

Swine EPD Terminology

EPD- Expected Progeny Difference is the best estimate or indicator of a sire or dam's genetic potential. It is the actual differences in production a pork producer could expect from future offspring of the sire and dam. This numeric value can be positive or negative. A positive EPD is more desirable for the traits like number born alive (NBA), 21 day litter weight, and pounds of lean. A negative EPD is more desirable for back fat and days to 250 pounds.

Dam- The sow or mother of an animal.

Maternal- The act of being a mother, inherited from a mother, or related through a mother.

Reproductive Traits – Traits that measure how well a sow farrows and raises her litter. These traits include Number Born Alive, 21-day Litter Weight, and Number Weaned.

Parity- The number of litters a sow has produced.

NBA- Number born alive is a predicted value for each individual offspring. An NBA EPD of + 0.6 for a sow means you to expect her daughters to farrow 0.6 more pigs per litter than the average sow. The average sows NBA EPD would be 0.0 with a positive value being more desirable. Meanwhile, a negative value is less desirable and indicates less per litter than the average sow.

NAT- Number after transfer is the number of pigs the sow is raising after her litter has been equaled out between one or more other sows within the first 24-48 hours after farrowing.

NW- Number weaned is the number of pigs that a dam raised to 21 days of age, adjusted for parity, and the number after transfer.

LWT– The 21-day litter weight is the predicted value for an animal's progeny. This value is the expected 21 days litter weight of a Dam's offspring. A sow with a 21-day LWT of +3.8 should produce daughters who will produce litters that are 3.8 pounds heavier at 21-days than the average sow. The 21-day LWT, of the average sow is 0.0, with a positive number being more desirable. A negative is less desirable assuming the daughter would produce less than average 21-day LWT.

SPI- Sow productivity index is an indicator for a sow's reproductive traits. This index combines the NBA and 21-day LWT. The SPI also includes a sow's lifetime NBA and 21-day LWT data. The SPI of the average sow is 100 and any number greater than 100 is more desirable. Meanwhile, any number below 100 is less desirable and should not be selected, if possible.

Sire- The boar or father of an animal.

Terminal- Traits inherited or passed down from a boar or a related boar.

Days / 250 - The EPD for days to 250 pounds predicts the performance of the offspring of an animal. A sire with a days/250 EPD of -2.1 would be expected to produce offspring that would



reach 250 pounds 2.1 days faster than the average sire. The average days/250 EPD is 0.0, while a negative number is more desirable indicating the offspring will grow faster than the average. A positive number (greater than 0.0) is less desirable and indicates the offspring would grow slower than the average.

BF- Back fat is the actual individual animal's measurement for fat. This measurement is usually predicted with an ultrasound machine and is measured at the 10th rib. The BF value is measured in inches and can vary from 0.30 through 1.10 inches of back fat for an individual animal.

BF EPD- Back Fat EPDs predict the back fat of the offspring. A sire with a BF EPD of -0.06 would be expected to produce offspring that are 0.06 inches leaner than the average sire. The average BF EPD is 0.0, while a negative (-) number is more desirable and indicates the offspring produced will be leaner than the average BF EPD. A positive (+) value is less desirable indicating the offspring will be fatter than the average BF EPD.

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

LBS- Pounds of lean EPD is the amount of fat free lean meat adjusted to a 185 pound carcass. A boar with a LBS EPD of 2.0 is expected to produce offspring that generates carcasses with 2 pounds more lean than from an average sire. The average LBS EPD is 0.0, while a positive value is more desirable producing offspring with more pounds of eatable pork product. A negative LBS EPD is less desirable indicating a boar would produce offspring with less pounds of lean than offspring from an average boar.

Percent Lean- Is a standardized calculation to calculate each animal's individual percentage of lean meat in the carcass. Percent lean is calculated by:

$$7.231 + .437 \times \text{Hot Carcass Weight} = \\ +3.877 \times \text{Loin Eye Area} = \\ \underline{-18.746 \times 10^{\text{th}} \text{ Rib Back Fat} =}$$

This answer is the Pounds of Muscle which can be divided by the Hot Carcass Weight and then multiplied by 100 to equal the Percent Lean.

TSI- The Terminal Sire Index combines growth (days to 250 lbs), pounds of fat free lean (LBS), and back fat (BF). The TSI value is used to select boars to be used as terminal sire or as sires to be used in crossbred breeding programs. The average TSI is 100 and numbers greater than 100 are more desirable. Meanwhile, numbers less than 100 are less desirable for selection purposes.

ADG- Average daily gain is the average weight that an animal gains each day. It is calculated by subtracting the starting weight from the final weight and dividing this difference by the number of days on feed.

WDA- Weight per day of age is determined by taking the animal's actual weight and dividing by the age (in days) of the animal. WDA tells how fast a particular animal has gained since birth.

Feed / Gain – The feed to gain ratio is the pounds of feed consumed per pound of gain. An EPD for Feed/Gain is calculated from the EPDs for days to 250 lbs. and pounds of lean.



MLI- Maternal Line Index indicates the economic value of the progeny produced. The MLI puts twice the emphasis on reproductive traits (SPI) as it does on post weaning traits (TSI). The components of MLI are BF, days/250, LBS, NBA, and LWT. The average MLI is 100 and a value greater than 100 is more desirable. A number less than 100 is below average and is less desirable for selection purposes.

STAGES – Swine Testing and Growth Evaluation Systems provides producers of Duroc, Hampshire, Landrace, and Yorkshire hogs with performance records. These records utilize growth, back fat, pounds of lean, litter size, and litter weight to predict genetic values for each pig and its parents.



Comparing Data/Index/EPD's

Performance information can be presented in three main categories: reproduction, growth/performance, and carcass composition. The categories being presented can then be subdivided into three forms: individual data, ratios/indexes, and EPD's.

Performance Categories and Subdivisions:

Category:	Subdivision:		
	1.) Individual Data	2.) Ratio or Index	3.) EPD's
1.) Reproduction:	Number Farrowed Number Weaned 21-day LWT Teat Count	Dam's SPI Dam's Index	Number Born Alive SPI EPD MLI EPD
2.) Growth / Performance:	Average Daily Gain Weight / Day of Age Feed Efficiency	Gain Ratio NSIF Index F/G Ratio	Days to 250 lbs. TSI
3.) Carcass Composition:	Back Fat Scan Data LEA Measurement	BF Ratio	BF EPD TSI

Any one of the following performance categories or subdivisions can be represented in a scenario. It is very important for you to understand the differences between the performance types in a given scenario.

Individual data is the performance data for a specific animal and is usually represented by measurements. This data has only been compared to itself and no comparison has been made to other contemporary groups.

A ratio or index is calculated with the intent to compare it to other individual rankings or to compare it to its contemporary group. The contemporary group consists of other hogs of the same breed that we raise together in the same farm performance group. An index is created by combining the ratio from one or more traits. The majority of indexes have 100 as the average score for a specific index. Indexes that are higher than 100 are more desirable and considered above average. Meanwhile, indexes that are below 100 are less desirable and considered below average.

EPD's are used to describe how an animal's offspring will perform in comparison to another animal's offspring. Littermates will have the same reproductive EPD's because they are from the same dam and sire. The following data set is an example of littermate EPD's verses individual data.



EPD Gilt Class:

No.	21-Day LWT	NBA	SPI	BF	LEA
1	121	11	105	0.65	7.95
2	122	10	110	0.70	8.44
3	122	10	110	0.62	8.50
4	89	8	100	0.80	8.20

In this example EPD class, gilts two and three are littermates because they have the same SPI, 21-day LWT, and NBA. These gilts are from the same litter and thus, they have the same sow's productivity performance and same EPD's. In comparison, the individual data for BF and LEA for these littermate gilts are different. Once again, it is important to remember that individual data is based on the animal's individual performance.



Utilizing Performance Information in Judging Scenarios

Livestock judging utilizes techniques that can be applied to pork producers, packers, boar studs, coaches, 4-H enthusiasts, and educational programs. Understanding EPD's, scenarios, and performance information can be helpful in the selection of sires, dams, replacement females, designing crossbreeding programs, and determining when livestock are ready for market.

Judging contests have been designed to improve decision making, communication skills, visual appraisal, and the understanding of performance data. EPD's and the other performance data provided in a scenario are used to prepare livestock participants for realistic selection decisions.

In every scenario used in livestock judging, there are six basic steps needed to justify your ranking and decision making.

Before looking at the animals in the class do steps 1-4:

1. Understand the scenario, and class description.
2. Re-read (for the second time) the scenario, and class description.
3. Set up priorities for the particular class scenario or description.
4. Evaluate the performance information and rank the animals in the class off of the data alone.
5. Visually evaluate the animals in the class.
6. Combine the performance information ranking and the visual appraisal ranking for a final class ranking.

Step 1.

Prior to the class, each contestant should be given the scenario about the class. Ideally, the scenario should provide the class name, purpose for evaluation, production situation, and any marketing criteria for the class. It is important for each judging participant to obtain a copy of the scenario and read the material before judging the class.

Example Class Scenario:

Hampshire Breeding Gilts:

Rank these Hampshire breeding gilts as they should be selected in a herd that profits predominantly from the sale of terminal sire, plus a few show pigs. Your main customers operate farrow to finish operations and raise hogs in total confinement. All offspring are sold on a lean value marking system.

<u>No.</u>	<u>Litter Size</u>	<u>21-Day LWT</u>	<u>Days to 250 Lbs.</u>	<u>BF EPD</u>	<u>LEA</u>
1	8	80	179	+ 0.06	7.21
2	14	150	165	-0.08	9.11
3	5	41	168	-0.02	8.65
4	12	131	170	+0.02	9.20



Scenarios Should Include:

Name:

Hampshire Breeding Gilts.

Purpose:

Describes the scenario used for the Hampshire Breeding Gilts.

Selected by a herd that profits from the sale of terminal sires plus a few show pigs.

Raising show pigs is not the main selection purpose for this class. This information is just additional information added to the class scenario.

Production Conditions:

The production conditions describe the living conditions or environment for production.

Total confinement = cement / slatted flooring. Under these conditions, structural correctness is highly important.

Marketing Criteria:

The marketing criterion describes the plan for marketing the offspring produced.

The male offspring from these gilts will be sold as terminal sires. Thus, their offspring will be sold on a lean value marketing system.

Each scenario can vary in simplicity, depth, situations, and the materials presented.

These differences are based on the age and educational level of the contestants.

Step 2.

Re-read the scenario again to make sure you completely understand the class stipulations. Young, energetic livestock judging contestants tend to get excited and overlook important material being presented in the class. Re-reading the scenario will decrease the chance for contestants to make silly errors.

Example Class Scenario:

Hampshire Gilts:

Rank these Hampshire gilts as they should be selected in a herd that profits predominantly from the sale of terminal sires and a few show pigs. Your main customers operate farrow to finish operations and raise hogs in total confinement. All offspring are sold on a lean value marking system.

<u>No.</u>	<u>Litter Size</u>	<u>21-Day LWT</u>	<u>Days to250lbs.</u>	<u>BF EPD</u>	<u>LEA</u>
1	8	80	179	+ 0.06	7.21
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Step 3.

The class priorities may be given in the scenario. Older contestants may be required to set-up their own class priorities.

Priorities- describe the function the animal will serve in the given scenario or situation.

For example: in the Hampshire gilt scenario:

Terminal sires = growth, leanness, muscle, structural correctness.

Total confinement = structural correctness.

The selection priorities given in a scenario should never imply that they are the only selection criteria for the class. For example, if a gilt is lame or has an unacceptable underline; or a boar has a small testicle, this might indicate that they should be placed lower in the class. In some class scenarios, the wording says to judge the underlines as sound. This terminology is used so the contestants will consider the underline quality as equal.

In the Hampshire gilt scenario, the underlines should be evaluated even though underline quality was not listed in the class priorities.

Step 4.

Evaluate the performance data presented in the class scenario. Read through the performance data and make sure you understand each category. Identify the performance categories that best relate to the priorities in the scenario.

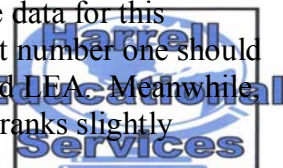
For example in the Hampshire gilt scenario: the priorities are growth, leanness, muscle, and soundness.

Rank the gilts with the individual data categories being provided: (ranking)

<u>No.</u>	<u>Litter Size</u>	<u>21-Day LWT</u>	<u>Days to 250 lbs</u>	<u>BF EPD</u>	<u>LEA (Overall)</u>	
1	8 (3)	80 (3)	179 (4)	+ 0.06 (4)	7.21(4)	= 4
2	14 (1)	150 (1)	165 (1)	-0.08 (1)	9.11 (2)	= 1
3	5 (4)	41 (4)	168 (2)	-0.02 (2)	8.65 (3)	= 2
4	12 (2)	131 (2)	170 (3)	+0.02 (3)	9.20 (1)	= 2

In this class, the highest priorities should be days to 250 lbs, BF EPD, BF, LEA. The lowest priorities for is scenario should be litter size, and 21 day LWT.

In the given scenario the overall ranking was based on the performance data presented. Gilts number one and number two sort themselves out in the class. Gilt two ranks first place based on days to 250 lbs and BF EPD. Additionally she has the second largest LEA. Her overall ranking would be first, based on her performance data for this scenario. Based on her performance data and the given scenario gilt number one should be placed fourth. She ranked fourth in days to 250 lbs, BF EPD, and LEA. Meanwhile, gilts three and four are fairly close on performance data. Gilt three ranks slightly



higher for days to 250 lbs, and BF EPD. Gilt four has a larger LEA than gilt number three. Although litter size and 21 day LWT are low priorities in this class, gilt number four is stringer in these traits than gilt number three. Gilts three and four should be considered a tie on paper and a final class ranking should be determined on visual appraisal.

Step 5.

Evaluate the visual traits of the Hampshire Gilt class. The priorities for breeding gilts include:

- 1.) Structural Correctness
- 2.) Volume
- 3.) Reproductive Traits

The main reproductive traits include the underline and vulva. Judge the class based on structural correctness, volume, and reproductive traits. Make a class ranking based on your priorities for visual appraisal.

Remember Step 4. and the overall ranking of the Hampshire gilts on paper.

No. Overall Ranking

1	=	4
2	=	1
3	=	2 *
4	=	2 *

Gilts 3 and 4 are tied on paper.



1



2



3



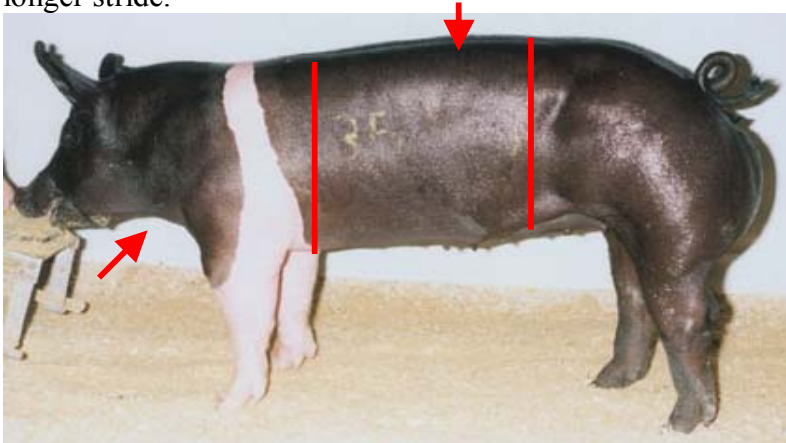
4



I placed the Hampshire gilts, 2-4-3-1 based on visual appraisal.

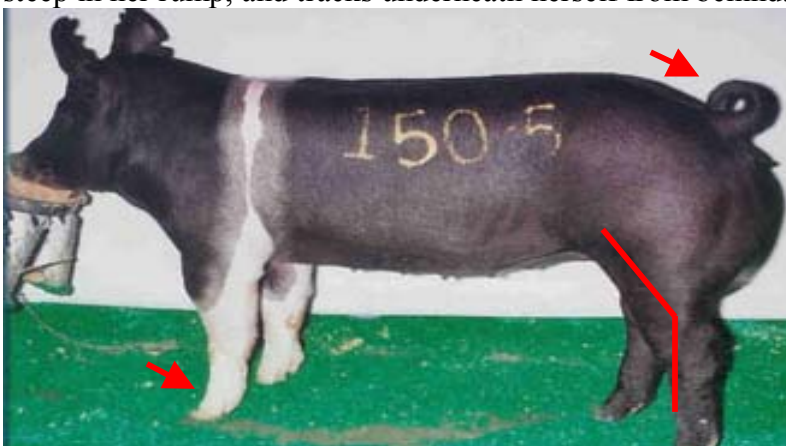
No.	Overall	Visual Ranking
1	=	4
2	=	1
3	=	3
4	=	2

I started with the 2 gilt as she best combines structural correctness, volume, and femininity to the highest degree. More specifically, she is a cleaner fronted, longer faced female that has a more correct angle to her shoulder. Furthermore she is longer bodied and has more width and dimension down her turned top. Additionally, she has a more desirable angle to her hock and rear pasterns, which allows her to move on a longer stride.



2

I realize the 4 gilt is longer and more feminine. She is also more up headed and has a more correct angle to her shoulder compared to 2. 4 stands down more correctly on her front toes, has a bigger forearm, and is heavier boned. However, 2 is low in her tail set, steep in her rump, and tracks underneath herself from behind.



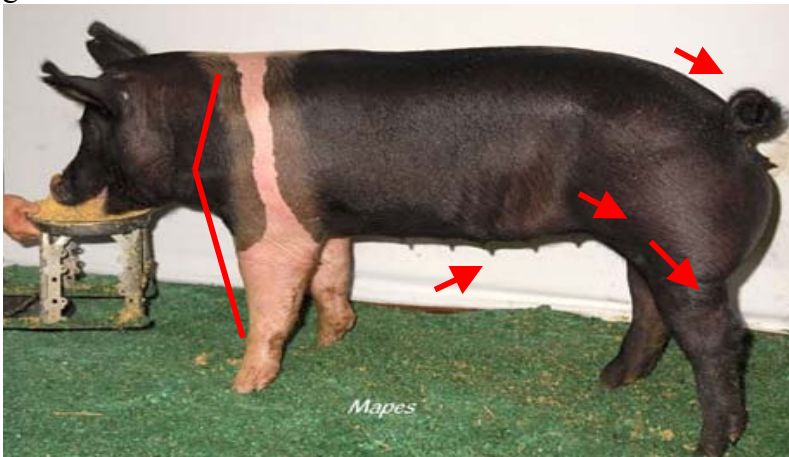
4

In the middle pair 4 places over 3 as she is more structurally correct and more extended. 4 also has more angle to her shoulder and is more correct on her rear legs. I realize 3 is a leveler designed gilt but, she is a light muscled gilt that is too straight in her shoulder and rear legs.



3

In the concluding pair, 3 beats 1 as she is wider made, broodier appearing gilt that has a more refined underline. I realize that 1 is longer and cleaner in the front one half of her body but, she is the shallowest bodied, lightest muscled, and most structurally incorrect gilt if the class.



1

Step 6.

Decide on the final placing based on your performance data ranking and your visual appraisal ranking. Often times the scenario ranking and visual appraisal ranking will coincide with each other. Sometimes decisions or adjustments need to be made in order to come up with the final placing. When the two rankings do not match, a compromise needs to be made in order to reach a final placing. In certain situations, the scenario will not match the animals in the class and contestants should make a final placing to the best of their knowledge. Visual appraisal usually prevails when a compromise is needed because the two rankings do not match.

No.	Overall Performance Ranking
1	= 4
2	= 1
3	= 2 *
4	= 2 *

Gilts 3 and 4 are tied on paper

No.	Overall Visual Ranking
1	= 4
2	= 1
3	= 3
4	= 2



Final Placing for the Hampshire gilts is
2-4-3-1

Reasons that combine the placing and scenario:

Leading off with the more scenario adaptable gilt that best combined structure, volume, and femininity to the highest degree, I placed the Hampshire gilts 2-4-3-1. In my top pair I placed 2 over 4, as she ranks higher in growth and leanness. She is a cleaner fronted, longer faced female that has a more correct angle to her shoulder. Furthermore 2 is long bodied and has more width and dimension down her top. Additionally, she has a more desirable angle to her hocks and rear pasterns, which allows her to move on a longer stride. I realize 4 is a bigger boned gilt that stands down more correctly on her front toes, but she needs to be more structurally correct off her rear legs and in the given scenario will have less longevity in a confinement environment.

In the middle pair of gilts that are similar on paper it's 4 over 3 as she is more structural correct and extended. 4 is more up headed, and has a more correct angle to her shoulder. She too, is longer from the point of her shoulder to her ham loin junction. I realize that 3 is a leveler designed gilt but she is light muscled and too straight off of her front and rear legs.

In the concluding pair, 3 beats 1 as she is more scenario adaptable, being higher volumed, and more refined about her underline. Three possesses more desirable EPD's for days to 250 lbs, back fat, and loin eye area. Thus, you would expect her to produce progeny that are faster growing and more packer preferred. Additionally 3 is wider chested and has more width and dimension through her rib. I realize, 1 is longer and cleaner in the front one half of her body, but she is the shallowest bodied, lightest muscled, and most structurally incorrect gilt in the class.

Thank You.

