Performance of Gilts Bred at Various Ages Following Estrus Induction

Technical Report No. 10

Summary

Data from 312 gilts bred at ages ranging from 24 to 40 weeks were studied to examine the effects of age at breeding on litter and sow traits following estrus induction. Gilts were administered 400 I.U. Pregnant Mare Serum Gonadotropin (PMSG) plus 200 I.U. Human Chorionic Gonadotropin (HCG) while being simultaneously moved, mixed and exposed to boars to stimulate first estrus. Approximately 80 percent of gilts responded to synchronizatlon and were bred. Of those gilts that conceived, total pigs born, pigs born alive, and birth weights increased as gilts were bred at older ages. Gilts bred at 24 to 26 weeks of age had about 1.2 less total pigs born and 1.3 less pigs born alive than those bred at 30 or more weeks of age. No significant difference existed for age at first breeding on days weaning to cycling, number born, number born alive or litter birth weight.

Results from this study show that gilts can be bred successfully as young as 6 months of age. However, the reduced litter size from young gilts should be balanced against the advantages of reduced gilt pool numbers, better synchronization and less days in the breeding herd to determine its feasibility for each swine herd.

Introduction

Records from commercial swine herds show an annual culling rate of 30 to 40 percent. Thus, pork producers must continually add a sizeable number of gilts to the breeding herd. These gilts usually cause a great loss in breeding herd efficiency due to their lower conception rate, reduced expression of estrus, lack of heat, poor timing of heat and a litter size of 1.2 pigs per litter less than 3 to 6 parity sows. As herds become larger and more confinement oriented, these problems seem to become magnified as a result of confinement breeding. Many herds must maintain a large gilt pool (3 times the number to be bred)in order to get adequate numbers in heat so that they fit into scheduled breeding groups.

Pork producers have searched for a means of estrus synchronization, estrus scheduling and induction of estrus when gilts are added to the herd. A product called Regumate® has been shown to provide these benefits but is still awaiting FDA approval and is not presently available for use. Another product, PMSG or pregnant mare serum, has shown some promise for induction of heat in noncycling gilts. However, when used by itself without other stimuli, variable results have occurred.

Procedures

This study utilized several proven methods to induce cycling in gilts. Since there can be as many as 90 percent of the gilts in a confinement finishing facility that do not cycle up to an age of about 7 months, these gilts are good candidates for induction of first heat. Boar exposure, mixing and moving of gilts have been shown to be factors contributing to gilt cycling. In this study, gilts were raised in a confinement finishing facility until reaching the age of 6 to 8 months of age. The gilts were then simultaneously mixed, moved to the breeding area and exposed to boars. In addition, gilts were injected intramuscularly with a mixture of 400 I.U. of PMSG and 200 I.U. of HCG, This study was done at a large commercial swine farm. Gilts were bred on the first heat following treatment to farrow at ages ranging from about 10 to 12 months of age. The objective of the study was to compare performance of gilts bred at 6 to 6.5 mon[hs of age with those bred at an older age after PMSG and HCG treatment.

Results and Discussion

Performance results of the induced first litter gilts are shown in Table 1. Eighty percent of treated gilts cycled and were bred. The majority of the gilts cycled 4 to 7 days after treatment.

Data from 312 gilts bred at an age of 24 to 40 weeks were analyzed to determine the effects of age at first breeding on reproductive performance. Gilts bred at 24 to 26 weeks of age had about 1.2 less total pigs born and about 1.3 less pigs born alive than gilts bred at 30 or more weeks of age. There was a significant linear age effect for number born, number born alive and litter birth weight indicating that gilts perform better as they are bred at an older age. The quadratic effect of age on these traits was not highly significant but indicates that gilts reach a plateau for total number of pigs born and pigs born alive at about 30 weeks of age. Thus, the producer would have to accept smaller litter sizes as the trade off for getting gilts bred and into the herd at younger ages. However, breeding gilts at younger ages would increase feed savings, reduce the need to maintain a large gilt pool, and provide better scheduling of farrowings.

Another important objective of this study was to determine the rebreeding ability and future sow productivity of gilts bred at young ages. Table 2 shows the reproductive performance of these sows for their second litter.

No significant difference existed for the effect of age at first breeding on days from weaning to cycling, number born, number born alive or litter birth weight for these sows on their second litter. Thus, the detrimental effects on litter size from breeding gilts at a young age do not hold true for second litter performance. Furthermore, ability of sows to cycle postweaning was not a problem. Perhaps the gilts had additional time during lactation and during the second pregnancy to add to body reserves and prepare for their second litters.

This study shows that gilts can be successfully bred at a young age. The feasibility of this management practice for the pork producer is related to the economic comparison between maintaining a gilt pool with approximately three times the number needed vs. inducing and breeding young gilts at first heat after reaching 6 months of age.

P.G. 600®

Alternative 1.

(Gilt pool maintained 60 days.)

Feed, labor, overhead @ $0.8O/day

60 days cost = $48.00

Returns if 1.3 extra pigs = $20.00

Cost = $18.00

Alternative 2.

(Hormone induced estrus and bred at 6 months.)

Feed, labor, overhead @ $0.80/day 10 days cost = $8.00

Hormones = $4..00

Cost: $12.00

The costs appear to be in favor of the gilts bred at a young age. However, since more gestat[ion feed will be required for the young gilts, the two programs probably are near equal in cost or returns. Producers should balance the returns from a larger litter size with the older gilts against the more effective use of facilities, better scheduling and lowered labor requirements for heat checking with using PMSG and HCG to induce cyclng in young gilts. The unanswered question related to this management practice is that of sow longevity. However, this study shows the breeding of young gilts via hormone administration is an effective way of programming gilt breedings and for eliminating the large gilt pool often needed to find cycling females to fit into breeding groups.

Table 1.

Reproductive Performance of First Litter Gilts Induced to Cycle at 24 to 40 Weeks of Age

Age/Weeks	Number	No. Born[a,b]	No. Born alive[a,b]	Birth Weight
24-26	39	7.77	7.13	20.7
27-29	110	7.95	7.71	22.3
30-32	87	8.97	8.45	23.5
33-35	39	8.84	8.19	23.7
> 36	43	8.98	8.56	25.6

[a]Linear effect (P < 0.01)
[b]Quadratic effect (P < 0.10)

Table 2.

Reproductive Performance of Sows During their Second Parity when Induced to Cycle at Various Ages at First Mating

Age at First Breeding	Weaning to Breeding Interval	No. Born	No. Born Alive	Birth Weight
24-26	12.1	9.00	8.90	29.3
27-29	13.7	8.72	8.46	27.0
30-32	12.1	9.33	8.90	27.1
33-35	12.3	10.40	10.00	32.4
> 36	11.2	8.87	8.61	27.1

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