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Heat Detection

Cooperative Extension South Dakota State University

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Heat Detection

COOPERATIVE EXTENSION SERVICE
SOUTH DAKOTA STATE UNIVERSITY
U.S. DEPARTMENT OF AGRICULTURE

Heat Detection

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Extension dairyman

What is heat?

Standing heat (estrus) is the time when the cow stands to be mounted by other cows or a bull. The heat (estrous) cycle (number of days from one standing heat to the next) of the cow averages 21 days. Heat cycle length is usually consistent for an individual animal, but can vary from 17 to 24 days. The average cow will be in standing heat for about 14 hours. Some animals may stand for only 4 hours; others as long as 24 hours.

This fact sheet covers external signs of heat and heat detection aids, but it should be emphasized that **actually seeing the cow in standing heat** must be your goal.

Missed heats are costly

University of Minnesota veterinarians report that dairymen routinely catch only 57% of their open cows in heat. Ninety percent of the open cows not seen in heat are cycling, and are missed because of inadequate heat detection.

Missed heats increase days open and lengthen the calving interval. To have the optimum 12- to 13-month calving interval a cow must conceive 85 to 115 days after calving.

Each day a cow is open past 90 days in the average South Dakota herd costs $1.50, because of milk production losses, fewer calves born, increased veterinary expense, additional AI costs, etc.

A 14-month calving interval will cost you $85.50 per cow per year.

Take time to figure it out. A 14-month calving interval is 427 days, which is 147 days open (427 day calving interval – 280 days gestation[1]), and 57 days open over 90. The extra 57 days open at $1.50/cow/day totals $85.50 loss/cow/year. With a 50-cow herd the total loss would be $4,275.00 per year.

The losses from long calving intervals are "hidden" just like losses from mastitis, because it is money you don't see and never will see unless you change management practices. Heat detection is important because the percentage of cows detected in heat is a major factor influencing days open and calving interval.

When to watch for heat

A successful heat detection program requires watching cows at least two—preferably three—times each day, and devoting up to one-half hour per group per watch.

Australian researchers reported that 100% of cycling cows were detected in heat when watched 24 hours per day. One-hour observations at 7 am, 12 noon, and 4 pm resulted in detection of 91% of the cycling cows.

The best time for the first watch is before morning milking, because a high percentage of cows exhibit heat in the morning, as reported in a Canadian study (Table 1).

Table 1. Distribution of mountings by time of day.

Time	Percentage
12 midnight - 6 am	43
6 am - 12 noon	22
12 noon - 6 pm	10
6 pm - 12 midnight	25

Cows should be observed again over the noon hour, and the last watch should be conducted in the evening.

Dairymen milking in tie stalls and stanchion barns find it more difficult to detect heat during the winter months. They must rely more heavily on records to anticipate heat, and must be more aware of all external signs of heat.

Heat observation must be done when milking, feeding, and alley scraping chores are not being performed. Of course a good dairyman is always observant and will catch cows in heat at times other than the designated observation periods.

Know the signs and keep records

Heat detection must receive high priority. If possible, make heat detection the job of one particular family member or employee that believes heat detection is important. Younger family members can do an excellent job of catching cows in heat.

The following information on external signs, records, and heat detection aids will help you catch cows in standing heat and identify and catch some "problem" cows.

Fig. 1. Your goal is to **see** the actual mounting. Remember that if she stands while crowded by other cows she may not be in heat. It's a much better sign if she stands when she could move away.

[1] use 290 days gestation for Brown Swiss

Your goal must still be to actually see as many cows as possible in standing heat. A cow that is mounted once or stands when mounted in a crowded holding pen because she couldn't move may not be in standing heat (Fig. 1).

Awareness of the external signs of heat is important. They are listed below:

1) The cow in heat **stands** when mounted by other cows.
2) The cow in heat may mount other cows or try to get them to mount her, particularly when coming into or going out of heat.
3) The cow in heat may raise tail, roam and/or bawl, and hair may be roughened on the rump.
4) Mucus may be seen on the vulva and tail.
5) The vulva is swollen, large, moist, and smooth compared to when she is not in heat.
6) Her milk production and feed consumption may go down, and her behavior might change.
7) Blood may be discharged from the vulva 12 to 48 hours after the cow has gone out of heat. When you see a slight bloody discharge it only means that the cow was in heat, not that she is pregnant or open. Start watching for the next heat 18 days after blood is observed.

Records are an invaluable aid to heat detection. One of the most helpful record systems is the DHI 21-day reproduction calendar (Fig. 2) which is available from DHI supervisors. Each column is 21 days long. This makes it easy to anticipate which cows should be in heat. If all heat days are recorded you simply look to the square immediately left of the current date to see which cows were in heat 21 days ago. The squares above and below 21 days show which cows were in heat 19, 20, 22, or 23 days prior to the current day.

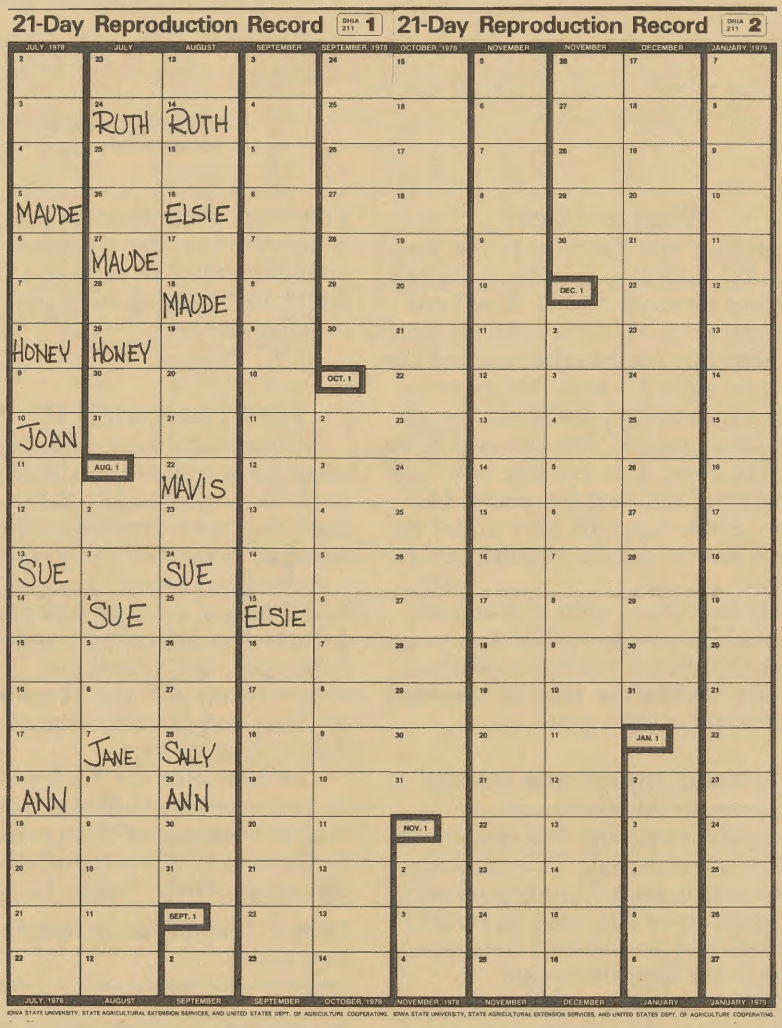

Fig. 2. The average cow completes a heat cycle in 21 days. The DHI calendar has 21-day columns. Look in the box immediately to the left of your present day. If Bossie's name is in that box, she's likely in heat today.

Other devices can help

Several heat detection aids are currently available. **These are only aids and must be used in conjunction with close observation and complete records.**

A **KaMaR Heat Mount Detector** is glued to the cow's rump. When the cow is mounted the detector turns from white to red (Fig. 3). When used in combination with close observation, KaMaR detectors are

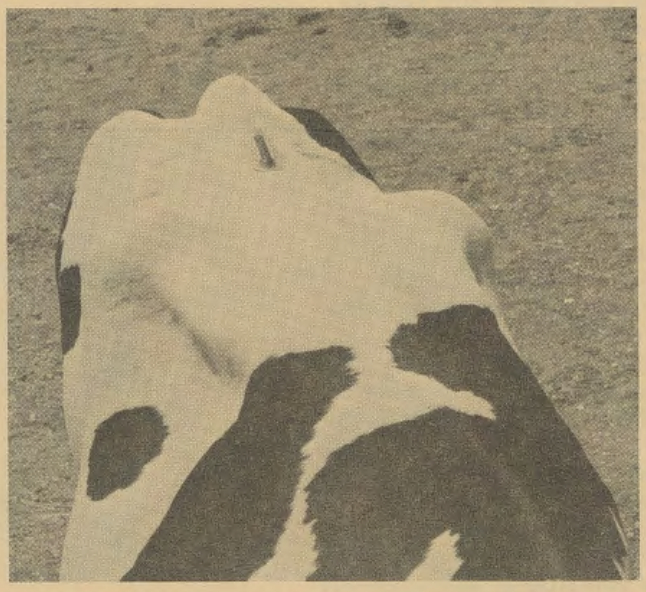

Fig. 3. An activated KaMaR heat mount detector is red. She has been mounted. This detector is especially good for cows whose heat periods are difficult to catch. Keep close observation.

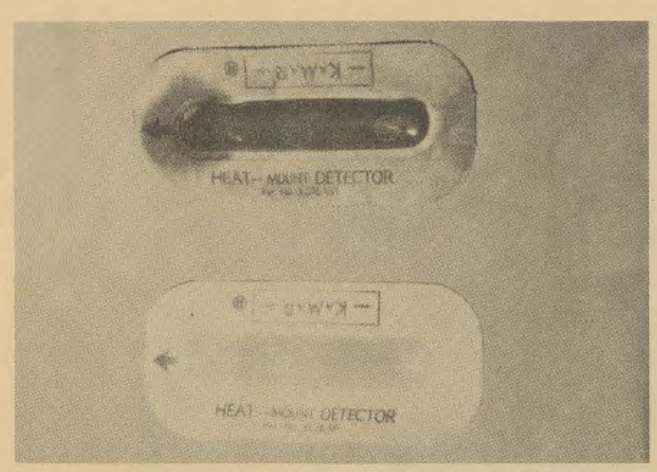

Fig. 4. The lower KaMaR has not been activated; the one on top is from a cow that has been mounted.

useful especially when placed on cows that are hard to catch in heat.

The **Delta Matemaster Heat Detector** is also glued to the cow's rump. The Matemaster contains a paint reservoir, and the paint is pushed out into 3 tubes when the cow is mounted (Fig. 5). The Matemaster includes a holder that can be left on the cow, requiring only the exchange of an activated detector for an unactivated detector. Accuracy of the Matemaster device is good if the cow is mounted enough to force the dye more than 1.6 inches (4 cm) into the tubes.

Marking the tail head with livestock marking crayon (Fig. 6) is an effective and inexpensive aid to heat detection. The back part of the rump and tail head are kept marked with a 2-inch wide crayon mark. A smeared or rubbed off mark indicates that the cow has been mounted.

California researchers have detected 43% of possible heats when the crayon mark is not used and 72% of the possible heats when the crayon mark is used. South Dakota State University workers detected heat in 60% of cows that were not crayon marked versus 73% in cows that were marked. Smeared marks were the only indication of heat in 2 of the 22 marked cows (9.1%). Heat would probably not have been detected in these two cows if they had not been marked; including them, 82% of the marked cows were detected in heat.

The **Chin Ball Marking Device** is an ink reservoir that is strapped onto the head of a specially prepared animal (Fig. 7). The animal in heat is marked with ink when mounted by

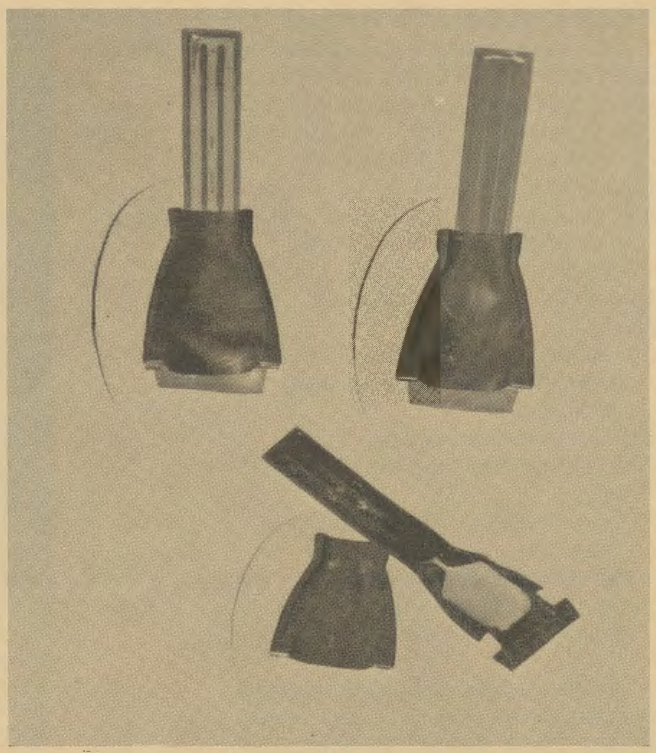

Fig. 5. The sheath of the Delta Matemaster is glued on the cow; the paint reservoir is replaceable (bottom). At upper right is an unactivated detector; the one on upper left shows, by its columns of paint, that the dye was pushed out of the reservoir when the cow was mounted.

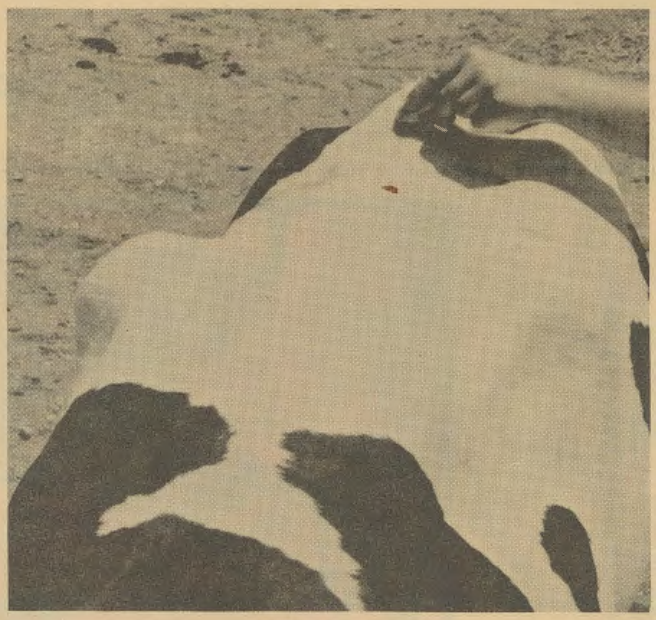

Fig 6. A blurred crayon mark on the tail head means the cow has been mounted. This method requires a livestock marking crayon and the same careful checking you'd do with any other method.

the animal wearing the device.

Each chin balled animal should be placed with 40-50 cows or heifers. Accuracy of heat detection depends on the herdsman's ability to identify the cows with new marks and to differentiate between cows marked while in heat and those marked because of crowded feed bunk conditions, etc. (false marks).

Specially prepared animals include

1) Gomer bulls that have been altered so they cannot mate with a cow;
2) Vasectomized bulls;
3) Testosterone injected steers; and
4) Gomer cows which have received a series of hormone treatments or exhibit nymphomania due to the presence of ovarian cysts.

A licensed veterinarian can assist you with these specially prepared animals. They should be equipped with chin ball marking devices.

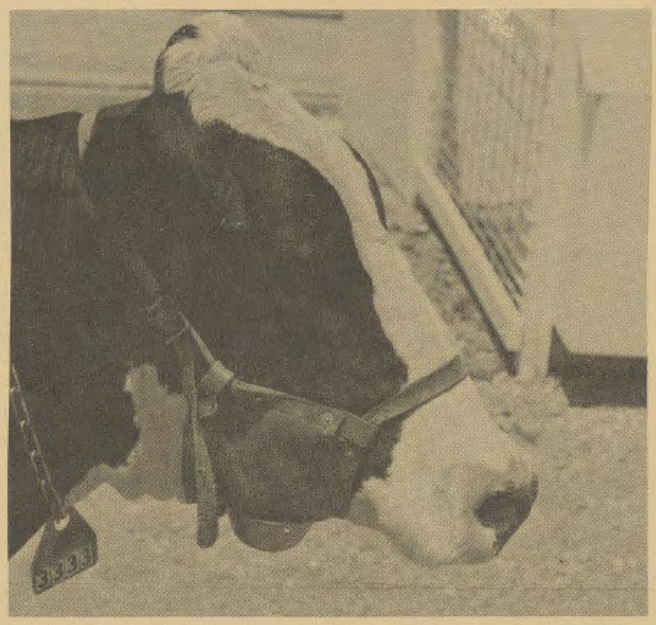

Fig. 7. The chin ball marking device transfers the burden of proof to the gomerized or otherwise specially prepared animal doing the mounting. Ink is rubbed on the cow in heat, but the catchy part comes in determining whether the mark is old or new, and whether or not it is accidental.

Several other aids to heat detection are being studied. Milk progesterone concentration, electrical conductivity of the cervical mucus, milk temperature, electronic heat mount detectors, and trained dogs might all become aids to heat detection in the future.

Estrous synchronization is the ultimate heat detection aid, because synchronized cows can be bred at a pre-determined time without observation for heat. New and effective synchronization products should be on the market in 1979.

Use of tradenames is for reader convenience, and does not imply endorsement of one product over another.

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