Managing the Gilt Pool: Pork Industry Handbook
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pork industry handbook

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Managing the Gilt Pool

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The gilt pool is a group of young females selected as potential brood sows. The term does not refer to a location or facility but rather to the idea that a number of virgin females are available to be bred when in estrus. In any farrowing operation, the number of farrowing crates to be filled is a fixed amount. The number of sows in those facilities is also fixed but will be reduced during rebreeding by culling infertile, unproductive or unsound sows. Periodically, replacement gilts are needed to complete each farrowing group and ensure that a pregnant female will fill each crate by a preplanned schedule. An efficient manager makes the best use of his gilt pool to fill vacancies in the sow herd. In fact, farrowing house vacancies indicate less than optimal use of the gilt pool.

Genetic upgrading of the breeding herd also depends on the use of potentially more productive females in the place of culled sows. The gilt pool should provide a source of females to ensure the most efficient use of the farrowing house and to improve the genetic potential of the female element of the breeding herd. Guidelines for selecting replacement females are given in PIH-27, "Guidelines for Choosing Replacement Females."

Management of Developing Gilts

Producers are aware of the need to selectively mate the more prolific sows to boars selected to produce gilts with greater genetic potential for maternal traits. Growth rate and carcass composition may not be as important in boars (gilt line) chosen to sire more prolific daughters. Boars of white breeds are more popular for this purpose, whereas boars from colored breeds are generally more desirable for siring pigs destined solely for market (terminal cross). Thus, the commercial producer must use two different kinds of boars if he wants to increase the selection pressure for genetically upgrading his replacement females.

Research results show the important effects that the rearing environment has on gilts in regard to their reproduction level. Gilts reared in litters of 5 or 6 pigs tend to be more fertile dams or show more maternal traits than gilts reared in litters of 10 or more pigs. More milk is available for each piglet and competition is reduced, resulting in faster growth. Therefore, producers may want to reduce the litter size to 6 or less in litters containing possible replacement gilts by cross fostering the barrow siblings to sows nursing piglets destined for slaughter. This practice requires no additional costs since there are usually more teats than pigs in most farrowing units. These gilts can also be kept in smaller groups through the growing and finishing phases for better management and observation. The social environment from weaning up to puberty does not appear to be as critical. However, as gilts reach puberty, crowding or lack of contact with a boar may delay the first estrus. Very early life and just prior to puberty are two periods of development that require special management and housing to encourage increased fertility in gilts. Contact with a boar and relocation to pens with more space per animal are ways of inducing and synchronizing estrus in some gilts at or near puberty. The synchronizing of estrus in about half of the gilts is a recognized result of this treatment, leading to acceptance of this management procedure for introducing gilts into the breeding herd. This means that gilts can enter the gilt pool at approximately 6 mos. and with a weight of 220 lbs. or more. Most producers routinely select replacement gilts at market weight and age.

Research work at several universities and practical experience show that contact with a boar is the most effective method of inducing estrus in confinement gilts. Use of hormonal therapy, such as Pregnant Mare Serum (PMS) or Gonadotropin Releasing Hormone (GnRH)(both not cleared by FDA for use in swine), are definitely not recommended as management tools for inducing estrus because of the poor conception rate and the possibility of masking genetic causes of infertility and low productivity. On the other hand, if hormonal compounds are cleared for use as tools to synchronize estrus, swine producers could work gilts into the breeding herd with much less effort and concern about selecting less fertile animals.

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Stressing gilts by withholding feed and/or water or abusing them in other ways is not a good method for inducing estrus. Providing a positive stimulus, like contact with a boar or more space per animal, perhaps in outside lots, is helpful in encouraging gilts to cycle.

How Many Gilts in the Gilt Pool

Season of the year, disease, environment, age, and genetic makeup influence the number of females showing estrus and conceiving at a particular time.

The number of replacement gilts needed to complete a farrowing group must be determined in advance. Choose that number by examining previous records for the same season. Under normal conditions, about 15-30% of the weaned sows are culled when minimum turnover is practiced. Past records and experience are the best indicators of the required number of replacement animals.

When determining the number of replacement gilts needed, use a gilt conception rate of 60%. Although most producers reach a higher rate of conception, an estimate of 60% is good insurance, especially during problem breeding periods.

Select at least three replacement gilts for each farrowing crate to be filled. During problem breeding periods (hot weather, disease or infertile boars), the number of gilts needed to insure one pregnant gilt at the desired time doubles or even triples. The more gilts in the pool at any one time, the greater the chances of obtaining more than enough pregnant females on a predetermined schedule. Further selections can then be made from bred or pregnant replacement gilts for other desirable traits.

The breeding system being used, such as pen mating versus hand mating, will have some bearing on the number of gilts in the gilt pool. When a pen mating system is used, the breeding period and thus the farrowing period are usually longer. Less control is used to eliminate females that do not breed in a short period of time. The same objective, a large percentage of all females farrowing within a week, is shared by producers using either system. The best way to handle farrowing problems and transfer piglets to balance litters is to farrow all females in the shortest time period. This is achieved by breeding females at or near the same time. Producers who hand mate are more aware of expected farrowing dates. Those who use pen mating can accomplish the same goal by exposing more gilts during breeding for a shorter period of time and using some pregnancy determining system to cull open gilts. As a result, about the same number of replacement gilts is required in the gilt pool to yield the greatest number of pregnant females in the shortest time.

Time Females Spend in the Gilt Pool

Keeping gilts that fail to cycle in the gilt pool for more than 3 weeks is not recommended for several reasons. Any gilt that does not cycle within 3 weeks of being placed in the gilt pool is less productive than those which do cycle in that time period. If gilts are kept in the pool beyond 3 weeks, selection to reduce average age at first estrus will not be successful and a greater number of less fertile gilts will be allowed to enter the breeding herd. Also, feed costs increase rapidly because non-cycling gilts must be fed and maintained in order to identify the few extra cycling gilts, thus reducing the efficiency of facilities and labor. Consequently, all non-cycling females should be removed from the gilt pool after 3 weeks of exposure to a boar.

If gilts are needed in the breeding herd to complete a new breeding group every week, the gilt pool can be divided into 6 pens for easy management. New gilts are moved into one of the first 3 pens each week. Estrous activity is checked daily and all cycling gilts can either be mated and moved to gestation facilities or can be moved to one of the next 3 pens to be mated on the next cycle. A different pen of gilts should be emptied each week. Gilts not detected in estrus in the first 3 pens by the end of 3 weeks should be sold. Only cycling gilts should be moved into the next 3 pens, and they should be in estrus on a predetermined schedule. Gilts can be mated when first identified as being in estrus or can be held for 3 weeks for breeding, thus providing more flexibility in the number of cycling gilts for breeding during any one week. This approach works nicely in managing the gilt pool, since gilts and sows normally have a 3-week estrous cycle and every cycling gilt can be identified during her initial period in the pool. The first 3 pens contain gilts that are being checked for estrous activity. The second 3 pens contain cycling gilts waiting to be mated, grouped by week according to the stage of their cycle.

For producers farrowing less frequently, the same concept can be applied by using 2 pens or multiples of 2 pens. Replacement gilts are selected and moved to one pen about 24 days prior to the desired breeding period. Estrous activity is checked daily and gilts cycling during the first week are moved to the second pen. The remaining gilts are then sold. Thus, gilts to be bred 21 days later are mated by the second heat period. This approach requires a greater number of gilts in the pool than if all gilts cycling during a 21-day period could be considered for the breeding herd. Using a larger number of gilts for a shorter period of time in the gilt pool more than offsets the greater pig loss at farrowing because of a greater range in farrowing dates. Piglets born 18 to 21 days late in a farrowing group have a lower survival rate and slower gain. The opportunity for balancing litter size by cross fostering is greatly reduced and utility costs per pig weaned are higher if sows and gilts farrow over a long period of time. Proper use of the gilt pool greatly increases the efficiency of the farrowing facility and labor inputs if farrowing is completed in 1 week or less.

Reducing the breeding period in a pen mating system to no more than 10 days greatly improves baby pig management at farrowing. Maintenance of a larger number of gilts in the pool for a shorter time period is necessary if the farrowing period is to be reduced since the breeding date is not known. This cost is offset by reduced labor that would be required in a hand mating system.

Regardless of the frequency of farrowing groups entering the farrowing facilities and the breeding system being used, producers should strive to farrow all females in one facility within 1 week. The cost of maintaining a larger gilt pool is more than offset by improvements in piglet health and piglet survival if they are born at about the same time. The all-in all-out management practice can be achieved with wise use of an ample number of gilts in the pool, thus preventing any female from farrowing as much as 2 or 3 weeks later than the first group in any one farrowing room.

Summary

Effective use of the gilt pool can greatly influence the reproductive efficiency of the breeding herd. The number of pregnant replacement gilts needed can be determined from previous records. There should be 3 or 4 gilts in the gilt pool for each pregnant gilt required. It may be necessary to double the number of gilts in the gilt pool during problem breeding seasons.

Consider season of the year, boar contact, relocation and mixing with new penmates when trying to upgrade the gilt pool. Combine management techniques to the best advantage, such as boar contact and relocation, with introduction of gilts into the gilt pool. Cull all non-cycling and late-maturing gilts after 3 weeks in the gilt pool.

After mating, select bred gilts that have sound production characteristics—first priority should be whether or not they cycle and become pregnant at the right time. Then consider feet and legs, underlines, parentage, temperament and other factors.