

Tips for Heat Detection

Some pointers to help breeders get their cows while they're hot.

Story by Janet Mayer

According to annual statistics from the U.S. Department of Agriculture (USDA), almost 10% of all beef cattle females in the United States are bred by artificial insemination (AI). AI is a valuable management tool in managing calving difficulties among heifers, and it's also an economical, efficient tool to make rapid improvement in performance and genetics within a herd by the use of superior, progeny-tested sires.

However, AI also requires extra effort and planning, with the need for special attention to management, nutrition and the reproductive cycle, warns Terry Goehring, South Dakota State University (SDSU) Extension beef specialist. Because the bull is being replaced, it now becomes the job of the breeder to recognize the signs that a cow is in estrus, or in heat. Heat detection and proper timing of insemination are crucial elements to a successful AI program.

As simple as the task may sound, heat detection requires someone with the knowledge to recognize and interpret a cow's heat signals. That someone must have excellent observational skills, patience and the ability to keep accurate records. Experience with heat detection tools such as chin ball markers, mount detectors and heat synchronization products can be an asset.

With heat detection, observation has to be the most important part of the AI process. Goehring advises breeders to observe cattle at least 30-45 minutes twice a day, making this a routine part of the daily work schedule. Observations should not be scheduled at feeding time when the animals will be distracted.

Research at Cornell University shows that in any given herd, 22% of the cows can be expected to show heat signs between 6 a.m. and noon. The percentage drops to 10% between noon and 6 p.m. From 6 p.m. to midnight, it rises to 25%, with the other 43% showing signs of heat between midnight and 6 a.m. It is evident that observation should occur early in the morning and late in the evening to gain optimum results.

Tips for observation

A publication from the Pennsylvania Cooperative Extension Service offers producers the following tips for establishing a good heat detection system.

1. Pay close attention to environmental conditions. Rocky, uneven ground or muddy conditions can inhibit mounting activity in the herd. It is best to provide a slightly restricted area with good footing where cows can interact for periods of observation.

2. Set aside special pasture areas for heat observation, especially in larger operations. Cows should be moved into these areas two weeks before the start of breeding to allow the herd to establish a routine.

With about 5% of a normal cycling beef herd's females showing signs of heat on any given day, removing them from the areas as they are inseminated results in about half of the herd's being removed in approximately 10 days.

3. Pay close attention to the condition of the cattle. Condition will affect heat detection. Cattle with sore feet and legs will not stand to be mounted; nor will they exhibit normal signs of heat.

4. Proper nutrition also is critical to good reproductive performance. Inadequate or excessive protein levels and mineral and vitamin imbalances can cause poor heat expression and inferior conception rates. Make sure mature cows rest after calving, as body condition plays a large role in how fast the female will resume cycling. First-calf heifers will usually take longer than older cows, because the feed they consume must support their own growth plus milk production for their calves.

5. Proper handling facilities, such as a holding pen and chute, are essential to a good breeding program. If cattle are subjected to improper handling prior to breeding, a good conception rate cannot be expected.



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6. Identifying all the cows in the herd by use of ear tags, ear tattoos or branding is advised. If tag retention is a problem with a herd, a combination of ear tags and tattoos or brands should be considered.

7. Keep good records by recording when an animal is in heat, regardless of whether the animal is bred. Using a pocket notebook to record the heat period and other pertinent information on the cow may be helpful. This information can be transferred to a permanent record sheet for each cow. By using this method, future heat periods can be anticipated.

8. Appoint one person to be responsible for heat detection and train all personnel to recognize the signs of heat and to identify the animal

that is in heat. Promptly report this information to the responsible person.

9. Heat detection aids can be of great value in determining heat, but they should not be used as a substitute for visual detection. They are best used in conjunction with routine observation. Some of the more common aids include:

Chin-ball marker. This device is worn beneath the chin of a detector animal. It acts like a giant marker pen, leaving a mark on the cow's rump and back when she is mounted. This device is used on surgically altered bulls or androgenized cows (treated with male hormones).

Tail chalking or painting. This method is economical, but you must have the skill to interpret what you see. Chalk or paint is applied from the cow's hooks to her pins.

Animals riding the cow in standing heat will rub off the chalk; however, chalk or paint can also be smeared by licking and chin rubbing.

Heat mount detector. This is a plastic device glued to the tailhead of cows that are due to be bred during the next 21 days. The detector is white when first applied, but it will turn red from the full weight of an animal during mounting. A minimum of three seconds of full weight from a mounting animal is necessary to change the color. This device is not recommended if the herd is kept in heavy brush as it can be torn off or may show a false reading.

"Heat Watch." This is an electronic heat detection system developed in 1994 as an alternative to manual heat detection by DDx Inc. of Boulder, Colo. Cows are fitted with electronic transmitters, each inserted into a burlap pouch and glued to the cow's back — in front of the base of the tail between the hook and pins. When the cow is mounted, the pressure activates the transmitter, which sends a radio signal to a receiver that relays it to a computer where it is processed, recording the cow's identity, location, time and the duration of the mount. Heat detection is a process of checking the computer morning and night and determining the optimum time for insemination based on first standing heat and duration of heat.

10. If an operation does not have the time to devote long hours to heat detection, the use of heat synchronization should be considered. Using synchronization, a group of cycling females can be brought into standing heat and bred over a short period of time, enabling the beef producer to group-inseminate the herd. This results in a shorter, earlier calving season that also allows for heavier weaning weights.

Challenges

For beef breeders who are setting up an AI program or for breeders with a low conception rate in their herd, Michael O'Connor, Extension specialist for Penn State University College of Agriculture, advises that watching the herd for signs of heat is very important.

"Breeders have a very small window through which to observe an animal in heat; therefore, adequate time should be given to



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watching the herd, both morning and evening,” he says. “The average interval between mountings is seven minutes, with the mounting lasting an average of five to seven seconds.

“Avoid trying to do heat detection during feedings,” he says. “After they have eaten and are kind of loafing around is probably your best bet. In our Penn State herds, we find cows prefer to mount when other activities on the farm are not occurring. Another time to avoid is while you are doing chores. Evening hours seem to be the best, when the cattle are not distracted. I actually think they get bored in the evening, and that is when a lot of mountings occur.”

Another detection problem O’Connor notes is the lack of interest in a female in heat by herdmates that intensifies as the breeding season progresses. The best heat detectors are other cows just going into or coming out of heat. Cows in the middle of their estrous cycle, or pregnant cows, don’t usually show much interest in a cow in heat. By using heat synchronization, there is the advantage of all the cattle coming and going into heat over a short period of time.

A different solution was discovered during a study done with a Montana beef cattle herd. By introducing a gomer bull into the herd before actually wanting to breed, the herd was stimulated into heat a whole cycle sooner than other cows that were not exposed to the bull. However, O’Connor cautioned, this does not work with heifers.

“There are a lot of challenges in AI. To establish a good program with a good conception rate, I would have to cite proper nutrition of the herd, good restraint facilities, good footing and good heat detection as the most important. If using a herd bull for cleanup, do at least two services before turning the cows out with the bull. Understand that getting into an AI program is a commitment and, above all, you must have a system.”



Understanding what heat is

To do heat detection efficiently, it is important to first understand the estrous (reproductive) cycle. Knowledge of the process can be derived from publications available from most state universities or the Extension service.

The following information was compiled using information drawn from publications from Michigan State University, the University of Missouri, Colorado State University, Louisiana State University and the University of Nebraska,

Simply explained, heat is a regularly occurring, short period of time during the estrous cycle when open cows and heifers are, psychologically and physically, sexually receptive to the male.

This period of receptivity occurs about every 21 days, but it can vary among individual cows, with 17 to 24 days being common. Estrogen is produced when an egg develops inside a cow’s ovary a few days before standing heat (the time when a cow will stand firmly while being mounted). The release of the estrogen causes changes in the cow’s reproductive, nervous and circulatory systems, resulting in her showing signs of heat.

Cows that are about to come in heat or are already in heat usually group together. They will mount other cows, bawl and exhibit restlessness and friendliness to other animals in the

herd by licking and nuzzling. The vulva also can exhibit signs of swelling and reddening, accompanied by a clear, stringy mucus discharge. Roughened hair on the tailhead and mud on the side, shoulder or hips are signs of a cow’s being ridden by other herd members. A bloody mucus discharge may be observed between the second and fourth days. This is a clear indication to watch for the next heat period in 15-20 days.

Standing heat lasts about 12-18 hours and is the primary and most reliable sign of heat. It is detectable when a cow allows other animals to mount her while she remains standing. Ovulation is directly related to standing heat, occurring approximately 10-12 hours after standing heat.

Breeding should occur during the period between the middle of standing heat and six hours after it ends. Sperm cells remain viable in the female reproductive tract for 18-24 hours. The fertile life of the egg is approximately 10-12 hours, with the most fertile period in the first few hours

immediately after ovulation. For highest fertility, cows should be inseminated in the last two-thirds of heat or within a few hours after they are out of heat, which would be approximately 24 hours after the animal comes into standing heat.

After ovulation, the cow produces progesterone. Levels of progesterone in the blood remain high from Day 6 to Day 18 of the cycle (Day 0 being the day the cow was in heat), preparing the uterus for pregnancy. If pregnancy occurs, progesterone levels will remain high throughout gestation; if it does not, progesterone levels decline and the cow returns to the regular estrous cycle, initiating another heat.



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