



FACT SHEET

Timing of Inseminations for Optimal Performance in a Swine Herd

Nadine Funk, Non-Ruminants

Selecting a breeding program or protocol that will achieve the best results for a farm can be a challenge. Several tools are available for the producer to help determine what program will achieve the greatest success on their farm.

Traditionally, it was believed that sows ovulated at about 38 – 40 hours after the onset of estrus. Over the last decade or so, research using ultrasound equipment has shown that the timing of ovulation is variable and generally occurs about two-thirds of the way through estrus.

While this information is valuable, it is of little use in a practical sense, without some guidelines to estimate the duration of the estrus period. Estrus can last from 24 to 96 hours. The duration of estrus can be affected by genetics, season, stress, and boar stimulation. A major influence on the duration of estrus is the wean-to-estrus interval (WEI). This is the number of days from weaning to first signs of estrus. In general terms, the longer the WEI the shorter the duration of estrus. Sows of third or greater parity tend to come into heat sooner and remain in standing heat for longer (3-4 days), while younger sows tend to come into heat a bit later and exhibit a shorter standing heat (1-3 days). Gilts generally have a shorter standing heat of <2 days.

Sharpen Heat Detection Skills

The key to timing inseminations lies in the ability of the barn staff to detect sows in heat. Good heat detection is a skill that requires close observation, patience and practice. Checking for heat twice daily is ideal; though, if time is a concern, one thorough heat check per day is better than two rushed heat checks. The following lists some key points that help to make heat checking effective and efficient.

- Check ½ hour after feeding and again as close to the end of the day as possible
- Use a boar
 - boar should be “chatty” and “smelly”
 - these are the ones that create the best response in the sows
- Direct contact is best, but if testing in a crate situation be sure to allow for nose to nose contact
- Stock people should follow the boar about 3-4 sows behind the boar to allow sows to exhibit response (it may be necessary to limit the boars progress so that the technicians can keep up, ie block off alley)
- Use the back pressure test (BPT) in the presence of the boar to determine a standing reflex.
- After boar exposure, sows may exhibit a “refractory period”, where they are non-responsive to BPT or boar stimulation. These animals need to be left for 30 minutes or more before they will exhibit their next strong standing response.

Signs of Pre-heat (don't breed yet)	Signs of Standing Heat (ideal time to breed)
Restlessness - bar biting Male characteristics (mounting) Reduced appetite Watery discharge Increased vocalizations - honking, grunting Red, swollen vulva	Pricked ears Stand to BPT Reduced appetite Arched back and trembling Glazed eyes Mucus discharge (sticky) Tail upright and flicking Reddish vulva (not as red as preheat)

Timing of Insemination

Ultimately, viable sperm that are capable of fertilization and quality ova need to be in the oviduct at the same time. Following insemination, the sperm take about 15 to 30 minutes to travel to the oviduct, where they must sit for 6-8 hours in order to capacitate (become capable of fertilizing the eggs). The sperm are thought to remain viable in the uterus for at least 24 hours. Ovulation generally takes between 1 to 3 hours to be completed and the eggs are thought to remain viable for about 6 to 8 hours. Thus the importance of well-timed inseminations is paramount to having success in the breeding barn.

Based on the above information, insemination should ideally occur at about 12 to 18 hours prior to ovulation. In fact, research has shown that insemination between 0 and 24 hours prior to ovulation results in high fertilization rates, good litter size and low numbers of repeat breeders. Mating after ovulation has been shown to be ineffective. Figure 1 shows the timing of events relative to the onset of estrus.

Awareness of the wean to estrus interval and it's influence on standing heat can help a producer establish an effective breeding program. By observing this relationship on an individual farm basis for about a month, producers will be able to improve the efficacy of their breeding program. At the very least, being conscious of the fact that later standing sows will be in heat for a shorter period and thus should be bred sooner should serve as a useful guideline. Table 1 provides a basic example of how a breeding program might change relative to the WEI.

Table 1: Example of Variation in Breeding Program in Relation to the WEI

<i>Timing of Return to Estrus</i>	<i>Standing Heat (days from weaning)</i>	<i>Optimal Time to Breed</i>
Early	Days 3-7	Day 5-6
Normal	Days 5-8	Day 6-7
Late	Days 6-8	Day 7

In a practical sense then, depending on how heat detection is done the following schedule should be effective in most barns.

Table 2: Basic Breeding Program

	Estrus Detection	
	Once Per Day	Twice Per Day
<i>First Insemination</i>	Immediately	12 h after first signs of estrus (< 12 h for gilts)
<i>Second Insemination</i>	18-24 hours after 1 st insemination	18-24 hours after 1 st insemination
<i>Third Insemination</i>	12-16 hours after 2 nd insemination	12-16 hours after 2 nd insemination

Whatever breeding program is employed on a farm, good heat detection is the first step to having success in the breeding barn. Spending time doing effective heat checks will pay dividends in the end and contribute to the success of any pig operation.

For more information contact:

*Nadine Funk
Non-Ruminants
(902) 678-7722
n.funk@agrapoint.ca*

*The Resource Contact Centre
(902) 896-2345
info@agrapoint.ca*