



Vet Call

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Detection of estrus

Assuming that a high percentage of females are cycling at the start of the artificial insemination (AI) breeding season, the producer's or technician's ability to accurately identify heifers and cows that are in heat (also known as estrus) is usually the most important factor determining whether a high percentage of females will become pregnant by the AI mating. Estrus is the time period when the female exhibits sexual desire and acceptance of the male by standing to be mounted. This period lasts from six to 30 hours, with 20 hours being the average length.

Identifying females in heat

In the female reproductive tract sperm cells undergo a process, called capacitation, that is required for them to be able to penetrate and fertilize the female's egg. In order to achieve the highest fertility, sperm cells that have recently completed capacitation should come into contact with a recently ovulated egg.

In cattle, an egg is ovulated about 10-15 hours after the end of estrus; therefore, the goal is for insemination to occur a few hours

prior to ovulation, during the last few hours of estrus or during the first few hours following the end of heat. If sufficient fertile sperm are deposited in the uterine body at the proper time in the estrous (heat) cycle, fertilization will almost always occur (more than 85% of the time).

However, failure to identify animals that are in heat and that should be inseminated, or inseminating animals when they are not in heat, will drive down one's pregnancy percentage to unacceptable levels.

A study done at Cornell University in New York found that most estrous behavior occurs at night. The researchers reported that 22% of females exhibit signs of estrus between 6 a.m. and noon, 10% between noon and 6 p.m., 25% between 6 p.m. and midnight, and 43% between midnight and 6 a.m.

Based on this information, it is recommended that animals in the breeding group be observed for at least 30 to 60 minutes twice a day, early in the morning (prior to 6 a.m.) and late in the evening (after 6 p.m.). If females can be observed more times during the day, particularly at night, or for longer periods of time, more animals will be correctly identified in heat.

Estrous activity will be decreased if the weather is hot, during rain or snowstorms, and if footing is poor. Selecting a location for estrus detection that is least affected by inclement weather and has good footing is an important component of a successful AI breeding program.

If the females are being fed in a drylot, they should be slowly and quietly moved to one end of the pen for the observation period. Observers should move quietly in order to minimize drawing any attention to themselves. The observation period should not occur at the same time as feeding or other activities that will distract the animals.

If animals are in a pasture, they should be quietly moved to a nearby area that restricts their movement, such as a corner, during the observation period. Cattle in heat will tend to bunch into a group that is actively engaged in mounting each other. This group of cows is made up not only of females in heat, but also those that are approaching estrus and those that have recently stopped being sexually receptive. In some situations, it is helpful to remove the most sexually aggressive animals so that others that are not as aggressive have an opportunity to express heat.

See the signs

The best indication that an animal is in heat is if she will stand to be mounted by herdmates. This is called standing heat, or standing estrus, and is the best evidence an observer has that a female is near the time of ovulation and ready to be inseminated.



PHOTOS BY SHAUNA ROSE HERNEL

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► Secondary signs of heat include head-resting on animals that are in heat, mounting other animals but not standing to be mounted, clear mucous discharge from the vulva or smeared on the tail or rear, having hair rubbed off the tailhead, or having mud on the hips, sides, or even shoulders.

Females will have other characteristic signs or behaviors that are good indications of being in heat, called secondary signs of estrus; but these are not as good as actually observing standing estrus. A cow that mounts other cows without allowing others to mount her is displaying a secondary sign of heat that may indicate she is approaching estrus. Other secondary signs of heat include head-resting on animals that are in heat, clear mucous discharge from the vulva or smeared on the tail or rear, having hair rubbed off the tailhead due to riding activity, or having mud on the hips, sides, or even shoulders where front feet would be expected to leave marks from riding.

Estrus detection aids (Kamar® patches, tailhead chalk, chin-ball markers on gomer bulls or cows, etc.) have been developed to help identify animals that are in heat; but, they should not be considered a replacement for human observation. If a detection aid is tripped, but the animal has not been observed in standing heat, she is considered to have a secondary sign of estrus.

Observing a slightly bloody discharge from the vulva is not a sign of heat, but rather a sign that heat occurred two to four days ago. In most situations, females will be bred following both standing heat and one or more secondary signs of heat. However, if a high percentage of animals are bred following secondary signs of estrus only, the accuracy of heat detection is in doubt.

When to AI

If animals are observed for estrus continually throughout the day and night, the ideal time to breed is 16-24 hours after they are first detected in estrus. But because

in most situations females are observed twice per day, the most common advice is to breed 12 hours after first observing the female in estrus (a.m./p.m. rule). The a.m./p.m. rule is that those animals that are detected in heat during the morning observation period are bred that evening, and those animals that are detected during the evening observation period are bred the following morning. If cows are detected early in estrus and they have about a 15- to 25-hour estrus, they will be bred in late estrus by following this rule.

Because sperm have a fertile life span of about 24 hours, and eggs will remain fertile for about eight hours, producers do have some flexibility in timing insemination following detection of estrus. Some researchers have found that breeding once per day, where all the animals that are in heat during the morning observation period and all the animals that were in heat the previous evening are bred following the morning heat detection, results in pregnancy percentages that are equal to those achieved by following the a.m./p.m. rule.

Knowing how to accurately identify the behaviors and characteristics that indicate a cow or heifer is in heat and taking the time to quietly observe breeding animals at least twice daily are essential components for a successful AI breeding period. Improper timing of insemination because of inaccurate or incomplete heat detection will result in poor pregnancy percentages and is a common cause of dissatisfaction with AI.

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