pork industry handbook

MICHIGAN STATE UNIVERSITY EXTENSION

Managing Sows and Gilts for Efficient Reproduction

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The goal of the workplace is to minimize the amount of time (labor) spent on each production level. For pork producers this translates into reducing the time spent on each animal unit. However, significant problems can develop without being detected if too little time is spent with the animals. Reproduction is the cornerstone of the entire production scheme. If high efficiency and profitability are the objectives, then skimping on time spent with the breeding herd will quickly show up as decreased conception rates and lower litter size at birth. In order to achieve maximum reproductive efficiency, a high level of management effort has to be expended on the breeding herd. Good management of females in the herd will pay dividends by increasing the number of live pigs farrowed and marketed. Our purpose in this fact sheet is to identify important points in the reproductive life of sows and gilts which must receive adequate attention if a high rate of productivity is to be achieved.

Prebreeding Management

Gilt Management. Selection of females for replacement is only the start of managing for highest reproductive efficiency. Gilts should be selected from family lines that have superior mothering ability (see PIH-27). A good indication of the female's ability to function normally is cycling at an early age. Gilts may start cycling as early as 4.5 months of age (Table 1). Mixing or regrouping gilts (with boar contact) at about 160 days of age can help synchronize and advance the date of first estrus, especially when they are raised in enclosed facilities. Those not cycling after 3 weeks of heat checking should be remixed to stimulate estrus. This may help synchronize the first heat and, to a lesser degree, the second heat.

Table 1. Average time for puberty, estrus and ovulation in swine.

Age at puberty	4.5-6 months
Weight at puberty	150-230 lb
Duration of estrus	2-3 days
Length of estrous cycle	18-24 days (20-21 avg.)
Weaning to estrus	3-7 days (5 avg.)
Time of ovulation	35-40 hours* (after onset of estrus)

* gilts sometimes at 24 hours, but not normally

The general recommendation regarding age at first breeding has been to wait until the third heat to take advantage of any increase in ovulation rate. A better criterion may be to breed gilts as they reach 230 lb to 240 lb body weight. Reproduction involves propagation of the species, therefore, if a gilt is below mature body size and becomes pregnant, she will stop growing and divert nutrients normally used for growth to support the pregnancy. Furthermore, if a gilt milks heavily, this compounds the problem of nutrient depletion of her body. The result is a first-litter gilt that fails to rebreed and initiates a poor reproductive future at best. In swine units where the breeding groups are in enclosed facilities, gilts not bred at first heat may stop cycling. It is recommended that gilts not reaching puberty or the appropriate breeding weight by 7 months of age be culled from the breeding herd. Therefore, the decision to breed on first or third heat should be based on more factors than the

possibility of increasing ovulation rate by one or two ova, such as maintaining a farrowing schedule; cost of feed, labor and facilities; salvage values of cull breeding stock; market expectations; etc.

Seasonal differences in age at first heat are a widespread problem. In general, fall-born gilts reach puberty at a lighter weight and at a younger age than spring-born gilts. Boar exposure decreased age and weight at puberty in spring gilts, but not in fall-born gilts. In a Canadian report, an average of 9.7% of the gilts weighing 195 lb to 200 lb that were slaughtered from June through September had reached puberty; whereas, an average of 22.8% of gilts slaughtered from January through June had attained puberty.

Anestrous conditions (absence of standing heat) may be the result of a number of conditions:

1. Faulty heat detection
2. Hot weather stress
3. Silent heat (ovulation with no visible sign of heat)
4. Sickness
5. Nutritional deficits (lack of protein and/or energy)
6. Social stress
7. Pregnancy

Sow Management. Sows occasionally come into heat while their litter is still nursing, especially if lactation lasts beyond 4 weeks. If a sow does express heat while she is nursing, she most likely will not return to heat before 3 to 7 days postweaning. Selection for sows that do cycle within 7 days postweaning is very important to keep management schedules running smoothly. Early return to heat should be a prime consideration for retaining sows in the breeding herd. This criterion automatically selects a female capable of successfully contending with the stresses of living in a particular environment. If a sow fails to conceive within 28 days postweaning, she should be culled. This is enough time for her to have been in estrus twice. With each 21-day delay, the sow must produce one to two extra pigs just to pay for the additional labor and feed. Similarly, if cycling gilts do not conceive after three estrous cycles, they should be culled so as not to increase the number of "hard breeders" in future generations.

When adequate nursery facilities are available, weaning is recommended at 3 to 4 weeks of age so the sow can be returned to production as soon as possible. Results of a study conducted in England show a decrease of about three pigs per litter when sows were weaned and bred before 21 days of lactation. However, new research indicates that weaning piglets at 10 to 14 days of age can be successfully done without jeopardizing their ability to grow efficiently given that adequate facilities and management are available. If weaning this early is adopted, it will place even more intense pressure on producers to do a better job of managing the breeding herd since the weaning-to-estrus interval may become erratic with a range greater than 3 to 7 days.

Weaning groups of sows at an average litter age of 3 weeks usually is a good practice to follow. Heavy-milking gilts mobilize minerals from their skeletons to facilitate lactation. In particular, the pelvic arch seems to be an area of frequent damage, with a vertical fracture commonly occurring. This damage occurs most frequently within two to three days postweaning. At this time, weaned females are most apt to fight as new social groups are formed. To prevent sow breakdown, make sure the lactation ration is properly fortified with minerals. In addition, provide dry pens with plenty of space and the best possible footing to prevent slippage. Put small or thin females into small groups of their own. Also, the use of individual stalls will reduce the incidence of injuries.

When postweaning scours are a problem, postpone weaning for several days if possible; and leave the litter in the farrowing area for an additional 3 days so the pigs are forced to start eating dry feed. This also requires that fresh palatable feed be continuously available to the pigs. Sows in thin condition should be on a high plane of nutrition and in a weight-gaining status before breeding. This will assure maximum ovulation rate as far as nutrient intake is concerned.

Synchronization of heat in sows is a relatively simple matter. When litters are weaned from a group of sows at the same time, a high proportion of sows that are in good physical condition should come into heat within 3 to 7 days postweaning. Adequate boar power is critically essential to take advantage of synchronization of postweaning heat. If sows do not return to heat during this time, analyze the production system and try to determine why. At the very least, reevaluate selection criteria and consider culling those sows failing to return to estrus within 7 days postweaning.

Effect of High Temperature. High temperature (above 85° F) will delay or prevent the occurrence of heat, reduce ovulation rate and increase early embryonic deaths. Michigan studies showed that gilts exposed to 104° F for 2 hours daily from 1 to 13 days postbreeding reduced embryo survival by as much as 35% to 40%. Other studies at Illinois and Oklahoma show similar results from heat stress. Based on numerous farm records of conception rates, the number of boars used and females kept in the breeding pool should be adjusted, especially in the hot months. See Table 2 for suggested female adjustment factors. Animals also suffer similar stress from high body temperature when they get sick and have a fever. More variation in the length of standing heat can be expected due to hot, rather than cold, weather. High relative humidity makes it uncomfortable, but the greatest problems a producer will encounter during the summer months are brought on by high temperatures and decreasing day length. High night-time temperatures compound heat stress problems. Again, selecting replacement breeding stock that are reproductively efficient will help minimize the effects of heat stress.

The main effects of heat on the boar's reproductive capacity are decreased sex drive and lowered normal sperm output, resulting in decreased fertility. If rectal temperature increases as little as 1°F (normal is 101°±1°F)for 72 hours, sperm production may be decreased by 70% or more. Once sperm production is affected, normal numbers of fertile sperm are not attained for at least 6 to 7 weeks (See PIH-87).

Breeding Management

Heat Detection. Heat is the time the female accepts the male for mating. However, not all females will readily accept a boar's advances and may not show the outward signs typical of estrus. Remember that the boar is a trial-and-error breeder. If a female stands still long enough, a boar will attempt to mate regardless of her heat status. Heat detection is more effective in the presence of a sexually mature boar (by placing the boar in the pen or at least in fenceline contact with the females).

Table 2. Suggested coefficients to determine the number of females to be bred each month.[a]

Month	Coefficient
January	1.25
February	1.28
March	1.35
April	1.43
May	1.52
June	1.64
July	1.69
August	1.70
September	1.52
October	1.35
November	1.30
December	1.25

[a]Number to breed each month = (number of farrowing stalls) x (coefficient).

However, the producer himself should then apply back pressure to each female in the presence of the boar. Nearly all females that are in "standing heat" will allow someone to sit on their back. Most sows or gilts in heat will respond by standing solidly and attempting to stiffen their ears, making them erect (called "popping-their-ears"). If they do not stand solidly and pop their ears, they are not in heat. In gilts, the vulva may be swollen and/or nervousness may be noticed, particularly before, but also after, standing heat. Good systematic heat detection with records is critical for achieving a high pregnancy rate. Faulty or inconsistent detection is a major cause of fertility problems. Abnormalities in the estrous cycle length do occur. Gilts will sometimes have less than a two-day heat period. If this happens, they most likely ovulate shortly after going out of heat. If short heats occur, gilts should be bred as soon as they are detected in heat and each succeeding 12 hours that they will stand. When estrus lasts longer than three days, chances are females may not conceive; so it is probably a waste of time and boar power to continue to breed her after the third day. These females should be culled if they return to heat. Without records of heat dates and lengths, you will never know when this happens or its frequency.

The all-important factor in achieving a high conception rate and good litter size is to get sperm into the female's reproductive tract at the time when pregnancy rate and litter size will be maximized. Regardless of the method of breeding (i.e., pen mating, hand mating, artificial insemination (AI)), an adequate number of live sperm must be in the tract a few hours before ovulation occurs or conception rate and litter size will be reduced. Figure 1 shows the effect on conception rate of breeding at various times relative to the time of ovulation. Notice that when heat lasts 48 hours a female will ovulate 8 to 12 hours before the end of standing heat or 36 to 40 hours after its onset. When mating occurs too early or too late, conception rate and litter size drop dramatically.

The general recommendation for optimal breeding time is based on the number of times per day a producer checks the female for signs of standing heat. With once-a-day heat detection, breed the females each day they will stand. With twice-a-day detection, breed at 12 and 24 hours after they are first detected in heat. Heat detection should always be done in the presence of a boar to maximize the chances of detecting all possible females in heat. This applies specifically to producers using hand breeding or artificial insemination.

Producers using unobserved (pen) mating must have plenty of boar power available. This is the first limiting factor in maintaining good pregnancy rates. For every 10 sows, use one mature boar (over 1 year of age) per 21-day breeding period. Decrease that ratio to 4 to 6 sows for each young boar (less than 1 year). A sow-to-boar ratio of 4 to 1 for mature boars and 2 to 1 for young boars is recommended when sows are weaned in groups. Reducing the breeding period in a pen mating system to no more than 7 to 10 days simplifies baby pig management at farrowing, but there is a high probability that only 85-89% of the sows will cycle within that period. Unbred females may be culled or carried over into the next breeding group. Maintenance of a larger gilt pool for a shorter time period is necessary if the farrowing period is to be reduced since the breeding dates

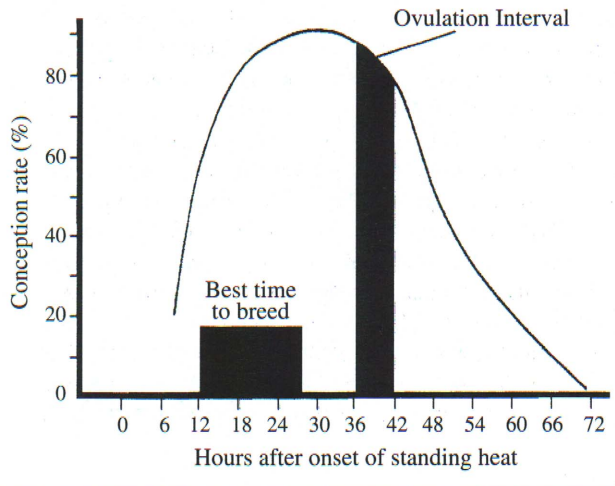

Figure 1. Effect of time of insemination on conception rate in swine.

are not known. Although this cost is offset somewhat by reduced labor that would be required in a hand mating system, more time is required for farrowing. Gilts should be visually checked twice a day for evidence of breeding and records of heat dates should be kept.

When hand mating, even the mature boar should not breed more than 2 females a day if he is to be used for more than 2 consecutive days, since his sex drive and sperm reserve will decrease rapidly. Artificial insemination is extremely useful since it is possible to breed 10 or more sows with the sperm harvested from one ejaculate (see PIH-64). A producer can have fresh semen delivered ready to use quite conveniently in many parts of the country. If done properly, there should be no decrease in conception rate and litter size with fresh semen. Using individual stalls during the first 30 days of gestation will significantly increase litter size, and possibly conception rate, during the late summer and early fall months. Individual stalls help reduce social stresses encountered in group housing and ensure access to feed. This is especially important for first litter sows and pubertal gilts.

An additional boost in conception rate and litter size can be obtained by using more than one boaron each female (double mating). This maximizes the chance that a highly fertile and compatible boar will be used. It is easiest to accomplish when using hand mating or AI. When pen breeding, boars should be rotated from pen to pen at least once every day and rested periodically. Sex drive may be enhanced in boars by frequent rotation. However, rotation complicates evaluation of the individual boar for both conception rate and pig performance. Without sexual rest, sperm cells per ejaculate will be low in sexually aggressive boars. The labor requirement is lowest for pen breeding, but usable records are not generated. If the intent is to be present during farrowing, breeding dates are required. Also, less is known about the mating performance of the males or females; therefore, problems such as presence of blood in the semen, inability to couple properly and others are more likely to occur without being noticed. This makes it more difficult to keep accurate records of individual performance.

Managing the Gilt Pool

In any farrowing operation, the number of farrowing crates to be filled is fixed. The number of sows in those facilities fluctuates due to culling the infertile, unproductive or unsound sows. Genetic upgrading of the herd depends on using potentially more productive replacement gilts consistently to complete each farrowing group and ensure that a pregnant female will fill each crate by a preplanned schedule. The gilt pool, a group of young females selected as potential brood sows, is used to fill vacancies in the sow herd. Empty farrowing crates indicate a lack of planning and poor use of the gilt pool.

Management of Developing Gilts. To produce a maternal line, mate the more prolific sows to boars that produce gilts with greater genetic potential for maternal traits. Growth rate and carcass composition are not as important in boars chosen to sire more prolific daughters (gilt line). Boars of white breeds are superior 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, one type for each purpose.

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. Research results show that rearing environment has a large effect on the reproductive capacity of gilts. 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. 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 fewer 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 also can 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. Stressing gilts by withholding feed and/or water or abusing them in other ways is not a good method for inducing estrus. Remember that gilts should weigh 230 lb to 240 lb at first mating.

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 using Table 2 and examining previous records for the same season. Under normal conditions, about 15% to 30% of the weaned sows from each farrowing are culled when minimum turnover is practiced. When determining the number of replacement gilts needed, selection of as many as three replacement gilts for each farrowing crate to be filled may be necessary. 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 chance of obtaining more than enough pregnant females for a predetermined schedule. It is vital to use hand mating or AI in the gilt pool to maximize the chance that only the best gilts are used, i.e., become pregnant with the least number of matings.

Time Females Spend in the Gilt Pool. It is worth emphasizing again that no gilt should be saved if she does not conceive by the third mating. Keeping gilts in the gilt pool that fail to cycle is not recommended for several reasons. Any gilt that does not cycle after being placed in the gilt pool is less productive than those which do. 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 and cull gilts may reach excessive marketing weights.

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 with a boar and all cycling gilts either can be mated and moved to gestation facilities or 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 second set of 3 pens, and they will 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 and 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. 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 due to 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.

Pregnancy Detection. Electronic pregnancy diagnosis is a reality. With ultrasonic detectors, a producer will know with 90% to 95% accuracy how many females have settled early in gestation. These machines are most accurate and give the best return per dollar invested when they are used between 30 and 45 days after breeding. The economic advantage and accuracy drops off rapidly after 45 days. The Doppler instruments which can detect fetal heartbeats may be used over a longer period of time, but cost more. Some instruments can do double duty by measuring backfat and loin eye depth as well.

If bred females are observed for return to estrus at 18 to 25 days following mating, electronic pregnancy detectors are not necessarily needed. Most producers do not remove open females from gestation pens before 90 days. Assuming feed costs amount to $0.35 to $0.50/day for open or pregnant females, and that an average of 10% of all females bred will not conceive, it costs about $30 to maintain an open female between days 30 to 90 postbreeding. Therefore, another pregnant sow must produce 3 extra pigs just to pay for each open female's feed cost. On this basis, a producer farrowing 300 litters per year can pay for a $1200 pregnancy testing machine within two years.

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 all-in, all-out management practice can be achieved with wise use of the gilt pool and group weaning.

Farrowing Management

Being present when sows farrow will save up to 1 or more pigs per litter, but do not give any assistance unless necessary. Keep sows as comfortable as possible. The average interval between births is approximately 15 to 20 minutes unless a problem develops. Producers with more experience in handling farrowing problems may assist the sow in trouble (straining without results for more than 25 to 30 minutes between births). Close observation is recommended since immediate assistance is necessary to resolve most farrowing problems such as pigs tangled in afterbirth and bleeding navel cords. If experienced help is unavailable, consult a veterinarian as soon as possible. Keep the pen clean, remove all afterbirth and supply supplemental heat for the baby pigs. Make sure sows have and consume plenty of fresh, cool water. Check them closely and be sure they remain in good health and properly care for their pigs.

Try to insure that constipation is not a problem, as milk production will be depressed. Brief periods of exercise may alleviate constipation, increase feed consumption and stimulate milk flow. Constipation problems also can be minimized by feeding a bulky ration for several days prior to the expected day of farrowing. Remove all feed the day of farrowing. If breeding dates are available, you may consider inducing farrowing with Lutalyse or other prostaglandin to shorten the time required for farrowing observation and to facilitate cross-fostering of large litters with small litters.

Nutrition

It is important that brood sows and gilts get the proper levels of nutrients for successful reproduction. Feeding in excess is not only wasteful and costly but may increase embryonic mortality. A limited-feeding system using balanced, fortified diets is recommended. Individual feeding insures that each sow gets her daily requirement of nutrients without consuming excess energy.

As a rule of thumb, 4 1b of a balanced diet per day usually will provide adequate protein and energy. During cold weather, additional feed may be required, depending on the type of housing. Heavy milking breeds or females that are still growing will require more total nutrients. With limit-feeding, it is extremely important that each sow gets her level of feed and no more. One of the following systems may be used to restrict energy intake of gestating females: daily individual limit feeding or interval feeding.

The daily feeding of a limited amount to each individual is the most popular system, and its success is based on having an adequate number of feeding stalls or space for individual animals. Group feeding on a daily basis is less desirable. The individual stall is best because it prevents the "boss sows" from taking feed from slower-eating or timid sows. However, individual feeding takes more labor if it is not mechanized. Self-feeding for given intervals (1 day every third day) takes less labor but is the least acceptable method for two reasons: (1) it costs more to maintain sows, and (2) it is very difficult to control feed intake.

All animals are territorial and therefore like to have some space identifiable as their own. Use of individual stalls or maintaining small groups, especially during early gestation (through day 30), provides for this need. Some breeds (Yorkshire and Landrace) appear to adapt better to stalls than others while the Hampshire breed is one considered best adapted to pen or even outside lots. If gestating females are group housed, keep them in as small a group as possible (15 to 20 maximum) and separate gilts and first-litter sows from older and fat sows. Comfort and contentment of bred females is important to achieve maximum productivity from the breeding herd.

Herd Health

Abortions, mummified fetuses, stillbirths and irregular estrous cycles are indicative of potential disease problems. These disease symptoms can be inconsistent. There are a number of viruses that may be responsible for the occurrence of mummies. Brucellosis continues to cause losses as does leptospirosis, even though effective vaccines are available for the latter. Porcine Reproductive and Respiratory Syndrome (PRRS) may result in significant reproductive losses when first infecting the herd. Irregular cycle lengths should raise suspi-

cions regarding infections and professional consultation should be obtained. There are no treatments for any of the viral diseases. If there is any question about the health status of the breeding herd, consult with a swine veterinary practitioner and review your herd health program. It is a good idea to have regular consultations with key specialists, i.e., animal health, reproductive management, nutrition and facilities.

Introducing New Breeding Stock. Many producers bringing new breeding stock into their operation increase herd health problems when the new animals are not properly quarantined. All new breeding stock should be isolated from the main herd for a minimun of 30 days. After the first 15 days of isolation, the new animals should be blood tested for certain diseases (see PIH-59). After receiving negative test results, vaccinate and expose the new animals to several market hogs during the succeeding 30 days. This will give the newly purchased animals a chance to develop immunity to any new disease challenges already present in the herd. At the same time, check the market hogs for disease reactions. The development of fever in the market hogs may indicate that a disease organism is present to which the herd has no immunity. In addition, you may want to test mate new boars to cull females during the isolation period. The test barrows or cull females may be sold directly from the quarantine pen. Commercial producers may reduce disease risk by purchasing only herd sires, or introduce new bloodlines by using AI. Females, if purchased, should come from a single source at any given time to minimize potential health problems. Introduce the new animals into your herd only after negative blood testing results are received. The key factors are to plan far enough in advance that you are able to find the quality and quantity of replacements from a single source early enough that an adequate quarantine can be used.

Records

Records are essential in modern pork production. To keep accurate and meaningful records, sow identification is necessary. Ear notching (See PIH-114) and/or ear tagging should be done for quick and simple identification. White gilts can be tatooed when they enter the breeding herd for an identification check. Records should be kept on each sow and each litter she produces. Computer systems such as Pig Champs have become user-friendly and provide as much information as the producer desires. The computer programs provide sow productivity values and herd sire evaluations in addition to keeping track of genetic lines. Less complex records may be kept by hand, but make sure that the data collected becomes useful information and not just waste paper.

Additional records are desirable in many circumstances to utilize boar power more efficiently and identify breeding problems early. Keep records of boar services and, if AI is used, the date and volume of each ejaculate collected. A record of the date and duration of heat is essential for predicting when females will next be in heat, calculating dates for return if conception does not occur, pregnancy checking dates, and the day to bring them into the farrowing house. Computer programs are available for use in keeping, organizing and analyzing all of these records.

Summary

Commercial gilts should be selected from the largest, healthiest litters (based on farrowing and weaning data) as replacements on the basis of their ability to come into heat at an early age and conceive within 3 heat periods after their first exposure to a boar. Sows should be retained on the basis of their ability to conceive within 7 days after weaning, or the earliest time that fits your management schedule and their ability to wean a large, healthy litter. Use of the sow productivity index as developed by the National Swine Improvement Federation is recommended as an added selection tool. Regardless of how sperm are placed in the female's reproductive tract, they must be there a few hours before ovulation to maximize the chance of getting the best pregnancy rate and litter size.

During gestation, gilts should be fed so they will gain about 100 lb and sows should gain about 50 lb. Depending on facilities, lactation may last 10 to 28 days to help ensure that baby pigs get a good start. At farrowing, additional pigs will be saved if an attendant can be present to correct problems when they occur. Adequate records of individual performance during all phases of the reproductive cycle will be of benefit in upgrading the herd and making it more profitable.

Related Publications

The following PIH fact sheets contain additional information related to swine production.

PIH-1	Management of the Boar
PIH-27	Guidelines for Choosing Replacement Females
PIH-59	Infectious Swine Reproductive Diseases
PIH-64	Artificial Insemination in Swine
PIH-68	Guidelines for the Development of a Swine Herd Health Calendar
PIH-74	Management of Developing Gilts and Boars for Efficient Reproduction
PIH-87	Cooling Swine

This Fact Sheet is the result of combining PIH-8 and PIH-89 and the authors wish to acknowledge the work of the authors of the latter which was incorporated in this Fact Sheet.

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