

Dr. Jodi Sterle
Assistant Professor and State Extension Swine Specialist
Texas A&M University

At the 2000 San Antonio Livestock Exposition, almost 1200 gilts, an increase of over 300 from last year, were shown in the Junior Breeding Gilt Show. Many shows are seeing similar increases in their breeding animal numbers. This trend poses the question: Where do these females end up at the end of the show? Unlike the barrow shows, the breeding shows are not terminal, and are set up with the youth producing their own animals in mind. While this adds a whole new dimension to the swine project, one that is more educational, truer-to-life and can be very rewarding than just feeding pigs, there are some things to consider before you keep that gilt back as a replacement to breed.

Unfortunately, reproductive traits and carcass and growth traits do not work together. Actually, they work in opposition of each other. Gilts and sows in commercial production have, and actually need, more fat than we would see on any show pig. Not only are some reproductive hormones synthesized from cholesterol, but it appears that fat is one of the signals to the brain that the female is in good enough body condition to support a pregnancy. If there are not enough fat reserves to support a pregnancy to term, the female will not cycle, thus preventing any chance of getting pregnant. This is one reason that thin sows, or other farm animal species, that get drawn down after lactation fail to breed back. This concept becomes important to consider when we think about how little fat a show gilt is usually carrying. Most gilts that I have seen in the showing can stand to be taken home and fed a conventional (14% CP) diet for a few weeks to lay down some condition.

Structural soundness, underline (udder) soundness and reproductive traits such as number born alive, number weaned and 21-day litter weight become very important in a sow herd. In general, reproductive traits are lowly heritable (unlike carcass traits), meaning that environmental effects play more of a role than genetic effects, making these traits slower to respond to selection than highly heritable traits such as backfat thickness and loin eye area. This does not mean that these traits should not be a part of your selection program, however. Additionally, reproductive traits respond well to heterosis, or hybrid vigor, that we can achieve through crossbreeding. Heterosis is that little extra "boost" that we see in crossbred animals in traits such as survivability, vigor, reproductive traits and others. The offspring actually perform better in these areas than we would expect by taking the average of the two parents due to being crossbred.

Many things determine when a gilt reaches puberty, or begins cycling. Age is the primary factor, but body condition, plane of nutrition, exposure to a mature boar, pen size and the number of gilts per pen all play a role. Most gilts will begin to cycle about 180 to 210 days of age. In general, it is the extremes that cause reproductive problems. Extremely poor nutrition or obesity may both delay puberty. While most show gilts are well-taken care of and are seldom obese, holding a gilt at a certain weight for an extended period of time may have long-term negative effects on reproduction. Direct contact with a mature (at least eleven months of age) boar for 15 minutes a day can decrease the age at puberty by about two weeks. Social interactions between gilts also appear to affect the onset of puberty. Extremely large (greater than 150) or small (less than three) groups reached puberty at an older age than gilts in moderately-sized groups.

Once a gilt begins to cycle, the next step is getting her bred. Knowing your animals and what is considered normal behavior will help in detecting estrus, or standing heat, but nothing helps as much as a mature boar. Since we are trying to time insemination with ovulation (or when the eggs are released from the ovary into the oviduct where they are fertilized), detection of estrus becomes extremely important. Signs of estrus include a swollen, red vulva (external genitalia), mucus from the vulva, standing to be mounted (especially in the presence of a male), "popping" ears, increased vocalization, increased activity and mounting other females. Estrous detection should be performed in a neutral pen (neither the boar's home territory or the females' pen) and at the same time every day, at a time that is optimal for the females to stand. If a gilt or sow is too distracted (at feeding time, for example), agitated or uncomfortable (high temperature in the middle of the day), she may be in estrus but not stand. Early in the morning works best, especially since it can still be quite warm in the evening during the summer. If you are going to perform estrous detection twice per day (to hopefully more accurately determine the onset of estrus), the both checks must be done properly and as close to 12 hours apart as possible. The standing heat response is coordinated to occur right before ovulation so that the gilt will stand to be mounted, inseminated and the semen able to make its way to the oviduct before ovulation occurs. During natural mating, the boar inseminates the female multiple times during standing heat, not to increase the number of volume of sperm cells, but to ensure that the sperm cells are in the oviduct at the time of ovulation. Unfortunately, the only external sign that we have that ovulation is about to occur is standing heat, so detection of estrus is vital. It is critical to mate the female within a few hours before ovulation. However, timing of ovulation varies. Gilts will generally ovulate sooner after the onset of estrus than sows. There is also variation among farms, genetic lines and individual females. Because sows stand longer than gilts and because ovulation in both sows and gilts occurs towards the end of estrus, it is recommended that with twice-daily heat checks (performed 12 hours apart), gilts be inseminated 12 hours after the detection of estrus and sows be inseminated 24 hours after detection of estrus. With once daily heat checks, the accuracy of estimating the onset of estrus decreases; therefore gilts and sows are usually bred when they are found in standing heat. As patterns of expression and duration of estrus are established for a given farm it may be possible to refine the time and number of inseminations. Additionally, it is recommended that all females be mated at least once daily for each day that they stand. While this potentially results in some waste of semen, it is the best way to ensure that at least one mating is optimally timed relative to ovulation. It is important to initiate the standing reflex while inseminating in order to illicit uterine contractions that are essential for transport of semen through the uterus and into the oviduct for insemination. Without the standing reflex, the contractions do not occur, and semen can backflow out of the female's reproductive tract, even some time after insemination is complete.

Keeping that good gilt back to breed for next year's project will bring a whole new set of experiences to the swine project. It can be a very rewarding experience to show an animal that you raised yourself. Being aware of the possible pitfalls and understanding the physiology behind reproduction will help make your project a success.