Judging Performance Classes

Kevin Laurent, Extension Beef and Swine Associate
Richard Coffey, Ph.D., Extension Swine Specialist

Introduction

In some livestock evaluation contests, participants will be required to place a performance class of breeding animals. A performance class is one in which two important pieces of information are provided to contestants: (1) a production scenario and (2) performance data. In some livestock evaluation contests, the scenario and performance data are used in conjunction with evaluating the phenotype of the live animal to arrive at a placing, and, in other contests, the scenario and performance data serve as the sole basis for placing the class. Whatever the type of contest, it is important to gain an understanding of how to properly use the scenario and performance data when evaluating a performance class.

Production Scenario

The production scenario is the script that serves as a road map for using the performance data that are provided for the animals in the class. It lets you know how to prioritize the performance data and decide which pieces of the data to use based on the real-life needs of the situation described in the scenario. The scenario will typically contain three general areas of information for you to consider: (1) the breeding program, (2) the environmental and feed/labor resources, and (3) the marketing program.

Breeding Program

This information will describe the type of breeding program the animals will be used in when placed within the herd. This is a very important piece of information because different types of breeding programs will require different performance data emphases. For example, if the animals will be used in a terminal program where offspring are sold as market animals (no offspring are kept as replacement females), then you should ignore any performance data on maternal traits and consider only the performance data that pertain to growth and carcass characteristics. On the other hand, if a strong emphasis of the breeding program is on the development of replacement females, careful consideration should be given to the performance data on maternal traits.

This part of the scenario will also usually describe the goals or objectives of the breeding program and outline the specific areas or traits that the producer is trying to improve or moderate. For example, the scenario may state that the producer is trying to improve weaning weights or postweaning growth, moderate mature size, or improve muscling. This type of specific information will help you decide which performance data to use in evaluating the class.

Environment and Feed/Labor Resources

The information in this part of the scenario will describe the conditions in which the animals will be raised. It will typically describe whether the animals will need to perform in an environment that is considered high stress or low stress. For example, if cattle or sheep will be raised under range conditions with limited feed and labor resources, then extremes in frame size, growth, birth weights, and milk production should be avoided. Conversely, if the animals will be intensively managed in an environment where feed and labor for assistance at birthing are not limiting factors, then substantial emphasis can be placed on traits such as high growth and high milk production. This area is most important for cattle and sheep performance classes because most swine are raised in confinement with adequate feed resources.

Marketing Program

This part of the scenario will generally give information related to the age at which the offspring will be marketed and the kind of buyer or marketing program under which the progeny will be sold. For example, it may explain that the offspring will be sold at weaning or that ownership will be retained until slaughter or harvest. If animals will be sold at weaning, special emphasis should be placed on the performance data that influence weaning weight. If ownership will be retained until the animals are slaughtered, then the performance data for yearling weight (cattle), 120-day weight (sheep), and days to 250 lb (swine) should receive more emphasis.

Another important consideration is how the progeny will be valued when they are sold. For instance, will the market weight animals be sold under a lean value or grid marketing system? These are systems that place a value on the market animals based on their measured carcass merit at slaughter. If animals will be sold under these types of marketing programs, the performance data for carcass traits become very important. Additionally, if the goal is to produce animals for the show ring, then more emphasis should be placed on visual traits than on performance data.

You should realize that, while these three general areas of information will be given in the production scenario, this information is often not grouped neatly into three distinct parts. In most animal evaluation contests, the scenario for a performance class is simply written in narrative form, and you must carefully read and think about the scenario to find the pertinent information to use.

Beginning livestock judges must also realize that these three areas of information are interrelated and may overlap. For

example, in a scenario for a performance class of bulls, both the breeding program and the labor resources must be considered when determining how much emphasis should be placed on birth weight. Calving ease and low birth weight are not only critical things to consider for bulls bred to heifers but are also important for bulls bred to mature cows if labor resources are limited during the calving season.

For performance classes, contestants should carefully read the production scenario, determine which of the performance data are most important, and then base their placing of the performance class on the specific needs of the situation.

Performance Data

The performance data will be the chart and numbers portion of the data sheet that is provided to all contestants. There are usually more performance data provided than needed to place a performance class. Your challenge is to find and use the pertinent data (based on the scenario) and ignore the irrelevant information.

There are two basic types of performance data that may be provided: (1) actual data for the animals in the class (weights, measures, or ratios) and (2) Expected Progeny Differences (EPD). Each of these types of performance data is discussed below.

Actual Data

Actual data are the weights and (or) measures that have been taken on the individual animals you are judging. Examples might include actual birth weight, actual weaning weight, actual days to 250 lb, actual hip height, actual scrotal circumference, etc. This information may also be expressed in the form of a ratio. A ratio compares an individual's record to the average record of the animals it was raised with (its contemporary group) for a particular trait. Ratios are expressed as a number in which 100 equals the average of the group. For example, a bull with a weaning weight ratio of 106 has a weaning weight that is 6% heavier than the average of his contemporary group (106 - 100 = 6). Conversely, a bull with a weaning weight ratio of 94 is 6% lighter than the average of his contemporary group (100 - 94 = 6).

There are three main limitations to using actual performance data. The first limitation is that actual data are only a measure of that individual's record and do not take into account the performance of ancestors or relatives. The second limitation is that actual data can be affected to a very large degree by the environment (housing, feed, management, etc.) in which the animal was raised. For example, a bull that was not fed well may not have had a chance to reach its genetic potential for yearling weight. The third limitation is that this type of data cannot be used to compare animals from different groups within the same herd or to compare animals from different herds. This limitation arises from the fact that animals from different groups or herds were raised under different environmental conditions. Common sense will tell you that half the bull calves in the best Charolais herd in the country will have a ratio less than 100 for weaning weight, whereas, half the bull calves in the worst Charolais herd in the country will have a ratio more than 100 for weaning weight. But the ratio for an individual animal does not provide a basis for comparing bull calves between the best and worst Charolais herds.

Expected Progeny Differences (EPDs)

EPDs are indicators of the genetic worth of an individual animal as a parent when compared to another individual of the same breed. In simple terms, the reason EPDs are more useful than actual data is because the individual's record is combined with relatives' records for a much more powerful estimate of expected future performance. This minimizes the environmental effects and allows two animals from different contemporary groups or herds to be compared.

EPDs are always reported in the unit of measurement for that trait. For example, the weaning weight EPD is reported in pounds, the backfat EPD is reported in inches, and the marbling EPD is reported in degrees of marbling. This makes it very easy to compare animals within the class. As an example, let's assume we have two boars, boar A and boar B. Boar A has a Days to 250 lb EPD of +2.0, and boar B has a Days to 250 lb EPD of -1.0. We would expect pigs sired by boar A to reach 250 lb three days later than pigs sired by boar B (+2.0 - [-1.0] = 3.0).

From a practical standpoint, if both actual data and EPDs for a given trait are provided in the performance data for the class, you should almost always use the EPDs and ignore the actual data when evaluating the performance information. One exception to this is scrotal circumference in certain scenarios for bulls. For example, if the scenario describes that bulls will be used solely in a commercial, terminal breeding program (a system in which all male offspring will be castrated and sold for slaughter rather than a breeding program in which bull calves will be sold as breeding stock to other producers), it is better to use the actual data for scrotal circumference than the EPDs for scrotal circumference. This makes sense because you are only concerned with the actual scrotal size of the bulls you are judging, not the scrotal size of his male offspring, which will all be castrated. However, if EPDs for a particular trait are not available, but actual data are given, use the actual data. Some data is always better than no data

There are a few simple but important facts to keep in mind when using EPDs:

1. Most EPDs can only be used to compare animals of the same breed. However, depending on the species and how the EPD was calculated, it may be valid for use in comparing animals across different breeds within a species or for only making comparisons within a herd or flock.

2. EPDs do not predict absolute performance but provide an estimate of the expected difference in performance between the animals being compared.

3. Average EPDs do not necessarily equal zero (0). The most current sire summaries for the various breeds will list the average EPD values for each trait.

4. The biggest EPD value is not always the best. For some traits and certain scenarios, a smaller or lower EPD value may be desired.

Example Classes with Performance Data and Production Scenarios

Now that you know about production scenarios and the information they provide, as well as the kinds of performance data that are given for a performance class of breeding animals, let's look at three example classes and see how this information is used.

Example 1—Hereford Bulls
Scenario

These bulls will be used on purebred Angus cows to produce F-1 Hereford-Angus offspring. These Angus cows average approximately 1,200 lb in mature size and are above average in milk production. The herd is located in Central Kentucky and is maintained on fescue-clover pasture. The winter feeding program consists of stockpiled pasture and hay and minimal amounts of a grain by-product supplement. Feed and labor are adequate. The bulls will be bred to both mature cows and heifers. The majority of the heifer calves are developed and sold as bred heifers to area producers with similar management conditions. The producer wishes to produce bred heifers that are moderate in mature size and milk production. All steers and remaining heifer calves are backgrounded approximately 100 days postweaning and sold in CPH-45 graded feeder calf sales.

Performance Data

| Bull No. | Expected Progeny Differences | | | | | |
	Birth Wt.	Weaning Wt.	Yearling Wt.	Milk	IMF%[a]	REA[b]
1	1.0	41.0	60.0	15.0	0.05	0.08
2	8.6	51.0	87.0	32.0	0.12	0.21
3	−1.0	43.0	65.0	18.0	0.09	0.11
4	1.5	39.0	57.0	2.1	0.14	− 0.11
Breed Avg.	3.9	37.0	62.0	14.0	0.01	0.06

[a] Intramuscular fat (marbling)
[b] Ribeye area

Discussion of the Hereford Bull Performance Class

After analyzing the scenario, you can see that these bulls will be used on both heifers and cows in a maternal cross to produce replacement females. The producer wishes the resulting bred heifers to be moderate in mature size and milk production. Feed and labor resources are adequate. The marketing program requires all calves to be kept at least 100 days or longer postweaning, but none of the calves will be owned until slaughter. Based on these specific needs identified in the scenario, low birth weight, moderate milk, and moderate yearling weight EPDs are desired, and carcass EPDs will not be a priority.

This scenario also provides some clues about how the class should be visually appraised (if the bulls will also be evaluated live). Calves in graded sales must, at minimum, be of medium frame and be a muscle score 2. Also, bred heifers that are high volume and eye-appealing are easier to sell. This means

tight-ribbed, light-muscled bulls will not work in this situation, regardless of their performance data.

Based on the data, 2 does not fit the scenario for three reasons: extreme birth weight, extreme yearling weight, and extreme milk. This bull should be placed last in the class. The next bull whose data are slightly at odds with the scenario is 4, because of his low milk EPD. On paper, 4 logically falls into third place in the class. However, he could possibly challenge one of the top pairs of bulls for second place from a visual standpoint. That leaves 1 and 3 to consider, both of which are acceptable on birth weight and moderate in milk and growth. In an evaluation contest where you are not able to visually appraise the bulls, 3 would be placed over 1 due to its slight advantage in data. In a judging contest where visual evaluation (in addition to the performance data) is used, these two bulls should be separated by visual appraisal. In real life, in determining which of these bulls to purchase, you would also want to evaluate the maternal traits (such as calving interval, udder quality, etc.) for these bulls' dams.

Example 2—Duroc Gilts
Scenario

These gilts will be used as replacements in a purebred Duroc herd. This herd is a source of terminal line boars for a group of commercial swine operations. There is also a small seasonal market for show pigs. All farms involved in this arrangement are total confinement operations and market under a grade and yield program. Growth rate in the cooperator herds has been excellent, but leanness could use more improvement.

Performance Data

| Gilt No. | Expected Progeny Differences | | | | Terminal Sire Index |
	No. Born Alive	21-Day Litter Wt.	Days to 250	Backfat	
1	0.26	1.91	− 1.35	− 0.03	118.2
2	− 0.04	− 0.42	− 3.48	− 0.04	128.2
3	0.13	1.23	− 0.94	0.05	109.8
4	− 0.01	− 0.03	− 2.48	0.02	120.4
Breed Avg.	0.01	0.19	− 0.56	0.00	101.3

Discussion of the Duroc Gilt Performance Class

A careful study of the scenario reveals that these gilts will be used as replacements in a purebred herd that primarily produces terminal line boars. This means that the Terminal Sire Index will provide the best overall information from a data standpoint and that the maternal traits of number born alive and 21-day litter weight will be the least useful for arriving at a ranking. The Terminal Sire Index combines the EPDs of Days to 250 and Backfat into an economically weighted selection index. This index helps determine the best combination of these two terminal EPD traits. The scenario also mentions the fact that there is a seasonal market for show pigs. This should serve as a clue to use type and balance as secondary evaluation criteria if these gilts will also be visually appraised.

After comparing the Terminal Sire Index values, the class fairly easily breaks into an easy top placing in 2 and an easy bottom placing in 3. The middle pair of 1 and 4 is very similar in terms of their Terminal Sire Index. However, if you look at the two traits that make up the index, you will notice that 4 excels 1 in growth but is weaker in backfat. On the other hand, 1 is fairly balanced for both traits having a negative EPD for days to 250 and a negative backfat EPD. Based on the scenario, 1 (compared to 4) more adequately meets the goal of reducing backfat, even though 4 has a slightly higher Terminal Sire Index. Therefore, in this class 1 would be ranked higher than 4.

Example 3—Dorset Rams
Scenario

These rams will be used as stud bucks in a purebred Dorset flock. Feed and labor resources are plentiful. The main market for ewes and rams of this flock is other purebred breeders. The breeder's goal is to improve maternal and growth traits. Replacement ewes are retained within the herd.

Performance Data

| | | | | Expected Progeny Differences | | | |
| | | | | Maternal | | Growth | |
Ram No.	Birth Type[a]	Birth Rearing[a]	Birth Wt.	Percent Lamb Crop	Maternal Milk	60-Day Wt.	120-Day Wt.
1	TR	TW	8.9	3.4	1.5	2.1	3.1
2	S	S	11.8	– 3.2	0.0	0.3	0.6
3	TW	S	10.4	– 0.6	– 1.0	– 0.5	– 2.1
4	TW	TW	9.4	2.3	1.2	1.3	3.0
Breed Avg.				0.57	0.20	0.36	0.76

[a] S = Single; TW = Twins; TR = Triplets

Discussion of the Dorset Ram Performance Class

This is a very straightforward scenario describing an elite purebred breeding program that primarily markets progeny to other purebred breeders. Because improvements in maternal and growth traits are desired, both the maternal and growth EPDs should receive primary emphasis from a data standpoint. With the primary market being other purebred breeders, breed type should receive some attention if this class will also be evaluated visually.

The maternal and growth data logically sort this class into two pairs with a top pair of very acceptable rams in 1 and 4 and a bottom pair of rams with poorer data in 2 and 3. In real life, these two pairs would be ranked by visual appraisal. But based strictly on the performance data that are provided, 1 would be ranked over 4 in the top pair, and 2 would be ranked over 3 in the bottom pair.

Oral Reasons Phrases for Performance Classes

In some livestock evaluation contests, oral reasons may be required for performance classes that are evaluated using both the performance data and visual appraisal. The following are some phrases that illustrate how to incorporate performance data into a set of oral reasons.

- The scenario dictates a growthy, heavy-muscled bull; thus, 4 sorts to the top as he is the thickest-ended bull in the class with the highest yearling weight EPD.
- He is simply the least scenario-adaptable bull in the class.
- He had the most genotypic merit and would likely inject the most genetic progress into his offspring.
- She reads with the most-balanced script of EPDs for the given scenario.
- She offers the best combination of genotypic and phenotypic design.
- Due to his advantage in growth EPDs, I would expect his offspring to have heavier weaning and yearling weights.
- His advantage in body volume coupled with a positive backfat EPD should result in easier-fleshing, lower-maintenance daughters.
- He possessed a more grid-oriented script of carcass EPDs.
- He had the least-desirable genetic profile.
- He offers the highest Terminal Sire Index value in the class and should sire pigs that will excel in the finishing barn and on the rail.
- She had the most genetic value for maternal traits and, therefore, should be better suited for producing F-1 females.
- Although she had the highest maternal line index value in the class, she was the least scenario-adaptable for show pig production.
- He was the flattest-ribbed, narrowest-made, and lightest-muscled boar in the class with the worst set of EPDs for the scenario given today.
- His advantage in 120-day weight EPD should result in faster growing progeny.
- Her advantage in lamb crop percentage and maternal milk EPDs suggests her daughters would excel in prolificacy and milking ability.