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## ERRORS IN HEAT DETECTION ARE COSTLY

J.S. Stevenson

### Summary

Attention to heat detection will decrease reproduction losses and costs associated with extended calving intervals and high culling rates. Errors in diagnosing heat (errors of commission) and missed heats (errors of omission) are the major errors of a heat detection program. Priority must be given to heat detection to improve reproductive efficiency and reduce the costs of reproductive failure on dairy farms.

### Introduction

Since the advent of artificial insemination in the 1930's, the biggest deterrent to a cost-effective reproductive program in dairy herds is proper heat detection. There are two aspects of heat detection that are important. The first is accurate diagnosis of estrus (accuracy), and the second is identifying all possible heat periods (efficiency). One may be quite accurate in diagnosing estrus, but still have a major heat detection problem because too many heats go undetected. The first type of problem could be classified as errors of commission and the second problem as errors of omission.

Reproductive losses in dairy herds cost producers over \$600 million annually. Most recent studies show that it costs dairy producers \$3 to 4 per day for every day a cow is not pregnant after 100 days in milk. For each cow that is sent to slaughter for reproductive failure, it costs another \$300-350, which is the difference between her salvage value and the cost of a good replacement heifer. Good heat detection is the key to reducing these losses by increasing pregnancy rates and decreasing calving intervals.

### Signs of Estrus

As cows are coming into heat, many will show various types of behavior that should alert us. Cows will: 1) stand and bellow, 2) smell other cows, 3) attempt to ride other cows, but not stand, 4) show evidence of a moist, reddened, and slightly swollen vulva, and 5) have clear mucous discharge from the vulva. These type of pre-estral behaviors may persist for several hours before standing estrus occurs.

The onset of heat is defined as the first time a cow stands firmly to be ridden by another cow. Typical behavior during estrus includes: 1) standing to be ridden, 2) frequent bellowing, 3) nervousness or excitable behavior, and 4) riding other cows. Remember that 60-70% of the cows that are mounting or riding cows frequently are in estrus. Watch them closely to determine when they stand.

When cows are no longer in estrus or going out of heat, they will: 1) not stand to be ridden, but may attempt to mount, 2) smell other cows, and 3) have clear mucous discharge from the vulva.

The best time to inseminate cows or heifers is during mid to late estrus. If cows are checked twice daily, then inseminate those cows in the p.m. that were observed in the a.m. of the same day. If cows were first detected in heat during the p.m., then inseminate them the next a.m. This constitutes the a.m.-p.m., p.m.-a.m. rule of breeding cows, and adherence to this rule should realize the highest conception or nonreturn rates.

#### **Errors of Commission**

A recent study demonstrated that some dairy producers are breeding a substantial number of cows that are not in heat. The study involved eight dairies and over 800 cows, which were checked shortly after breeding by means of a milk progesterone test kit. Those cows with high milk progesterone were not diagnosed accurately in estrus. If milk progesterone is high, that means that the cow has a functional corpus luteum and cannot be in heat. Conversely, remember that low milk progesterone does not necessarily mean that the cow is in heat. Milk progesterone is low for 7 to 8 days after the corpus luteum regresses, during estrus, and until the new corpus luteum forms and begins secreting progesterone on the fifth day after heat.

The breeding errors (mistakenly inseminating cows that have high milk progesterone) ranged from 2% in the best herd to 32% in the worst. In over 800 inseminations, 13.5% were given to cows with high milk progesterone. These types of errors occur when: 1) the identity of cows is misread or confused, 2) when cows are ridden when not truly in heat, and 3) heat detection aids are misused or misinterpreted (false positives). Care should be exercised when watching cows to be certain that the right cow is submitted for insemination. Do not rely solely on heat detection aids, because chalk marks and heat detection patches can be activated falsely.

#### **Errors of Omission**

It is generally believed that 50% of the heats go undetected on most dairy farms utilizing artificial insemination. Over 90% of the cows that are reported not to have been observed in heat are cycling normally but not seen in estrus. These errors of omission are the most costly part of heat detection programs. Someone should be assigned to be responsible for the heat checks and AI program. Cows and heifers eligible for breeding should be watched at least twice daily in addition to casual observations during the day when feeding, scraping lots, and moving cows to and from the milking parlor. Cows show estrus best after moving and mixing and will show about four times more mounting and standing behavior on dirt or pasture lots than when confined solely on concrete. Access to small dirt exercise or pasture lots can help increase the efficiency of heat detection. When more than one cow is in heat on the same day, the amount of mounting activity increases several times. The use of prostaglandins (Lutalyse® and Estrumate®) can help the heat detection program because it increases the number of cows and heifers that are in heat concurrently on the same day. Good heat detection is an important job on the dairy farm and should be given its proper priority to reduce the costs of reproductive failure.