

AAA Business Bulletin

Artificial Insemination: heat detection & timing

A major bottleneck to successful Artificial Insemination (AI) is related to timing. A cow can only be inseminated if she is in heat, which means a dairy farmer needs to be able to detect accurately when a cow is in heat. Breeding cows that are not in heat result in failure, turning heat detection into a critical component of reproductive management. This Business Bulletin is based on the Genetics & Breeding training given to AAA. It explains and illustrates key signals of heat and other important factors regarding the timing of AI.

1. Estrous cycle of cows

The estrous cycle of cattle is the period from one estrus (the start of the moment of being in heat) to the next estrus. For cows and heifers, this period ranges between 18 to 24 days with an average of 21 days. The cycle starts on day 1 with ovulation, which is the rupture of the follicle in a cow's ovary, which releases the ovum (egg), after which the egg travels from the ovulation site to the fertilization site. The estrous cycle does not take place in cows that have not yet reached puberty, and it is also not present in cows that have recently given birth to a calf. The estrous cycle is run by hormones and influences behavior and fertility of the cow.

2. Symptoms of a cow in heat

Standing to be mounted

A cow standing to be mounted is the most accurate sign of estrus or the cow being in so called standing heat. A cow in standing heat stands still when she is mounted by another cow (or moves forward just slightly due to the weight of the mounting cow). In turn, a cow that is not in standing heat that is mounted by another cow will quickly move away. This is an easy to recognize sign and is the most accurate sign of estrous or the cow being in standing heat. Standing heat, which starts 18 hours after the cow enters into heat, is the best moment for AI.



A cow standing to be mounted is in standing heat.

Other signs of heat

There are several other common signs of a cow coming into heat. None of these are as accurate as the sign of the cow that stands to be mounted. They are however indicators for the farmer and it's important that the farmer learns to recognize these signs as well.



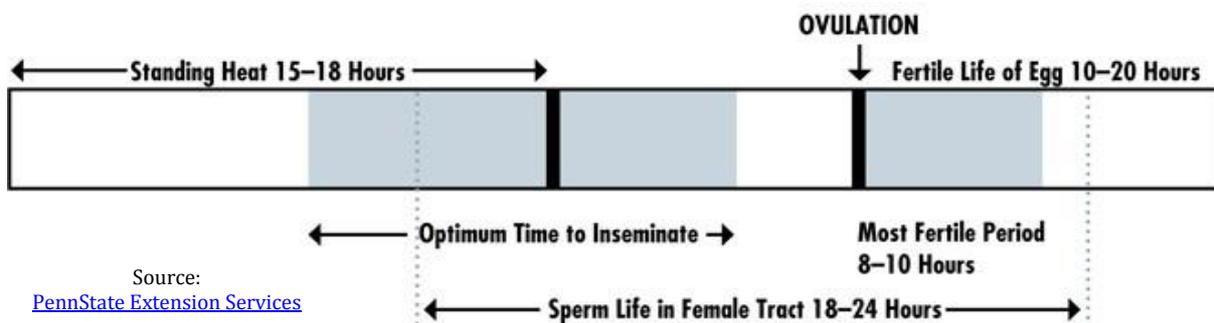
Mucus on flanks/legs and

They include:

- restlessness;
- the cow separating herself from the herd;
- attempts to mount others (this is a sign that a cow is coming into heat, it is different from standing to be mounted which only shows at the moment a cow is already in standing heat!);
- resting her head on the back of other cows;
- bellowing (howling).
- clear and copious mucus on flanks and tail;
- an enlarged and redder vulva;
- reduced feed intake;
- reduced milk production;
- a roughening of the tail head.

3. Considerations for the right timing for AI

The cow's egg travels quickly from the ovulation site to the fertilization site in the oviduct, so viable sperm should be at the site of fertilization awaiting the arrival of the freshly ovulated egg. Sperm has to be present in the female reproductive tract for around six hours before it is capable of fertilizing the egg. Ovulation occurs 25 to 32 hours after the onset of standing heat. This means that the best time for AI is 18 hours after standing heat.



Source:
[PennState Extension Services](#)

It's important to make sure that the cow is not already pregnant. Furthermore, if a cow has recently calved, at least 42 days (or more, depending on the breed) must have passed before she can be inseminated again.