with high Yearling Weight EBV exhibit sustained postweaning growth, but ewe lambs with high Yearling Weight EBV are anticipated to have heavier adult body weights and greater maintenance requirements.

The **Hogget Weight (HWT) EBV (kg)** estimates genetic effects on body weight at 18 months of age. Negative selection pressure on Hogget Weight EBV can be used to control adult body weights of breeding ewes, but will limit progress in weaning and postweaning weights. Selection emphasis on Hogget Weight EBV must consider the optimum balance between these competing goals.

The **Fleece Weight (GFW) EBV (%)** is based on greasy fleece weights and estimate the animal's genetic potential for wool production. Fleece weights are stored and analyzed in

kilograms. However, because of the limited range in resulting EBV and potentially large effects of environment, management, and sex on yearling fleece weight, the GFW EBV is reported as a percentage of the mean fleece weight. A GFW EBV of +10 thus indicates that the animal is expected to produce fleeces that are 10% heavier than average.

The **Fiber Diameter (FD) EBV (microns)** estimates genetic merit for fleece quality. Animals with finer, more desirable fleeces have negative fiber diameter EBV, so negative EBV are favored for this trait.

The **Staple Length (SL) EBV (mm)** estimates genetic potential for length of the wool fiber. Positive selection emphasis on Staple length EBV is recommended in flocks that receive premiums for long-staple fleeces or have experienced discounts for fleeces with excessively short staples.

The **Fiber Diameter Coefficient of Variation (FDCV) EBV (%)** estimates genetic merit for fleece uniformity, expressed as the coefficient of variation (CV) among individual wool fibers in a fleece sample. Animals with more uniform fleeces (lower CV) are desired, so negative EBV are favored for this trait.

The **Fiber Curvature (CURV) EBV (° (degree)** predicts genetic differences in crimp frequency. This EBV is based on an OFDA optical measurement of fiber curvature, which is measured in degrees and is a very accurate predictor of crimp. Higher values for curvature indicate broader or bolder crimp. Positive EBV therefore indicate more crimp and, depending on the end-product (knitwear or worsted fabric), may or may not be desirable. Use of Fiber Curvature EBV in breeding programs therefore depends on the requirements, premiums, and discounts applied to your wool.

The **Fat Depth (FAT) EBV (mm)** is an indicator of genetic differences in carcass fatness between the 12th and 13th ribs. It is derived from ultrasonic measurements of fat depth in live animals and adjusted to standard postweaning weight of 110 lb (55 kg) for Terminal and Maternal Wool breeds and a standard yearling weight of 187 lb (85 kg) for Western Range breeds. Animals with negative Fat Depth EBV are expected to produce leaner progeny with lower, more desirable Yield Grades and are generally desirable. However, the emphasis placed on Fat Depth EBV in individual breeding programs will depend on specifications, discounts, and premiums in current markets.

The **Loin Eye Muscle Depth (EMD) EBV (mm)** is an indicator of genetic differences in muscling. It is derived from ultrasonic measurements of loin muscle depth between the 12th and 13th ribs in live animals and adjusted to standard postweaning weight of 110 lb (55 kg) for Terminal and Maternal Wool breeds and a standard yearling weight of 187 lb (85 kg) for Western Range breeds. Animals with positive Loin Eye Muscle Depth EBV are expected to produce offspring with larger loin eyes and are generally desirable. However, the emphasis placed on Loin Eye Muscle Depth EBV in individual breeding programs depends on specifications, discounts, and premiums in current markets.

The **Number of Lambs Born (NLB) EBV (number)** evaluates genetic potential for prolificacy. This EBV is expressed as numbers of lambs born per ewe lambing. Ewes with EBV of +0.10 for Number of Lambs Born are expected to have an average of 0.10 more lambs at each lambing than average ewes, and their daughters are expected to have an average of 0.05 more lambs at each lambing compared to daughters of average ewes. Selection on Number of Lambs Born EBV is expected to increase prolificacy in the flock.

The **Number of Lambs Weaned (NLW) EBV (number)** evaluates combined ewe effects on prolificacy and lamb survival to weaning. The NLW EBV is expressed as numbers of lambs weaned per ewe lambing. Ewes with EBV of +0.10 for Number of Lambs Weaned are expected to wean an average of 0.10 more lambs at each lambing, than average ewes, and their daughters are expected to wean an average of 0.05 more lambs at each lambing compared to daughters of average ewes. Selection on Number of Lambs Weaned EBV is expected to increase weaning rates in the flock.

The **Scrotal Circumference (SC) EBV (cm)** may be used to improve breeding capacity in males and reproductive performance in females. Selection of animals with positive Scrotal Circumference EBV is expected to be most useful in improving reproductive performance in ewe lambs and yearlings via desirable effects on rate of sexual maturation, but may also have small positive effects on numbers of lambs born and weaned by older ewes. Scrotal circumference measurements can be recorded at postweaning, yearling, and hogget ages. However, NSIP currently produces only Postweaning Scrotal Circumference EBV for the relatively early-maturing Maternal Wool Breeds and Postweaning and Yearling Scrotal Circumference EBV for the later-maturing Western Range Breeds.

The **Worm Egg Count (WEC) EBV (%)** evaluates genetic merit for parasite resistance based on worm egg counts recorded at weaning or at early or late postweaning ages. Animals with low Worm Egg Count EBV are expected to have greater parasite resistance, and selection to reduce Worm Egg Count EBV is recommended in areas where internal parasites are a problem. Worm egg counts can also be recorded in yearlings, hoggets, or adult (2-yr-old only) ewes, but these measurements are not currently used to derive EBV. Most research would suggest that postweaning WEC EBV are the most useful genetic indicator of parasite resistance, but studies with Katahdin sheep in the USA have shown that weaning worm egg counts provide useful information on parasite resistance in young lambs. Weaning and postweaning Worm Egg Count EBV are strongly, but not perfectly, correlated and so convey slightly different information on patterns of development of parasite resistance. However, postweaning Worm Egg Count EBV are likely adequate for most selection and marketing purposes.

The **US Western Range Index (%**) was developed by NSIP to improve profitability in Targhee range flocks and is generally applicable to extensively managed Western range flocks with positive emphasis on both lamb and wool production. EBV for the Western Range Index are estimated from Postweaning Weight (PWWT), Maternal Weaning Weight (MWWT), Yearling

Weight (YWT), Yearling Fleece Weight (YGFW), Yearling Fiber Diameter (YFD), and Number of Lambs Born (NLB) EBV as:

$$\text{US Range Index} = 100+(2.20\times\text{PWWT EBV}+0.57\times\text{MWWT EBV} -0.57\times\text{YWT EBV} + 0.14\times\text{YGFW EBV}-0.47\times\text{YFD EBV} +36\times\text{NLB EBV})$$

This index places major positive weight on early growth and ewe prolificacy and modest positive weight on increasing ewe maternal ability, increasing fleece weight, and reducing fiber diameter. Negative emphasis on yearling weight EBV is designed to limit increases in adult ewe weight but, because of the large positive correlation between Weaning Weight and Yearling Weight EBV, is not expected to actually reduce yearling weights. The Number of Lambs Born EBV is used in preference to the Number of Lambs Weaned EBV because of potential bias in Number of Lambs Weaned EBV from predation in Western range flocks.

The **Maternal Indices (%),** specifically the US Hair and US Maternal Wool, combine EBV for various traits into an index designed to maximize pounds of lambs weaned per ewe lambing. With the NSIP/LAMBPLAN procedures, these indices are estimated from EBV for other traits in the Hair and Maternal Wool breeds.

For all Hair breeds, this index is estimated as:
$$\text{US Hair Index}=100+(0.246\times\text{WWT EBV}+2.226\times\text{MWWT EBV}-3.5\times\text{NLB EBV} + 40.6\times \text{NLW EBV})$$

For all Maternal Wool breeds, this index is estimated as:
$$\text{US Maternal Index}=100+(0.583\times\text{WW EBV}+2.639\times\text{MWWT EBV}-3.5\times\text{NLB EBV} + 40.6\times\text{NLW EBV})$$

These Maternal Indices give substantial positive weight to Number of Lambs Weaned, Maternal Weaning Weight, and Weaning Weight EBV. Small negative emphasis on Number of Lambs Born EBV favors ewes that wean large litters without losing any lambs. A ewe that produces twins and weans them both will thus be favored over a ewe that has triplets but weans only two lambs. However, ewes that wean triplets will always have substantially higher index values than ewes that wean twins. Calculation of Maternal Indexes has changed slightly under NSIP/LAMBPLAN procedures, but the basic nature of the indexes in terms of underlying assumptions and expected selection responses in component traits is the same as it was under the original NSIP system.

Carcass Plus was developed in Australia to improve carcass value in Australian markets. Carcass Plus EBV are calculated as:

$$100+(2.33\times\text{WWT EBV}+3.50\times\text{PWWT EBV} +11.40\times\text{PEMD EBV}–4.07\times\text{PFAT EBV})$$

Even though developed for Australian markets, Carcass Plus Index scores provide a reasonable assessment of value for Terminal Sire types in the USA.

Performance/ Scenario Terms

Growth

…should produce faster growing lambs
…should be better suited to the production of commercial rams
…sons would be more sought after by commercial producers looking to enhance growth
…lambs should be heavier at both weight periods

Phenotype

…offspring should be more competitive at state and national shows
…offspring should spark more buyer interest at state and national sales
…if she breeds true to her phenotype I would expect her lams to be more successful as 4-H and youth projects

Example Set of Performance Ewe Reasons

Wether Dams

Amanda Wolf - NWSS 2011

I ranked the performance wether dam ewe's 4-3-2-1. And I found a ewe with the most show wether generating potential to sort up. And in my top pair I marked 4 over 3. 4 is the most dynamic up front in that she's driven up the most through the floor of her chest, is the longest necked, with the highest attachment. She opens up into a deeper rounder rib and progresses back into the widest pin-set. Moreover she's the heaviest muscled and stoutest structured. 3 is similar in her type and kind in that she's a faster growing, big ribbed female. But when I get critical of her it's because her neck set is lower and she's not as powerful from behind so I left her second.
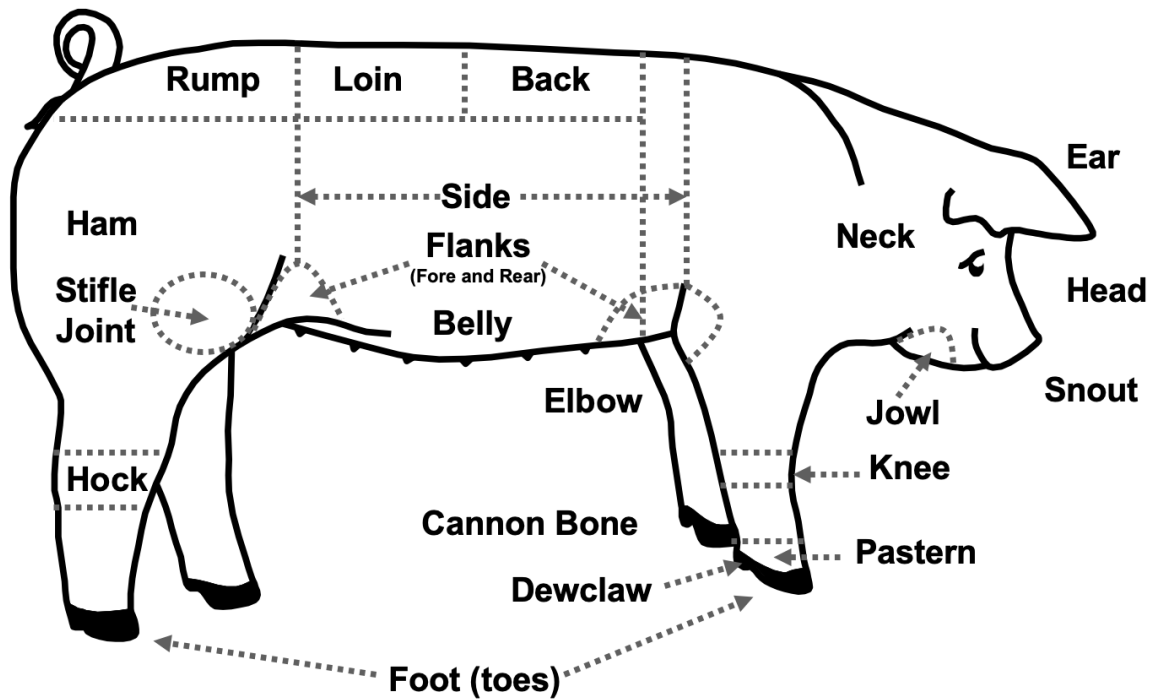
Still in a tougher middle pair I elected to use 3 over 2. Because I know that between the two her progeny will be more likely to be sold in national sales with more of an economical return since her blood work is more favorable. There's no doubt that 2 is deeper sided and she definitely wraps more muscle from her outer leg into her twist, but I cannot overlook the fact that I am not fond of her carrier status and she hocks in the most when on the move so she's third.

Even so in my final pair its easily 2 over 1. The bigger bodied ewe that is heavier muscled should produce wethers that are more valuable when sold for premiums. Yes 1 is feminine in her look but after that the January born single is the tightest ribbed, highest flanked, and she's projected to negate the lamb crop curve so I left her fourth.

NOTES

NOTES

Evaluating Swine

Rump Loin Back

Side

Flanks
(Fore and Rear)

Ham

Stifle
Joint

Belly

Hock

Elbow

Cannon Bone

Dewclaw

Foot (toes)

Neck

Ear

Head

Snout

Jowl

Knee

Pastern

Size

POSITIVES	NEGATIVES
Powerfully made	Shorter bodied
Stout designed	Light/frail boned
Longer bodied	Small framed
Skeletally extended	Narrow based
Extended	Shorter from blade to hip
More length from blade to hip	Narrower made
Growthy	Smaller outlined
Bigger scaled	Quick made
Bigger in his kind	Compact

Balance

POSITIVES	NEGATIVES
Level topped	Poorest designed
Level designed	Lower tail set
Level hipped	Weak in his/her chine
Set up higher at the base of his tail	Breaks behind his shoulder
Fresher in his/her chine	Steep hipped
Stronger, fresher topped	Weak topped
Nicer designed	Off balanced
Stronger behind his/her blades	Breaks in his/her top
Taller fronted	
Longer from his blades forward	
Relation of her chine bone to the top of her hip	

Attractive but not too refined

Chine bone/shoulder blade relationship

Volume

POSITIVES	NEGATIVES
Bigger volumed	Shallow ribbed
Bolder sprung	Flatter ribbed
Center body width	Tapers at the base of his rib
Drives at me more opened up underneath	Tight hearted
Wider chested	Narrow chested
Wider between his blades	Tighter flanked
Bolder bladed	Dry centered
Deeper ribbed	Harsh made
More internal volume	Flat shouldered
Production oriented	
Functionally/durably constructed	
More practically designed	
More practical in rib shape	
More curvature and shape to rib	
Deeper in his rear flank	
More outward curvature to his rib	
True in her integrity out of her shoulder	
Appears to have more natural fill	
Openness of center skeleton	
Expansive in rib	
Squareness of center body	

More pulled apart through her blades

Drove at me with more width through her chest floor and left with the same advantage

Powerfully constructed

Opens a bigger, deeper rib behind a boulder set of blades

Finish (fat cover - market)

POSITIVES	**NEGATIVES**
More blade action	Heavier conditioned
Trimmer made/designed	Stale appearing
Cleaner made	Wastier made
Sharper loin edge	More nondescript in top
Cleaner through his lower 1/3 shape	Harder made
Cleaner underneath	Dry flanked, dry rib
Leaner seam of ham	Past terminal endpoint
Leaner designed	Requires more days on feed
Ultra lean, raw designed	
Leaner neck and jowl	
Reads leaner down his top	
Fresher, squarer turn to the base of her rib	
More compositionally correct barrow	

Muscle

POSITIVES	NEGATIVES
Meat animal shape	Plain
Heavier muscled	Lighter muscled
Three dimensional in ham	Flat through lower ham
Thicker topped, bigger ended	Tighter in muscle design
Reads with more honest shape down his top	Flattens through his ham and stifle
More defined in his ham/loin junction	Narrower topped
Wider, more correct turn down top	Nondescript down top
More desirable in muscle design	
Works more product from blade to hip	
Lays more product over a wider skeleton	
Comes out of her blades with more true muscle shape down her top	
More aggressive turn to his loin edge	
More pop and flare to the center and lower portion of her ham	
Works a longer, deeper groove down a fresher top	
Squarer turn to the edge of her loin	
Reads with more natural thickness down her top and maintains more mass and power through her ham	
Product oriented, carcass oriented	
Cutability driven	

Structure

POSITIVES	NEGATIVES
Sounder made	Coarse jointed
Looser structured	Tighter structured
Freer moving	Tight in his top
Looser made	Narrow tracking
More functional in movement	Over in her knee
More durably constructed	Straight shouldered
Tougher constructed	Upright in shoulder
More correct on feet and legs	Poor structured
More flex and cushion to hock and pastern	Insecure stride
More even in her toes size	Hesitant in stride
More cushion up front	Restricted stride
Wider tracking	Small footed
Easier driving	Forward in his blade
Squarer from hock to ground	More rigid in her hock
Set down on the surface with more cushion and flexibility	Tight hipped
More flexible in her knee and hock	
Easier moving, more mobile	
Better set to her shoulder	
More confinement adaptable	
Drives with more comfort off both ends of her skeleton	
Agile moving	
Athletic	

Longer and looser in her hip

Longer strided, truer tracking

More curve to his knee

More forward in the set to her shoulder

More pliable in her structure

More uniform in his rear toe size thus
allowing him to track away truer and squarer

More durably designed

Offers more structural integrity

Carcass (market hogs)

POSITIVES	NEGATIVES
Should yield a more shapely carcass	Wastier made carcass
Looser structured	Tighter structured
Should hang a heavier muscled carcass	Requires more trim and throw away
Yield a carcass with higher percent muscle	
More packer preferred carcass	
More total retail product	
Longer sided carcass	
Hang the heavier pay weight that demands a premium in muscle yield	
Hang more lbs of fat-free lean	
Rail a higher percent lean	

Example Set of Market Hog Reasons

Amanda Wolf

Houston
Market Barrows

I like the drive of market barrows 1-2-4-3. And I found a pair of heavier muscled hogs to sort up. And in my top pair I marked the masked hog over 2. He drives at me wider through the floor of his chest and opens up into a bigger deeper rib behind a bolder set of blades. He works a tremendous amount of product from blade to hip and he leaves me in the same fashion. Now I'm not saying my class winner is perfect, he is shorter coupled and could be leveler hipped. I'll give this advantage to 2, who is longer from blade to hip and who's more pulled up at his tail set. Unfortunately he too is working up in his chine, isn't as bold and square behind his blade, and could hook up neater from his loin into his hip so he's second.

Nevertheless in my middle pair it's still 2 over 4 because he's the sounder hog who plants and drives with more authority as he moves across the pen. He is also more descript in his muscle shape so I predict he will cut with larger more profitable cuts of retail pork. Certainly the chromed up barrow is bigger footed and stands on more circumference of bone but he's flatter ribbed, narrower at the top of his rump and less descript through the seam of his ham, so I marked him third.

Regardless, in my final decision I used 4 over 3. He's the barrow who's got more product in his forearm, is softer sided and has more topside muscle. I appreciate that 3 isn't devoid of muscle but the short tailed hog is the smallest footed, frailest featured, hardest ribbed and driest flanked so the hog that's the straightest off both ends is fourth.

Breeding Swine

There are numerous breeds and environments for breeding hogs. Often, breeding hog classes will be paired with performance data that explain what breeds the animal will be mated to, what the environmental conditions are for feed and labor and how the animals will be marketed. It is important to understand these elements in order to place breeding hog classes appropriately to their form and function.

Maternal vs. Terminal Breeds

Hampshire (Terminal)
Hogs that are black with a white belt. They have erect ears. The belt is a strip of white across the shoulders that cover the front legs around the body. The Hampshires, which are a heavily muscled, lean meat breed, are the third most recorded breed of the pigs in the United States.

Yorkshire (Maternal)
Hogs that are white in color and have erect ears. They are the most recorded breed of swine in the United States and in Canada. They are found in almost every state, with the highest populations being in Illinois, Indiana, Iowa, Nebraska and Ohio. The modern Yorkshire is very muscular, with a high proportion of lean meat and low backfat, in addition to being very sound and durable.

Duroc (Terminal)
Red pigs with drooping ears. They are the second most recorded breed of swine in the United States and a major breed in many other countries, especially as a terminal sire or in hybrids. Durocs can range from a very light golden, almost yellow color, to a very dark red color that approaches mahogany.

Landrace (Maternal)
A white hog of long body length, having sixteen or seventeen pairs of ribs. The ears are large and heavy and are carried close to the face. The sows are prolific and satisfactory mothers. The sows have always been noted for their milk producing abilities.

Chester White (Maternal)
A white hog with drooping ears. They are known for their high conception rate, large litters, durability and soundness.

Spot
A predominantly black hog with white spots and level ears. Spots have continued to improve in feed efficiency, rate of gain, and carcass quality, as can be proven in the testing stations throughout the country. Spots are popular with farmers and commercial swine producers for their ability to transmit their fast-gaining, feed efficient, meat qualities to their offspring.

Poland China

Hogs that are black with six white points (feet, face and tail) with drooping ears. The Poland Chinas are excellent feeders and they gain readily under conditions of good care and management. The breed is known for having very substantial bone and for being sound in its feet and legs. The Poland China has established its reputation and remains popular in commercial hog circles attests to the fact that it is a breed not to be criticized for inability to raise large, satisfactory litters.

Sows and Gilts (females)

POSITIVES	NEGATIVES
Prominent underline	Coarse underline
More evenly spaced underline	Pin nipple
More functional underline	Tipped vulva
More refined and uniform underline	Unevenly spaced underline
Broodier made	Frail
Maternal	Coarse in her underline texture
Youthful appearing	
Productive	
More functional in a confinement scenario	
Cleaner hocked	
Highlights her maternal kind with a high quality underline	

Boars (males)

POSITIVES	NEGATIVES
Ruggedly designed	Frail made
Heavy boned	Small testicled
Stout made	Swollen sheath
Big footed	

Large testicled

Powerfully made

Stout skulled

Durable

Masculine

Performance Data and Scenarios

Below is a list of most of the terms used in performance data scenarios.

Accuracy (ACC) - A measure of the precision with which genetic merit is predicted. Accuracy ranges from .01 (low) if no information is available, to .99 (high) if there is a large amount of performance information on the individual and its relatives. It is an expression of the reliability of the EPD. Accuracies indicate the level of confidence that the predicted EPD is near the true genetic potential of that animal.

Backfat (BF)- Backfat thickness measured ultrasonically in inches, adjusted to 250 pounds live weight. Sires or sows with negative (-) EPDs for Backfat will produce pigs that have less backfat at market weight than pigs of parents with average EPDs.

BLUP Best Linear Unbiased Prediction- A set of statistical qualities that describe the methodology utilized in calculating STAGES genetic evaluations. BLUP utilizes an animal's own record (if available) along with all relatives' records, including ancestors, siblings, and progeny. Thus it takes into account genetic relationships as well as the relative merit of an animal within its contemporary group. The major feature is that evaluations are unbiased.

Contemporary Group, Reproductive Traits - A group of sows of the same breed that farrow in the same room and have minimal age differences among litters. Optimal reproductive contemporary groups included 6 or more litters born from sows sired by 3 or more sires, with litters born within a 7 day period and weighed at 17-25 days of age. Minimum requirements include at least 2 litters born from sows sired by 2 sires, with litters born within a 30 day period and weighed at 10-35 days of age. STAGES accepts purebred litters as well as crossbred litters from purebred females for the purposes of genetic evaluations; however, purebred and crossbred litters should be in different contemporary groups.

Contemporary Group, Postweaning Traits- A group of pigs of the same breed and sex that have been raised in the same management group (in the same location and on the same feed). Optimum postweaning contemporary groups include 6 or more litters of pigs sired by at least 3 sires, born within a 7 day period and weighed and scanned at the same time. Minimum

requirements include at least 2 litters born within a 30 day period and weighed and scanned at the same time.

Days to 250 Pounds (Days) - Estimated days to reach 250 pounds. An NSIF equation calculates days to 250 pounds from the animal's weight and age. Sires or dams with negative (-) EPD for Days will produce pigs that reach market weight faster than pigs of parents with average EPDs.

EPD Expected Progeny Difference - The predicted performance of future offspring of an individual, expressed as a deviation from the mean of the base group of animals. EPDs are equal to 1/2 the estimate of the breeding value, and are reported in the units of measure of the trait (e.g., pounds, inches, square inches, days). They are adjusted for the differing amounts of information available for each animal. BLUP procedures are utilized, ranking the animals according to their genetic merit and allowing direct comparison of animals within a breed. Whether + or - values are more desired depends on the trait (negative EPD are desired for Days and Backfat; positive EPD are desired for Number Born Alive and Litter Weight). Feed/Pound of Gain Pounds of feed consumed per pound of gain.- An EPD for Feed/Gain is calculated from the EPDs for Days to 250 Pounds and Pounds of Lean. This EPD is not reported, but is used in the calculation of indexes.

Litter Weight (LWT) - Litter weight adjusted to 21 days of age. Breed-specific adjustment factors are used to adjust for parity, number born alive, number after transfer, and age of weaning. Daughters of sires with positive (+) EPD for LWT will produce heavier litters than average EPD females. For nonparent animals, EPDs for LWT are estimated as parental averages.

Loin Eye Area (LEA) - Loin Eye Area measurement in square inches, adjusted to 250 pounds live weight. The EPD for LEA is not reported, but is used in the calculation of an EPD for Pounds of Lean (Lbs.).

Maternal Line Index (MLI) - A bio-economic index for seedstock which are used to produce replacement gilts. MLI weights EPDs for both terminal and maternal traits relative to their economic values in a crossbreeding program, placing twice as much emphasis on reproductive traits as on postweaning traits.

Number Born Alive (NBA) - The number of live pigs farrowed in a litter, adjusted for parity of the sow. Daughters of sires with positive (+) EPD for NBA will farrow larger litters than average EPD females. For nonparent animals, EPDs for NBA are estimated as parental averages.

Number Weaned (NW) - The number of pigs that a dam raised to 21 days of age, adjusted for parity and number after transfer. The EPD for NW is not reported, but is used in the calculation of indexes.

Pounds of Lean (Lbs.) - Pounds of fat-free lean adjusted to a 185 pound carcass or approximately a 250 pound live pig. The EPD for Pounds of Lean is calculated from the EPDs for Backfat and Loin Eye Area. A sire with a positive (+) EPD for Pounds of Lean will produce offspring that yield a higher percent of lean than offspring from a sire with a lower EPD for Pounds of Lean.

Reproductive Traits - Traits measured on the sow, involving the farrowing and rearing of a litter. Traits include Number Born Alive (NBA), Number Weaned (NW), and 21-day Litter Weight (LWT).

Selection Index - A formula that combines the EPDs from several traits into a single value for each animal. STAGES weights the EPDs to calculate three indexes which consider the intended use of seedstock in crossbreeding systems and which consider the relative economic value of each trait.

Sow Productivity Index (SPI) - A bio-economic index that ranks individuals for reproductive traits. SPI weights the EPDs for Number Born Alive, Number Weaned, and 21-day Litter Weight relative to their economic values when used in a crossbreeding program.

Terminal Sire Index (TSI) - A bio-economic index that ranks individuals for use in a terminal crossbreeding program. TSI weights EPDs for Backfat, Days to 250 pounds, Pounds of Lean, and Feed/Pound of Gain relative to their economic values.

Performance Data (Scenario) Statements

Backfat

His/her offspring should have an advantage in cutability
His/her offspring should excel on a lean-value based marketing system

Days to 250

His/her offspring should require fewer days on the feeding floor
Expect her to produce pigs that require fewer days to 250
…faster growing offspring

Number Born Alive

…should produce larger litters

21-Day LWT

…should wean off heavier pigs due to milk

Example Statements

(…structure) thus should be better suited to the confinement operation.

…offspring should generate more interest at state and national shows and sales

…due to his/her advantages in growth and leanness, I'd expect his/her sons to be more marketable as commercial boars.

Barrow maker

Female maker

Generates like she looks she should produce the more functional lucrative females

She is the more maternal female that would be better suited for the production of replacement gilts

She is a sounder, more mobile gilt and I would expect her to endure more parities

She is better suited for the production of terminal boars, as her sons should generate more profit for producers who market on lean value

Example Set of Performance Gilt Reasons

Performance Yorkshire Gilts

My alignment of the performance Yorkshire gilts is 1234. There's a powerful yet functional made gilt to start and it's her ability to combine these brood sow fundamentals with a look of quality that labels her as my class winner. As she extended, attractive made females that's the most reliable in her angels and it's this durable build blended with her maternal rib and look that would only suggest she would generate the most lucrative blue butt show pigs and replacement females alike.

Now I have to commend the litter #3 gilt she's extended and most closely replicates my class winner's body type, yet she finds a home in 2nd she doesn't hook up right behind her blade and is flatter in her rib. Yet these concerns are minor in relation to my remaining trio as 2 offers more maternal replacement value. She's a higher indexing gilt whose bigger bodied and looser made and it just makes sense her daughters should benefit and hold up better in a production setting.

Now as 3 drives under me I am impressed with shape and expression, yet this has negatively affected her as she's harsh about her rib up in her chine, forward in her blade and tight in her hip. Even so in my bottom pair of gilts whom I question from a production standpoint I can still use 3 extra mass and shape to beat 4. She's taller shouldered and from there back is more massive over her topside spreads more lean shape and takes this out through her hip. If she holds up I would envision her market bound progeny to reap the rewards of a lean value matrix.

Now I will admit 2 is deeper bodied, unfortunately I don't foresee her offering any economic incentive to this operation as she's the low performing flat narrow made gilt that's the most restricted off both ends of her skeleton.
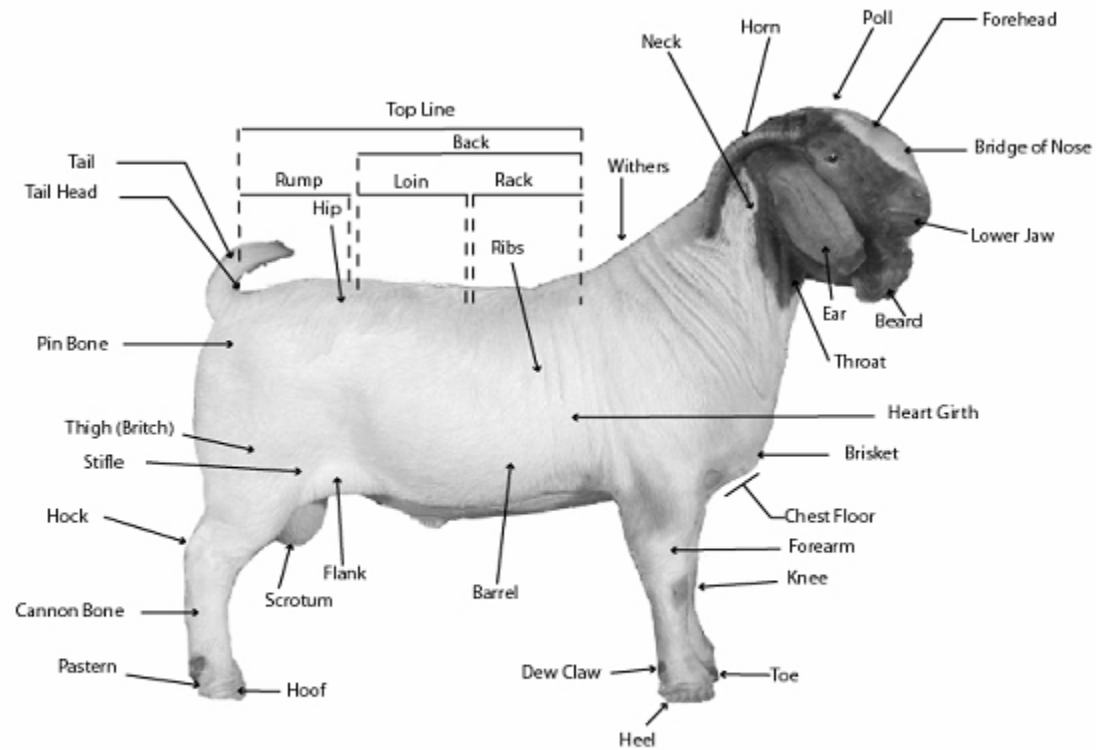
NOTES

Evaluating Meat Goats

Image from American Institute for Goat Research at Langston University (http://www.luresext.edu/)

Meat goats have become a standard part of livestock judging contests. There are numerous resources on selection and evaluation of meat goats. We refer to the "Selection Methods and Tools" article on Langston University's American Institute for Goat Research (http://www.luresext.edu/).

Many of the meat goat terminology is a blend of cattle and sheep terminology. Animals are evaluated on the basis of muscling, fat, structure and volume, just like in other species. Market animals are evaluated on the potential of their carcass whereas breeding animals and evaluated on their productive potential. Males should be rugged and masculine, females should be broody and feminine.

Example Set of Breeding Doe Reasons

Breeding Does

I like the yearling does 4-3-1-2. There's a pair of bold, maternally designed goats that offer tremendous brood doe potential…but 4's ability to combine power with a bit more balance allows her to start. She's the widest constructed, boldest ribbed and most opened up underneath…then…the female that's the most ideal about the shape to her head and horn is also quite a bit stronger behind her shoulder and truer in her lines…and she handles her mass with comfort and flexibility.

Now the black caped doe in second also comes with tremendous body and substance…but the looser shouldered goat comes apart in her topline and is tighter in her heart. From here…there's not a doe remaining that comes close to matching 3's extra volume and substance…so I easily kept her second….and as you might expect by her strong jaw and broad horn set…she's a tough structured, heavy skeletoned female that's particularly bolder in her rib and body …all of which should make her easy to maintain when put to work.

As an individual…I read a great deal of quality in 1's build and bone…she's actually more correct behind her shoulder and is square at the ground…but when put in the mix…she falls behind the most in performance and needs opened up in her center rib. For me the decision lies within a bottom pair of does that have tradeoffs… and it's here where I find more long term value in 1's build and correctness…the stouter featured goat is not only heavier boned and bigger footed, but she's more correct in her angles and stays leveler out her hip.

Now in terms of extension and look upfront…2 still has some pieces to breed on….but the light pigmented doe does have problems that become the hardest to correct…she's the tight hocked…frail structured doe that rounds out her hip and is the most refined at the ground.

NOTES