

G952

(Revised February 2007)

## Estrus (Heat) Detection Guidelines

Jeffrey F. Keown, Extension Dairy Specialist  
Paul J. Kononoff, Extension Dairy Specialist

Ways to spot cows in heat are covered in this NebGuide.

Several factors are essential in maintaining a herd's reproductive health. Among the most important are: (1) maintaining accurate records, (2) knowing the visual signs of estrus (heat), (3) using proper heat detection aids, and (4) maintaining a herd health program.

By taking the four basic steps listed above, the expected calving interval for dairy animals will be close to the recommended 12 to 13 months. Beef producers need to strive for a 12-month calving interval to maintain a profitable enterprise.

This 12- to 13-month calving interval returns the most profit in product sold and provides the operation with an adequate supply of heifers to maintain herd size.

### Records Essential

If a producer is going to have an effective Artificial Insemination (A.I.) breeding program, accurate records must be maintained. Essential records to maintain reproductive performance are:

- Freshening dates
- Breeding dates
- Pregnancy check dates
- Due dates
- Dry dates

Many aids are available to help keep accurate records. All A.I. organizations offer heat charts and freshening charts free of charge.

Dairy Herd Improvement (DHI) testing also keeps track of all the essential dates for your herd. You can obtain Flexible Management Reports from DHI that can be formatted for any unique recording system. But remember, no matter what type system you use, be certain it is updated daily. You can have a very elaborate, costly recording system, but if not updated daily, the records are useless.

Each enterprise should have one person primarily responsible for maintaining the records. In most cases this is the person who also takes the lead in checking for heat at least three times per day. If everyone thinks someone else is responsible, all too often nothing gets recorded.

An excellent way to encourage accurate heat detection is to offer incentives to those given the primary responsibility. One useful incentive is to reward workers with \$5 for each pregnancy that results from a breeding performed after noticing a cow or heifer in heat. The improved pregnancy rates may be surprising.

Breed Holstein heifers so they freshen around 24 months of age. Holstein heifers produce the most milk if they weigh from 1,200 to 1,300 pounds immediately after freshening.

Research shows weight at freshening is more highly correlated with first lactation milk production than is age at freshening. It is essential to follow a sound heifer feeding and rearing program to meet the 24-month age and 1,200- to 1,300-pound weight standards.

Rebreeding should start at 45 days postpartum in herds with average heat detection and conception rates. Starting this early allows breeders to see that most cattle are successfully bred and pregnant to maintain a 12- to 13-month calving interval.

Herds with excellent heat detection programs and those that ensure that all cows receive their first service at the desired time by using aids such as the milk progesterone test and synchronization products can start rebreeding slightly later.

It costs approximately \$3/day to feed and house a dry cow. If the calving interval is 390 days instead of 365 days in a 100-cow herd, this added cost will approach \$7,500 per year.

### Visual Signs of Heat

**Standing heat:** This is the most reliable heat sign. The animal in heat allows others to mount her as she stands.

Secondary heat signs include:

1. Riding of other cows can be a sign of heat, but all riders are not necessarily in heat.
2. Roughened hair, or hair rubbed off, on the tailhead may be evidence of others riding, indicating this animal may be in heat.
3. Cows in heat may follow others, stand close and sniff, nuzzle and lick the back or rump of others.
4. Cows in heat or near onset of heat tend to group together.
5. Cows generally are more nervous than usual, and may bawl considerably, pace the fence and generally are more

restless. Keen observers, familiar with their animals, often can tell cows in or approaching heat by subtle changes in normal appearance. A drop in milk production sometimes is observed.

6. Another good indicator is stringy, clear (egg white appearance) mucus hanging from the vulvar opening or smeared on the tail or buttocks. Clear mucus discharges often can be seen in the gutter or on the ground where a cow had been resting.
7. The vulvar lips will look moist and slightly swollen. A somewhat smoother surface is shown rather than the normal dry, finely wrinkled vulvar lips of a non-estrous cow. Further, the hairs of a cow in heat tend to be wet and matted and smeared by tail and rubbing activity.
8. Bloody mucus, although not a consistent sign, can be observed between the second and fourth days following heat. This is not a sign of heat, but indicates the animal was in heat several days ago. Observe closely for the next heat cycle in about 15 to 20 days.

### Observation Is an Absolute Necessity

Regardless of where cattle are located (stanchion, barnyards, pasture or in a drylot), at least 30 minutes twice each day is necessary to properly detect standing heat. If possible, additional periods should be added to ensure proper heat detection.

The conscientious dairy or beef producer makes daily heat detection activity a high priority. It is important that the person detecting heat be solely occupied by this activity so as not to be distracted from this essential responsibility. It is very important to follow up on cows observed early in the day as “possibly in heat.”

Dairy or beef cows need to be provided with good “footing” to feel safe when they exhibit heat signs or are to be mounted. A dirt lot is desirable. Be sure the cattle have properly trimmed feet. A cow with sore feet will not stand to be mounted nor will she mount other cattle.

In summary, 30-minute observations—both as early in the morning and as late in the evening as practical—are essential and a minimum.

**Table I.**

Time	Cows showing heat signs
6 a.m.-noon	22%
Noon-6 p.m.	10%
6 p.m.-midnight	25%
Midnight-6 a.m.	43%

*Table I* shows the distribution of heat periods in a 24-hour period. The actual percentage of cows in heat during a 24-hour period can be influenced by the season of the year, with more cows showing heat at night during hot weather and more showing heat during the day during cold weather. Housing conditions also can have an effect on the distribution of heat

during a 24-hour period. The important point to remember is that heat can occur at any time.

### Tips and Aids to Detect Heat

Keen observation is of primary importance in detecting heat. Several aids also are available to help confirm and identify cows not exhibiting obvious signs of heat. All aids require careful management and proper interpretation to be successful.

The following aids (one through four) are based on normal mounting activity of other animals. Other factors that may assist conception are discussed in items five and six.

#### 1. Anticipate heat with records.

By recording accurate herd heat detection and insemination information on barn charts, individual cow record cards and heat expectancy charts, it is possible and practical to project when cows are most apt to come into heat. Cattle identification by tag number and sound record keeping make it possible to know which cow is bred to which bull, and whether or not she has been bred before. Newly developed tests can help confirm true heat and/or pregnancy.

#### 2. Chin ball markers are quite effective.

These are large ball-point markers mounted in a halter-like device placing the “chin ball” under the chin of a detector (marker or teaser) animal. When the detector animal mounts the cow in heat, the “chin ball” rubs on the back or rump, marking the cow. Detector animals can be either bulls surgically altered to prevent penis insertion or cows or steers that have been androgenized to increase sexual desire and mounting tendencies. Veterinary consultation is recommended to help make surgical and medical decisions in preparing these “marker animals.” Enhancement of disease prevention and other factors related to preparing a quality marker animal requires considerable technical knowledge.

#### 3. Heat mount detectors.

These are devices attached above and ahead of the cow’s tailhead. They are sensitive to pressure and are activated when one animal mounts another. These can be valuable tools in some operations but have limitations. Investigation of these devices is advised. Adaptation to some programs may not be suitable because herd management conditions occasionally may result in false readings, complete loss of the device and missed heat periods.

#### 4. Tail chalking techniques.

Many larger dairy operations use an economical tail chalking method as an aid in heat detection. A person working with the animal rubs chalk from the cow’s hooks to pins in thin bands during summer, and thicker ones in winter. Animals riding the cow that is in standing heat smear or rub off the chalk. Fresh chalk marks need to be applied each day, and extreme skill in interpreting the marks is necessary to determine if chalk was smeared by riding, licked off or lost for other reasons.

Remember, aids for detecting heat should never be substituted for visual observations. Aids by their very definition are to be used to help confirm a visual observation of heat or to indicate that extra effort should be spent on observing certain cows or heifers.

### Other Aids

1. **The Milk or Blood Progesterone Test** can be used in confirming a suspected heat when doubts about an individual cow arise. This test also can be used as an early indicator of pregnancy. This test must be used in conjunction with good records. The results of the milk progesterone test can be interpreted as follows:
  - A. Cows suspected of being in heat.
    1. High progesterone = not in heat.
    2. Low progesterone = could be in heat.
  - B. Cow potentially pregnant (milk sample collected 21-24 days after insemination).
    1. High progesterone = could be pregnant.
    2. Low progesterone = not pregnant.

Nearly a dozen of these types of tests are commercially available for dairy or beef producers and veterinarians for confirming very early pregnancies or stages of heat cycles. The test procedures vary for each commercial product, so be certain to read the instructions carefully and follow all directions.

2. **Synchronization of breeding** is being used in some situations to inseminate or breed at the most likely time for the cow to conceive. Synchronization can be used to breed a group of heifers at the same time so they will freshen in the same time period. This procedure should be used only by those producers who are certain they will have adequate help available during the freshening period to minimize deaths or other problems at calving.

Prostaglandin is one product used to control heat. Use of this product is quite effective, but again, expert advice from animal science specialists or veterinarians is necessary. Improper use can cause abortions in pregnant animals and, occasionally, if injected under unsanitary conditions, can cause serious problems in an adult animal.

All heat detection aids should be used strictly as a supplement to good visual observation and management. Frequently, cows are recorded as being in heat when they are not. Research indicates standing heat identification is incorrect only about 3 percent of the time, while various other methods are incorrect up to 20 percent of the time.

Remember, no heat detection aid can ever completely substitute for the keen, conscientious observer.

### Herd Health and A.I.

Diseases can be a major factor as a cause of reproductive failure. Problems can occur anytime, regardless of reproductive status. Signs of problems are variable because of multiple disease possibilities. Examples of these signs include erratic or missing heat periods, abortions, abnormal discharge and others.

Suggestions to minimize health problems are:

1. Manage to maintain nutrition and a dry, comfortable environment for the animal.
2. Maintain records to help identify cows, health and accident incidents, heat cycles and durations, date and type of vaccination, and any other pertinent health data.
3. Consult a veterinarian to obtain service and to prevent both general and reproductive disease. In addition to general prevention, the reproductive diseases to be considered are: Brucellosis, Vibriosis, Leptospirosis, Trichomoniasis, and occasionally, Johne's Disease and Tuberculosis.
4. Purchase semen or bulls from reputable sources so you do not buy a disease problem. Only purchase semen that has the Certified Semen Services (CSS) label on the straw. This label is given only to those organizations that have met the National Association of Animal Breeders (NAAB) standards for animal health, quality semen processing and packaging.
5. Maintain sanitary practices at all times.

Maintaining a sound reproductive program must be an integral part of any dairy or beef operation. Starting an A.I. program requires extra effort and input. The increase in profitability by using A.I. is worth the extra effort.

Additional dairy information can be found at [www.ne-braskadairy.unl.edu](http://www.ne-braskadairy.unl.edu).

### Acknowledgment

The authors would like to acknowledge Duane Rice, former Extension Veterinarian, who was a contributor of the previous edition of this publication.

UNL Extension publications are available online at <http://extension.unl.edu/publications>.

**Index: Dairy  
Breeding and Reproduction**  
1989, Revised February 2007

Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln cooperating with the Counties and the United States Department of Agriculture.

University of Nebraska–Lincoln Extension educational programs abide with the nondiscrimination policies of the University of Nebraska–Lincoln and the United States Department of Agriculture.