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## UPDATE ON HEAT DETECTION AIDS

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### Background

Poor heat detection is a major cause of reproductive failure in most dairy herds. About one-half of the heat periods are undetected, resulting in prolonged calving intervals. In many cases, the problem is serious enough that some producers have compromised their breeding goals by utilizing natural mating exclusively or maintaining clean-up bulls. The result of these compromises means loss in genetic superiority of future replacement heifers and the potential for serious injury or death of farm help or family.

### Heat Detection Aids

Several methods utilizing heat detection aids have been promoted to improve the number of heat periods identified (efficiency) as well as to increase the accuracy of heat detection. These methods have included various detection aids (e.g., teaser animals, heat mount detectors, tail paint, and estrous synchronization). Increased costs are associated with obtaining such detection aids in addition to the cost of labor for visual observation and maintenance of the aids. Better training of people and more frequent observation for heat will increase heat detection rates. Aggressive teaser animals (vasectomized bulls or hormone-treated steers or cows) promote or instigate estrous behavior and increase detection rates compared with casual visual observation. However, hidden costs associated with maintenance of teaser animals are real, and there is an increased chance of injury in confined, concrete lots. Synchrony of estrus (e.g., by PGF<sub>2</sub>-alpha or its analogs) facilitates detection of more animals because of increased mounting behavior of many cows or heifers in heat simultaneously. Although supplementary use of heat detection aids might increase detection rate, there is no substitute for careful observation. Since most mounting activity occurs between 6 pm and 6 am, a minimum of two heat detection periods should be used. Success in AI programs is achieved when at least one person is responsible for heat detection.

### Economic Evaluation of Detection Aids

Using selected references, a recent Texas study evaluated various detection methods to determine the least costly ones. Summarized in Table 1 are expected detection rates based on type of method and frequency of observation.

Table 1. Heat detection aids and expected detection rates<sup>1</sup>

| Detection method     | Frequency of observation | Expected <sup>2</sup> heat detection rate (%) |
|----------------------|--------------------------|-----------------------------------------------|
| Teaser bull          | 3X/day                   | 85-100                                        |
|                      | 2X/day                   | 80-90                                         |
| Heat mount detectors | 3X/day                   | 80-90                                         |
| or tail paint        | 2X/day                   | 75-85                                         |
|                      | Casual                   | 55-65                                         |
| Prostaglandins       | 3X/day                   | 80-90                                         |
|                      | 2X/day                   | 75-85                                         |
| Prostaglandins +     | 3X/day                   | 80-90                                         |
| heat mount detectors | 2X/day                   | 75-85                                         |
| Visual observation   | 3X/day                   | 70-80                                         |
|                      | 2X/day                   | 65-75                                         |

<sup>1</sup>Adapted from Holmann et al. (1987) J. Dairy Sci. 70:186-194.

<sup>2</sup>The dairy producer's skill and attention to detail largely determine the heat detection rate attained with each method.

Because there are different time commitments and other costs associated with the various detection methods, the preferred method depends on the value of labor and the ability to achieve actual expected detection rates.

The study concluded that, if a producer believes the value of his labor is greater than \$2.25 per hour, heat mount detectors or tailhead painting would be the methods of choice. If, however, the value of labor is less than \$2.25, using unaided, visual observation 3X/day would be the most economical.

In order for heat mount detectors to be more cost effective than tailhead painting, they must increase detection rate by 10%. The above methods were 25 to 50% less costly than using a teaser bull or prostaglandins. The authors suggested that only dairy producers who are extremely poor at managing the alternative heat detection methods can justify the use of teaser bulls or prostaglandins as their routine heat detection method. One cost variable not examined in this study was the cost of the improved genetic gain that can result when groups of heifers are synchronized with prostaglandins for convenience of insemination by superior sires selected for calving ease. Costs of convenience are difficult to evaluate because they often correspond to quality of life.

Based on the results of the Texas study, break-even costs of labor suggest that tail paint or heat mount detectors with routine observation are more economical than unassisted visual observation under a wide range of dairy situations. The study concluded that a large proportion of producers continue to use unassisted visual detection methods because they place low value on labor for estrous detection.