

USING PERFORMANCE RECORDS FROM WHOLE HERD TESTING

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Introduction

Whole herd testing has taken place in Nebraska SPF herds since 1960 and it is still the largest on-farm testing program in the U.S. The program has changed over the past twenty years and it will change more during the coming years.

The overall goals in the Nebraska SPF program are to produce animals of superior health and performance and to provide a system of accrediting these animals with superior health and performance. These goals have remained constant and the only changes have been in the methods of evaluating swine.

The Nebraska program started with standardizing records to 154 days and 200 lbs. for backfat. This was changed to 140 days and 200 lbs for backfat. Since NSIF was established, Nebraska SPF has utilized age to 220 lbs. and backfat at 220 lbs. The initial indexes were calculated based upon weight and backfat. Presently, the indexes are calculated using age, backfat and litter size. In the near future Nebraska SPF will use estimated breeding values (EBV) for all traits and utilize as much relative information as possible.

On-Farm Testing Traits

The real question, today, is what do the producers do with the performance data? In order to answer that question, a few things must be presented as a base to work from.

Traits that producers can obtain with accuracy and ease are important (The Best Designed program won't work if the data is not collected.) I feel that most producers can obtain number born alive, number at 21 days and the 21 day weights. These will be accomplished because the producers are working with the pigs at these times.

An age to 220 lbs. and backfat measurements must be part of a mandatory on-farm testing program. Most people will object to two items here. First, we can debate what weight is an appropriate end point. I personally will not debate any end point of 220 lbs. or less. I will vehemently object to any end point greater than 220 lbs. Researchers have shown that gilts should not remain on full feed after approximately 200 lbs. Secondly to do whole herd testing you are asking the producer to expand his facilities, for no sound reason, to accomplish some objective that has little, if any, validity. I feel that it is too bad that NSIF has adopted an end point of 230 lbs. when the on-farm committee recommendation was lower and

also since most of the people deciding never did whole herd testing. University professors are criticized for their lack of practical application. This time I can proudly say that producers and breed associations have even less application than most professors but have chosen to call themselves experts in on-farm whole herd testing.

Why mandatory? Too often producers can decide not to weigh and probe their hogs due to their busy schedule, because the hogs haven't grown very fast or because their favorite sire's pigs aren't performing as good as some other pigs. It is also very easy for producers to weigh only part of their herd rather than the whole herd if you do not have a mandatory program. Many people from other states and countries have asked about the Nebraska whole herd testing and how it has managed to remain a whole herd program. My answer is this: You can have a successful program if it is mandatory to test all animals. You cannot have a good program if you let each producer decide what he wants to do and how he wants to do it.

Feed efficiency is a trait that could be obtained on a lot of farms. Too often people ignore feed efficiency data collected on a farm. Errors in measurement are quite easily realized and generally feed efficiency must be collected on groups of animals. I feel that feed efficiency should be considered for any new facilities but I also believe we can select the more efficient pigs through growth and backfat measurements.

I also believe that most producers can keep conception records and that they should maintain these records rather than farrowing interval. Farrowing interval is essentially the same, except that you keep sows in the herd for four extra months before you realize she didn't breed until her third estrus post weaning.

When to Use Records

Almost every operation can cull their sows at weaning if they are utilizing a sow productivity index (SPI). This allows producers to reduce their overhead; it also lets the producers select the best sows based upon statistics and not just on visual appraisal.

Approximately, 25% of the sows in each group should be culled at weaning. Boars should be culled based upon their average number born per litter.

At five months of age, replacement males and females should be selected. This selection should be done based upon a calculated index incorporating several traits or based upon an EBV. There is no room for deviation from this index. After selections are made on paper, then observe the animals and cull for all or none traits.

Breeding time is a good time to cull sows and boars. Sows should rebreed on first estrus post weaning and gilts should be bred ONLY twice. Boars must breed and settle 90% of exposed females. This is a critical part of a whole herd program. Producers should not tolerate slow breeders or non-settling animals.

Selection Methods

I have been trained by some of the best geneticists to have confidence in individual (or mass) selection. Family selection is generally less effective than individual selection. For traits of very low heritability, family selection may increase the accuracy of selection.

Utilize an index in all selection programs. Single trait tandem selection is a much slower method of improving herd performance. In most herds the problem observed is one of inconsistency. The breeder does too much tandem selection and consequently he is unhappy with his progress in the economically important traits.

Selection of animals on paper is the first stop in any selection program. If the animal can't produce, don't be misled to think that this was a mistake. The REAL mistake will be when you select that animal as a replacement for your herd. After you have ranked the top animals on paper, go out and evaluate the animals for soundness and underlines. Failure to do this in that order can result in ignoring some animals that should have been selected.

Purchasing New Genetic Material

First, I want to show you an animal that was an example of productive hogs. This herd had large litters, good growth rate and very lean hogs. The breeder was noted for his excellent herd. But, thanks to the shows of our great country, this producer now has small litters, average growth and fatter hogs. Producers are trying to listen to visual evaluations and consequently, they are regressing backward.

Why? As I mentioned earlier, the tandem selection doesn't allow for a consistent emphasis on all traits. New genetic material is purchased only on type. Generally, there is no performance data available on the individuals.

If limited performance data is available on the individuals, there is no data on relatives and contemporaries to help evaluate genetic net worth.

Genetic Improvement

Our real purpose in on-farm whole herd testing is to evaluate the genetic net worth of an animal and to determine what we can do to maximize genetic progress in future years.

Genetic progress per generation is simply the selection intensity times the standard deviation of a trait times the heritability. To obtain the expected genetic change per year is merely dividing the expected change per generation by the number of years it takes to replace one generation.

Generally, the generation interval has the greatest influence on the expected genetic change per year. In swine, the optimum generation interval should be around one year. The selection rate for females is then one out of four and the selection rate for males is one out of sixty assuming one boar for every 15 females.

The selection intensity is then approximately one and three-fourths standard deviation. This method will give you the largest genetic change per year and it will allow you to see some phenotypic changes within five years.

Whole herd testing is designed to help producers achieve maximum genetic change through selection of animals that are superior to their contemporaries. The whole herd testing and record utilization also will help producers define their goals and allow for a consistent method of selection. This type of program will help keep selection programs based upon economically important traits.

There is one very simple solution to implementation of on-farm testing. Keep the traits measured simple, meaningful and realistic. If all of you could remember just that much, then my time was not in vain.