

# SWINE GENETICS



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**NSIF-FS17**

**Fact Sheet #17**

**Cooperative Extension Service**

**Purdue University**

**West Lafayette, IN 47907**

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## **Understanding and Using Performance Data in Judging Classes**

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This fact sheet is for training youth interested in swine selection practices. Improving efficiency of production is extremely important to the livestock industry. In order to increase pork production efficiency, we must use the most accurate inputs possible to make economically sound decisions. We make the fastest genetic improvement utilizing performance records and

Expected Progeny Differences (EPDs).

Livestock judging techniques are used daily by all livestock producers in selecting herd sires or replacement females, designing a breeding program, and determining when livestock are ready for market. Therefore, participating in livestock judging is an important educational tool for young pork producers.

Today's hog industry is changing at a faster pace than ever before. In addition, we are seeing these changes occur in all areas from production to processing. Evaluating performance information needs additional attention, since more emphasis is being placed on record keeping and utilizing records in the selection of breeding stock.

Young pork producers will be faced with selection decisions and should be prepared to use all performance information available to them. Therefore, activities such as classroom exercises, on-farm judging sessions, and livestock judging contests should include performance data. The combination of visual appraisal and performance data in livestock evaluation better prepares students for realistic selection decisions.

Judging contests have long been used to improve the decision-making abilities of young producers. When presented with a set of hogs, the contestant must make logical decisions as to the relative worth of each animal in the class. In the past, the only knowledge about the class came from visual appraisal alone. Size, soundness, and composition (lean to fat ratio) could be appraised visually. Now most contests are implementing performance data into classes. Factors such as weight per day of age, average daily gain, backfat, and days to 230 are easily measured, and contestants can make more accurate decisions by using these in their evaluation.

Ratios and EPDs provided by breed associations are also used in contests. These data can more accurately determine the genetic differences between animals than with individual records.

The following section deals with using performance data in classes during a judging contest. However, the same principles pertain to utilizing performance in your daily decisions.

The potential classes are as numerous as the selection decisions producers make each day. Two examples of judging situations that include performance records follow, but first review this five-step system for judging classes with performance records.

Use the following five steps to arrive at the best class rankings and justify your decisions.

1. Understand the class description, situation, or scenario.
2. Set priorities according to class description.
3. Evaluate the performance records.
4. Evaluate visual traits.
5. Decide on final rankings.

Now let's examine each step more closely.

**Step One**--Prior to the class, contestants should be given information about the class. Ideally, this printed information should explain the name, purpose, production conditions, and marketing circumstances for the class. Be sure to obtain the information (scenario) sheets and read through them before you continue judging the class.

Here's an example of a class scenario: Rank these Duroc gilts as they should be valued in a herd that profits mainly from the sale of seedstock to owners of terminal crossbreeding programs (Duroc boars are crossed on Landrace x Yorkshire females). Your

customers raise all hogs in total confinement and operate a farrow to finish operation. All progeny are sold on a carcass-merit system.

Within each scenario, the following information will be given:

Name--usually includes breed and sex--Duroc gilts.

Purpose--describes the planned use of the animals--Duroc gilts will produce terminal commercial boars used on Landrace x Yorkshire females.

Production conditions--describes the production environment--total confinement.

Marketing circumstances--describes the marketing plan for animals in this class or their progeny--the male offspring of these gilts will sire market hogs that will be sold on a carcass merit system.

The scenario can be simple or elaborate, depending upon the age and educational level of the student or contestant, or the concepts to be taught.

A realistic problem describing a production situation is the key to giving the class a meaning. It is not necessary to use actual data; hypothetical situations and data can be applied to a class in a realistic manner.

**Step Two**--Priorities may be given in, or along with the class description, especially for less experienced contestants. This priority statement can be specific or general depending on the experience level of the contestants. More advanced contestants should be expected to develop their own priorities from the information in the class description. At national and state level contests, priorities may not be listed and contestants must develop them based on the class description.

Priorities--describes what function the animals must serve--growth, leanness, muscle, and soundness (for the Duroc gilt scenario).

A statement on selection priorities should not imply that they are the only criteria to consider. Certainly, if a gilt has a severe structural problem or an unacceptable underline, or a boar has small testicles, they should place last, even though soundness or fertility were not listed as selection priorities.

**Step Three**--Evaluate the performance records. Listed on the scenario sheet will be the performance data for the four animals in the class. Read through the performance data and make sure you understand each category. Identify the performance categories that best relate to the priorities that you have decided on for the class.

For the Duroc gilt class, the priorities were growth, leanness, muscle, and soundness. From the following performance information, compare the gilts' days to 230 pounds, backfat scan, and loin eye measurement. Look for large differences that will be important in ranking the animals, and then make a preliminary placing.

In this class, litter size and 21-day litter weight are low priorities in the ranking decision. Days to 230 pounds, backfat, and loin eye area are most important. Gilts one and three have the best combination of growth, leanness, and muscling; so, logically, they should be in the top pair. Gilt two has acceptable backfat and loin eye scans, but her slow growth to 230 pounds puts her in the bottom pair. Gilt four has a favorable number of days to 230 pounds and has the largest loin eye scan. However, her backfat scan is substantially large compared to the other gilts, so she initially belongs in the bottom pair.

From this performance data a temporary ranking can be made based on the selection priorities. The initial ranking for this class of gilts might be 1-3-4-2.

An initial ranking makes the class easier to place, because now the pairs can be separated considering visual merit. Some classes will have performance data that identifies a top animal, but the remaining three will have similar data and must be ranked visually. In other classes, all the animals might be similar in performance data and the class is ranked solely on visual traits, or vice versa.

In this Duroc gilt example, the top and bottom pair are similar in data and need next to be visually appraised in order to arrive at a final ranking.

No.	Litter Size	21-day Litter Wt.	Days to 230 lb.	Adj. to 230 lb. Backfat	LEA
1	9	112	143	0.69	5.79
2	15	158	170	0.79	5.01
3	7	105	146	0.74	5.60
4	12	139	148	1.10	6.65

**Step Four**--Evaluate visual traits. Visual evaluation includes analyzing numerous traits such as reproductive and skeletal soundness, size, muscle, and fat development. When evaluating muscle and leanness, combine the scan data with your visual assessment. This is especially important if the ultrasound data were collected when the animals were about 230 pounds, but animals are judged when they are older and heavier. Some animals will put on more fat after they are scanned than others, and this could detrimentally affect their class ranking. Temporarily rank the animals on visual appraisal, like the performance ranking in step three.

**Step Five**--Decide on the final rankings. Often the performance rankings are similar to the conformation rankings and little adjustment is required. This is because positive visual traits are often associated with favorable performance results. However, when the rankings in steps three and four do not match, use your skills of compromise and logic. Remember: In breeding classes, reproduction and skeletal soundness are always important. It may be appropriate to make a ranking solely on the basis of performance data or visual traits; however, the final placing should be based on the largest and most important differences that are priorities for the class as defined in step two.

## Some Tips on Using Performance Information

There are three categories of performance information: REPRODUCTION, GROWTH, and COMPOSITION. Performance records can be presented as 1) individual measurements, 2) ratios and/or indexes, and 3) genetic merit estimates (EPDs).

## Performance Information for Judging

Category: Usefulness:	Individual Records Good	Ratios & Indexes Better	EPDs Best
REPRODUCTION	* number farrowed * number weaned * 21-day litter wt. * teat count * dam's record	* dam's SPI  * dam's index	* Born Alive EPD  * SPI EPD  * Maternal Index EPD
GROWTH	* average daily gain * weight/day of age * days to 230 lbs * feed efficiency (F/G)	* gain ratios * NSIF index * F/G ratios	* Days to 230 EPD * Terminal Index EPD
COMPOSITION	* backfat scan * loin muscle area	* BF ratio	* BF EPD * Terminal Index EPD

## Comparing Individual Records, Ratios, and EPDs

Each of these can be used in a judging contest. In order to be successful in using them, one has to know what each statistic means and the advantages and disadvantages of each.

### Individual Records

Individual performance data is the simplest and least valuable performance information. These are simply an individual's measurements or data with no consideration of environment or contemporary group comparisons.

Individual records are presented as either unadjusted or adjusted values that are easy to understand. Individual performance records can be appropriate if the four animals in the class are from the same contemporary group. However, if the animals are from different contemporary groups, individual records are of marginal value and cannot be fairly compared. If you must make decisions with only individual records, emphasize adjusted or standardized information such as days, backfat scan (BF), and loin muscle area (loin eye area (LEA)) at 230 pounds.

### Ratios and Indexes

Ratios and indexes are calculations that take into account how each animal performed relative to its contemporaries. They are superior to individual records and more accurately represent performance merit. Knowing that a boar's average daily gain ratio is 110 is better than knowing only that his average daily gain (ADG) is 2.25 pounds per day. For example, even though you are given a boar's ADG was 2.25 pounds, the other boars in his contemporary group could have averaged 2.75 pounds per day; so, obviously he wasn't a fast grower. But, if you are given an ADG ratio of 110, you know that he gained above his contemporary group average. Remember 100 is always the average ratio of the entire group, and ratios above 100 are superior to average.

Ratios of one or more traits are often combined to form indexes. Almost all indexes use 100 as the average, and indexes above 100 are above average. Given only 21-day litter weight and SPI (Sow Productivity Index) to select maternal gilts, emphasize the SPI differences, since SPI combines two maternal traits: number born alive and adjusted 21-day litter weight (adjusted for sow parity).

Here are three indexes available:

1. Sow Productivity Index (SPI)--is a measure of milking ability and prolificacy. The index combines number of pigs born alive and 21-day litter weight. It is adjusted for sow parity. The index is calculated with EPDs.

2. Terminal Sire Index (TSI)--This is a measure of growth, efficiency, and backfat. The index is calculated with EPDs.

3. Maternal Line Index (MLI)-- places more emphasis on reproductive traits than growth traits. Use when selecting replacement gilts. The index is calculated with EPDs.

## Expected Progeny Difference

The best performance data to compare potential genetic differences between animals are EPDs. Expected Progeny Differences are estimates which predict progeny performance compared to contemporary averages, assuming matings are to pigs of average genetic value.

The reason EPDs are the best measurements of genetic value is that EPDs are adjusted for differing amounts of information available for each animal (number of records, number of progeny, number of relative records, heritability of each trait, performance within contemporary group, etc.). This allows for an estimation of how progeny of the subject animal will compare to progeny of the other animals within the breed. These EPDs are expressed as plus or minus values, with the average EPD for the population approximately zero. It is important to remember that positive EPDs are more desirable for number born alive and 21-day litter weight, while negative EPDs are more desirable for days to 230 and backfat.

Therefore, if we compare the following two hogs, which could be either boars or gilts (assume equal accuracy):

Parent	Days to 230 EPD	Backfat EPD
A	-2.5	-0.07
B	0	0.05

Progeny of Parent A are expected to reach 230 pounds 2.5 days sooner than progeny of Parent B and have 0.12 inch less backfat (when mated to pigs of similar genetic value).

Again, let's compare the following two potential parents:

Parent	EPD for 21-day Litter Wt.	EPD for Number Born Alive
A	+3.2	+0.5
B	0	0

Parent A's daughters which would produce 0.5 more pigs born alive per litter and would have litter weights that were 3.2 pounds heavier at 21 days than Parent B (when bred to similar mates).

## EPD Accuracies

Accuracy (ACC) can range from 0 to 1.0 and is an expression of the reliability of the EPD. The EPDs are more reliable as the accuracies approach 1.0. For example, boars that have favorable EPDs and high accuracies can be used confidently. Boars with favorable EPDs and low accuracies should be used with caution.

In performance judging classes, EPDs will often be given without the accuracies for the convenience of the contestants. However, as a hog producer utilizing performance records, knowledge of accuracies and how they work is important.

## Definitions

**EPD Number Born Alive (NBA)**--predicts the number born alive for daughters' litters relative to their farrowing group average. An individual with an EPD of +0.5 would be expected to produce daughters which would farrow litters with 0.5 more pigs than a sow with NBAEPD 0.0.

**EPD Litter Weight**--predicts the 21-day weight for their daughters' litters. An individual with an EPD of +3.5 would be expected to produce daughters which would wean litters 3.5 pounds heavier at 21 days than a sow with an EPD of 0.0.

**EPD Days to 230 Pounds**--predicts the growth performance of offspring in days to 230 pounds live weight. An individual with an EPD of -3.0 would be expected to produce progeny that reaches 230 pounds 5 days faster than progeny of a parent with an EPD of +2.0.

**EPD Backfat**--predicts the genetic contribution of potential parents for backfat of their progeny at 230 pounds live weight. For example, a boar with a Backfat EPD (BFEPD) of -0.04 would be expected to sire progeny 0.04 inches leaner (10th rib BF) at 230 pounds than a boar with BFEPD of 0.00. As well, a gilt with BFEPD -0.05 would produce offspring 0.06 inches leaner than a gilt with BFEPD 0.01.

## Five Points to Remember About Using EPDs

1. EPDs describe how the animal's offspring will perform compared to the progeny of another sire or dam within the same breed.
2. EPDs match the trait they describe (i.e., EPD backfat is in inches, EPD born alive is in pigs per litter).
3. EPDs are positive or negative. Positive is favorable for number born alive and 21-day litter weight. Negative is favorable for days to 230 pounds and backfat.
4. EPD differences between animals are usually smaller than actual performance or ratio differences. For example, the adjusted backfat differences between two boars might be more than 0.10 inches, but the EPD backfat value difference between them may be less than 0.03 inches. This is because EPDs include heritability and close relatives' performance with individual record (ratio) to arrive at the most logical prediction of genetic value.
5. When EPDs are given, be careful not to emphasize an individual's records or ratios. Their ratios are part of their EPD calculations; therefore, if given the choice of performance data, make decisions based on EPDs.

Remember that there are no clear guidelines on placing classes, even though performance records are included. In fact, including weights and breeding values can create more ways to justify alternate decisions. The records may even be contradictory to the results of visual appraisal alone. However, these contradictions can provide a marvelous opportunity to discuss various producer goals and how alternative selection practices can be used to reach them.

## Implementing Performance Data into Your Reasons

It is important, especially in reason classes, that performance information be made available to logically combine visual with performance terminology.

At the beginning of your set of reasons, it is important to indicate the name and priorities of the class. How you phrase this and present this is dependent on your instructor. However, here are two examples on how to begin a set of performance reasons:

Place the Yorkshire gilts with performance data 1-2-3-4. Emphasize growth, soundness, and maternal excellence in my selection.

Based on the scenario given for the Yorkshire gilts, which emphasized growth, soundness, and maternal excellence, place them 1-2-3-4.

Because the scenario and performance data help rank the animals, it's important to implement the data and the priorities of the scenario within reason. Some examples of how to phrase these within reasons are:

- \* Long bodied, high-volumed gilt with a high sow-productivity index, which should indicate more productivity as a sow.
- \* A bigger framed boar with more natural muscle over his top, combined with a lower backfat scan, indicates that the boar should sire progeny that stay leaner to a higher weight.
- \* A sounder moving, more structurally correct gilt who should be more confinement adaptable and, thus, better fit the scenario.

## Example Scenarios for Practice

Students should be taught to understand each performance factor and to use the best information available in an optimum manner. It is impossible to describe every combination of class description and performance data set.

The following are practice scenarios you may use in order to become more successful in judging performance classes. These situations are similar to those you would see at state and national level judging contests.

Read through each scenario and the performance data given.

Make an initial ranking from the performance data by using the steps that you have learned within this fact sheet. Try to match your ranking with the correct ranking.

On the bottom of each page is an explanation of the given scenario, what should be concluded from the scenario and data, and the correct initial ranking based on the information.

As in any judging situation, it is impossible to make a clear-cut choice that cannot be argued. Students should not be discouraged if someone has a different opinion on how two individuals may best fulfill a given need. These decisions are always controversial. The ultimate goal is to make a sound, defensible decision based on fact and to learn from the judging exercise how to improve swine production through better selection practices.

### ***Situation:***

## **Hampshire Boars**

The boars will be pasture bred to Yorkshire/Landrace sows. All offspring will be sold and marketed on a value-based marketing system.

Make an initial ranking based on the given situation and the following production data.

The Hampshire boars in this class are going to be used as terminal sires. All offspring are going to be sold on a value-based marketing system. Therefore, the offspring need to be lean and heavily muscled to achieve high market premiums. No replacements are kept, so disregard the maternal data. Structural soundness is not a major priority in this class, since the boars will be used on pasture versus confinement. Certainly, if the boar has a severe structural problem, he should not be chosen. The priorities for this class are: leanness, muscle, and growth.

The initial ranking based on the performance data is 1-(4-2)-3.

Boar 1 is the leanest scanning, the fastest growing, and the heaviest muscled, so he initially starts the class. Boars 4 and 2 are similar in their performance figures and are too similar in their performance data. They need to be evaluated and ranked visually. Boar 3 has the poorest backfat scan, the most days to 230 pounds, and the smallest loin eye muscle scan. He initially is placed fourth.

## Production Data Hampshire Boars

Boar No.	Backfat	Days to 230 lb.	Loin Eye Area	Litter Data		21-day Wt.
				No. Born Alive	No. Weaned	
1	0.53	158	7.34	13	10	131
2	0.75	174	6.78	13	10	131
3	0.85	183	6.09	13	10	131
4	0.74	169	6.68	11	7	88

### ***Situation:***

## Duroc Gilts

Rank these gilts as they would best produce boars to be used in your customers' rotational Duroc x Landrace crossbreeding program. Your customers are farrow-to-finish operators and raise all hogs in confinement.

The key to evaluating this scenario is to understand a two-way rotational crossbreeding program. In this type of program, the Duroc boars are bred to Landrace gilts. The female offspring of this mating are bred to Landrace boars, and their progeny are bred back to Duroc boars. The rotation of the two breeds continues. The male offspring and cull gilts of this program are finished and sold, and the higher quality females are kept as replacements. Durocs are placed in the rotation to increase growth, muscling, and leanness. Landrace are used to improve the maternal traits.

The gilts in this class are going to produce the Duroc boars that are put into the rotation. Therefore, they must produce boars that are fast growing, lean, and heavily muscled. Structural soundness is also a priority, as all hogs are raised in confinement. Therefore, the priorities for this class are: growth, muscle, leanness, and soundness.

The initial ranking based on the performance data is 3-(4-2-1).

Even though maternal traits are not a major priority, all gilts still must be acceptable in their 21-day litter weight EPD and number born alive EPD, with no major reduction in any performance categories. All the gilts in the class have 21-day litter weight EPDs that are above breed average (zero) and acceptable. Each gilt also has a similar, positive EPD for number born alive. Therefore, you would not experience a setback with any of these gilts. You can now concentrate on the other traits.

Gilt 3 has the only negative EPD for backfat and has one of the best EPDs for growth. Coupled with her acceptable maternal traits, she initially starts the class. Gilts 4, 2, and 1 are all acceptable in their maternal data. Gilts 4 and 2 have the same backfat EPDs, but Gilt 4 has a slightly better days to 230 pounds EPD and has an advantage in 21-day litter weight EPD. Even though Gilt 1 has the best days to 230 pounds EPD in the class, she also has the poorest backfat EPD in the class. Note that each of these gilts has a negative growth EPD and, therefore, will decrease the days to 230 pounds.

Combining visual appraisal with performance data is very important in this class, since are not easily separated on performance records.

## Production Data Duroc Gilts

Gilt No.	Ear Notch	10th Rib Fat EPD (in)	Days to 230 lb. EPD (lb.)	21-day Litter Wt. EPD (lb.)	No. Born Alive EPD
1	14-6	+0.05	-1.9	+2.7	+0.32
2	14-8	+0.02	-0.2	+2.7	+0.32
3	14-9	-0.05	-1.8	+2.7	+0.32
4	15-9	-0.02	-0.8	+4.6	+0.29

### Situation:

## Yorkshire Boars

Rank the boars as they should be kept in a herd that profits mainly from the sale of seedstock to owners of rotational crossbreeding programs (Yorkshire and Hampshire hogs used in rotations). This is a criss-cross. You also produce your own replacements. You and your customers raise all hogs in total confinement.

The Yorkshire boars in this class are going to be used in a rotational breeding program with Hampshires. Yorkshires are used to improve the maternal and growth traits in the crossbreeding program. Hampshires are used to improve the carcass traits such as leanness and muscling. With this in mind, you should be able to logically place the boars from the performance data.

All hogs are raised in confinement, so soundness is a priority.

The priorities for this class of Yorkshire boars are: maternal excellence, growth, and soundness. The initial rankings based on the performance data is 4-3-1-2.

Boar 4 excels the class in 21-day litter weight EPD and number born alive EPD. He also has a favorable negative growth EPD. You would like to see Boar 4 with a better backfat EPD. However, he initially places first because of his outstanding maternal data. Boars 3 and 1 have similar performance figures and are acceptable in all categories. Boar 3 has a slight advantage in number born alive EPD, so he is initially placed over 1. But visual evaluation may change the final rankings.

Boar 2 has very poor EPDs for 21-day litter weight and number born alive. He has the worst growth and backfat EPDs and initially places last.

Remember that along with the maternal performance figures, underline quality it considered a maternal trait and needs to be a priority.

## Genetic Evaluations Yorkshire Boars

No.	Days to 230 lb. EPD (lb.)	10th Rib Fat EPD (in)	21-day Litter Wt. EPD (lb.)	No. Born Alive EPD
1	-1.4	-0.01	+1.5	0.00
2	+2.3	+0.03	-3.7	-0.60
3	-1.5	-0.01	+1.7	+0.15
4	-1.1	+0.02	+3.9	+0.60

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**Situation:**

**Chester White Gilts**

Rank the gilts as they should be kept in a seedstock herd that profits mainly from the sale of Chester White x Yorkshire F1 females to owners of terminal crossbreeding programs (terminal boars bred to Chester White x Yorkshire gilts). You and your customers raise all hogs in confinement. Your customers market all progeny on a value based system.

The Chester White gilts in this class are going to be bred to Yorkshire boars to produce F1 females that are going to be used in a terminal crossbreeding program. The F1 gilts will be bred to terminal sires. All progeny will be marketed on a value based system. Therefore, the F1 gilts must excel in maternal traits in order to produce large litters of fast growing market hogs.

Since the F1 female offspring will be expected to raise large litters, a high-quality underline should be emphasized along with the maternal figures. With the F1 gilts being placed in confinement, soundness is a priority. Even though the Chester White gilts will be used for maternal traits, they still must not cause a major setback in growth or leanness. The priorities for this class are: maternal excellence, soundness, and high-quality underlines.

The initial ranking based on the performance data and priorities is 4-2-3-1.

Gilts 4 and 2 excel the class in 21-day litter EPD and number born alive EPD. They are identical in their data except for the slight advantage Gilt 4 has in days to 230 pounds EPD. Their backfat EPDs are acceptable for this class.

**Genetic Evaluations Chester White Gilts**

No.	Days to 230 lb. EPD (lb.)	10th Rib Fat EPD (in)	21-day Litter Wt. EPD (lb.)	No. Born Alive EPD
1	-2.9	+0.04	+0.5	+0.00
2	-2.4	+0.03	+3.7	+0.60
3	+0.8	-0.02	+1.7	+0.25
4	-2.6	+0.03	+3.7	+0.60

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They need to be evaluated visually for soundness, muscle, underline, etc., to obtain a final class placing. Gilt 3 has the next best maternal EPDs and has the only negative backfat EPD. However, she has the poorest days to 230 pounds EPD. She initially places third. Gilt 1 has the poorest EPD for 21-day litter weight and number born alive. She places initially fourth.

**Situation:**

**Spotted Gilts**

Rank the gilts as they should be kept in a herd that profits mainly from the sale of seedstock to owners of terminal crossbreeding programs (Spot boars are crossed on Chester White x Yorkshire females). Your customers raise all hogs in total confinement and operate farrow-to-finish operations. All offspring are marketed on a value based system.

The spotted gilts in this class are to produce male offspring that will be used as terminal sires. The offspring of the boars will be sold on a value based system. Leanness and muscle are a priority in order to achieve high market premiums.

Maternal traits are not major selection criteria for the customer who buys the boars. However, there should be no drastic setbacks in maternal traits, since these gilts are replacements within a purebred seedstock herd and they need to be able to produce large, productive litters for the seedstock producer. Structural soundness is also a priority, as all hogs are raised in confinement. The priorities for the class are: leanness, muscle, growth, and soundness.

The initial rankings based on the performance data are 2-3-4-1.

Gilts 2 and 3 are similar in days to 230 pounds and backfat EPD, with negative figures which will improve their progeny. Gilts 2 and 3 need to be evaluated visually. Differences in muscle, soundness, structure, etc., will place this pair. Gilts 4 and 1 have contrasting performance figures. Gilt 4 has a favorable negative backfat EPD but has the only unfavorable growth EPD. Gilt 1 has the best growth EPD but also has an unfavorable backfat EPD. Therefore, in this pair you must use your skills of logic and compromise in combining the performance data with the phenotype of the gilt to place this pair.

## Genetic Evaluations Spotted Gilts

No.	Days to 230 lb. EPD (lb.)	10th Rib Fat EPD (in)	21-day Litter Wt. EPD (lb.)	No. Born Alive EPD
1	-2.9	+0.04	+1.6	+0.10
2	-2.1	-0.04	+1.8	+0.10
3	-2.0	-0.03	+1.6	+0.45
4	+2.6	-0.03	+1.6	+0.10

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