

## Heat Detection

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### What is heat detection?

Heat detection is the process of identifying which females are receptive to mating. A sexually mature female pig in good health should cycle every 3 weeks if she is not pregnant or lactating. (The estrous cycle of swine lasts approximately 21 days.) On day 1 the female is receptive to mating; ovulation occurs on day 2 to 3.

### Standing heat

The display of standing heat ("estrus") is a physical expression of the female's release of oxytocin, increased levels of estrogen, state of ovulation and receptivity to mating. Oxytocin is a naturally occurring hormone which when released causes strong pulsing contractions of the uterus which aid in transport of the semen. The wavelike pulsations also cause strong rigidity of the muscles, a response commonly known as "standing heat." This standing response allows the female to withstand the boar's weight during breeding.

The expression and duration of estrus is affected by many factors, including age/parity, season/temperature, genetic composition, body condition, nutrition and previous exposure to a boar. The display of estrus typically lasts no more than 48 hours in gilts, and 38 to 64 hours in sows, although there is variation between farms and individual females. The "locked up" periods of standing heat last 5 to 15 minutes, depending on the level of stimulation received, the energy reserves of the female, and the time elapsed since the last standing heat and the subsequent refractory period. Ovulation will occur from 36 to 42 hours after the onset of estrus- sooner in gilts than sows.

### Signs of Heat

There are various conditions that the female can display which indicate the onset and/or presence of heat. Not all conditions are present in all females. Gilts may display characteristics differently than sows. Some characteristics may be more indicative of proestrus conditions, the period immediately before estrus: redness and swelling of the vulva, off-feed, rooting or mounting penmates, vocalization, etc. More prominent signs will be more present during estrus.

- Swollen, reddened vulva (proestrus)
- Vocalization/barking
- Mounting penmates
- Heightened activity level/restlessness
- Perked or twitching ears
- Sticky, viscous secretion of the vulva
- Rigid back and legs; "locked up"

### Simulating the Boar

Proper stimulation by the stockperson in preparation for artificial insemination should simulate the practices of the boar. While ideal boar exposure would involve physical contact where the boar is allowed to nudge, sniff and fully stimulate the female, consideration of time constraints and worker safety concerns has led to fenceline contact, which suffices. A good and manageable heat detection boar will provide touch by rooting, sound by barking and smell by emitting pheromones.

In the environment of heat detection in preparation for artificial insemination in stalls, the stockperson must emulate the actions of the boar while the boar provides fenceline nose-to-nose presence of sight, smell and sound.

### Steps to Identifying Heat

1. Manage active boar exposure to female by providing nose-to-nose contact. Ideally this involves full contact between the boar and female, however fenceline exposure will suffice
2. Stockperson should rub the female's side and apply slight back pressure. This action emulates the boar actions of nudging and rooting the female's side and flank to encourage a standing response
3. Stockperson should press fist below the vulva and "thumb check" the vulva for a sticky, viscous



secretion. This action emulates the boars nosing of the vulva as he detects the elevated temperature and secretions of the female in estrus.

4. Stockperson tugs or lifts the female's flank and rubs the underline. As oxytocin is released naturally, she will stand rigid or "lock up." This action emulates the boar shoving, rooting and lifting the female, with special emphasis in the flank area.
5. If the female exhibits signs of estrus and begins to stand rigid, the stockman can grasp the female's back and increase pressure or sit astride to confirm a standing response. The boar would naturally make attempts to mount and test the standing response. Once mounted, the weight of the boar is upon the female and his front feet will clutch the female's sides and he will thrust, further stimulating the female.

The female in heat and identifiable as a candidate for breeding is one that exhibits the typical signs of heat and will stand rigid from the presence of a boar or physical stimulation by the boar or stockperson. The more extensive the stimulation that can be provided, the stronger the presence of signs of heat will be as well as the completion of a successful mating.

## When to Heat Check

Ideally, estrus is detected twice daily in an attempt to accurately identify its onset. The estrus detection should be performed 8 to 12 hours apart. Females should be segregated from boar contact for a minimum of one hour prior to estrus detection.

There are certain days in the female's reproductive stage which should be a focus for heat detection. In the gilt, these dates would be 21-24 days post-movement or mixing and the subsequent 21 days periods, plus or minus 3 days. For weaned sows, estrus would normally be detected 4 to 8 days post-weaning as well as 21 and 42 days post mating, (+/- 3 days). Open sows or those with no previous documentation of heat or recent weaning should be checked daily.

The coolest hours of the day are ideal for heat detection. Sows and boars are more active and exhibit longer heat responses during the morning hours. Females must also be in a good state of well-being and physical condition.

## Successful Heat Detection

1. Get active. Physically simulate the actions of the boar and have the right attitude and proficiency to do a thorough job. Repeatedly examine the activity

in the natural mating process.

2. Be patient and observant throughout the day. Some females may not "lock up" until the boar has already passed by. Sows returning to estrus may be restless, off-feed and seeking attention.
3. Control boar exposure. Work to establish a heat detection routine in the barn. This involves sight, sound and smell. Timing is critical; too much unmonitored exposure is just as detrimental as too little exposure.
4. Keep accurate records. Record dates of gilt movement, mixing and exposure, hormonal treatment and withdrawal, signs of estrus, weaning or abortions. Note odd activities such as irritability, off-feed, vaginal discharges, etc.
5. Have the correct attitude and skill. The competent stockperson has the eyes to see, the mind to know how and the attitude to do. Positive caretaker-sow interactions increase reproductive success.
6. Reduce environmental and social stressors and provide adequate light. Estrus can be delayed or difficult to recognize in dim environments and noisy surroundings or when sows are mixed or handled aggressively.
7. Maintain optimum body condition. This should be accomplished through feed and health management. Consider ad-lib feeding after weaning to recover energy reserves.
8. Train the boar. To prevent sexual frustration and decreased libido, boars must periodically be allowed to breed. To maintain pheromone secretion (odor) and interest, boars should be rotated every 15-20 minutes during heat checks.



**For more information, please search for the following resources on PIG:**

*PIG Factsheets:*

- Fact Sheet 08-01-01, "Detection of Estrus or Heat"

## References:

- National Pork Board and Penton Media Inc. National Hog Farmer, Heat Detection NPB-04822 Poster
- Heat Detection Critical to Success. National Hog Farmer. October 15, 2007. Vol. 52, No. 10. Penton Media Inc. Overland Park, KS 66212