

Estrus Detection Aids

Blessings or crutches?

Weaknesses in detecting estrus are the main limitation to optimizing reproductive efficiency. The following factors make estrus detection a major challenge and frustration for dairy producers:

- Intensity and length of estrus can be decreased under stress (nutrition, housing: comfort and footing, weather, high production);
- Physical evidence of estrus often occurs during the night;
- Frequently, in a small herd, only one cow or possibly none will be in heat on any given day.

Hormonal schemes to manipulate the timing of estrus and aids to enhance its detection have been developed in response to these challenges. Research has shown that detection efficiency can be improved when aids are used in conjunction with a good visual detection program.

Initially, the available detection aids were primarily used on problem animals. Utilization on a whole herd basis, as a substitute for visual detection, usually resulted in lower reproductive performance. Although these tools might have improved the ability to detect more heats, many were only qualitative and were not accurate when used to determine the timing of insemination. The result was lower conception rates. Also, as the ability to detect heat increased with the use of these aids, accuracy decreased due to an increase in the frequency of false positives.

With time continuing to be a limiting factor for most dairy producers, the demand is for estrus detection aids or systems that are accurate and can totally replace visual detection. With the advent of electronic methods and computerization, research and development efforts have focused on tools that possess the following characteristics while minimizing or eliminating visual detection time:

- facilitation of 24-hour estrus detection;
- increased efficiency and accuracy of detection compared to even very good visual detection;
- computerized to facilitate record keeping.

Many new tools offer the potential to improve conception rates by determining when estrus events occur. The trade-off for reducing labor is

larger capital investments for equipment and ongoing equipment repair and maintenance costs. A list of estrus detection tools (past, current, and future) with their advantages and associated challenges is shown in the table on page 2. The selection of a particular aid should be made only after carefully evaluating the farm's current estrus detection program and its associated costs (capital, labor, lost income potential due to poor performance). After this, each potential aid needs to be assessed based on its prospective benefits (increased reproduction success, decreased labor) and associated costs (usually capital).

All heat detection systems require a certain amount of labor. Although many of the new systems are being developed to minimize or eliminate visual heat detection and intensive labor requirement, time (labor) will be needed to understand, maintain and utilize the systems properly and efficiently. Minimizing investment in time to understand and operate any system efficiently will mean failure, no matter how accurate and efficient the system design.

There are many crucial management practices and tasks which must be in place for these aids to work:

- A sound nutrition and veterinary program are essential to assure animals are cycling properly and are in an energy balance conducive to maximizing estrus expression and conception;
- Proper identification of animals and excellent records are essential for recording and performing the appropriate tasks on the right animals;
- Conditions which maximize the expression of estrus and optimize estrus detection tools are critical. These include adequate time and space for animal interaction, and sound footing – environments conducive to mounting and estrus expression. In fact, they are essential for proper performance of estrus detection tools which are activated by mounting.

adapted and condensed from an article by:

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Aid	Advantages	Challenges
RECORDS <ul style="list-style-type: none"> • heat expectancy charts • breeding wheels • DHI records 	<ul style="list-style-type: none"> • Inexpensive • Easy to use • Easy to interpret • Minimal input time 	<ul style="list-style-type: none"> • Takes time
MOUNT DETECTORS <ul style="list-style-type: none"> • Patches (non-electronic) 	<ul style="list-style-type: none"> • Inexpensive • 24-hour observation • Infrequent need to replace if applied properly 	<ul style="list-style-type: none"> • False positives or activation • Detector loss if improperly applied • Qualitative: doesn't tell when mounting occurred • Requires mounting
<ul style="list-style-type: none"> • Chalks, Paints 	<ul style="list-style-type: none"> • Inexpensive • 24-hour observation 	<ul style="list-style-type: none"> • False positives • Qualitative: requires mounting • Labor: must be applied frequently at least every 2-4 days
<ul style="list-style-type: none"> • Pastes 	<ul style="list-style-type: none"> • Same as chalks or paints, but slightly more expensive 	<ul style="list-style-type: none"> • Fewer false positives and less labor compared to chalks or paints
<ul style="list-style-type: none"> • Electronic Devices (experimental product only) 	<ul style="list-style-type: none"> • 24-hour detection • Quantitative: defines number of mounts, time and duration of mounts • Minimal false positives • Decreased labor if applied properly • Easy to use computer software • Automatic cow ID • Measures physical activity also 	<ul style="list-style-type: none"> • Initial capital investment for electronic reader and devices • On-going investment in patches to house devices • Excellent records: to know how to move device to depreciate over maximum number of cows • Qualitative: requires mounting • Tail Head Implant.
ACTIVITY MONITORS <ul style="list-style-type: none"> • Electronic Pedometers 	<ul style="list-style-type: none"> • 24-hour detection • Some are quantitative (can pinpoint when activity was initiated) • Decreased labor if used properly • Component of automated ID systems in some units • Easy to use computer software 	<ul style="list-style-type: none"> • Initial capital investment • False positives: increased activity not always associated with estrus • Excellent records: to know how to move device to depreciate over maximum number of cows
ELECTRICAL CONDUCTIVITY <ul style="list-style-type: none"> • Vaginal Probes (european implant product only) 	<ul style="list-style-type: none"> • Quantitative: if measurements are taken at appropriate times • 24-hour automated detection • Computerized: easy to use software • Minimal labor 	<ul style="list-style-type: none"> • Initial capital investment • Variable costs: labor and sanitation • Labor intensive • Infection risks if not sanitary • Vaginal implant
HORMONES <ul style="list-style-type: none"> • Cowside Milk Progesterone Test 	<ul style="list-style-type: none"> • \$2-5 per test • Easy to use 	<ul style="list-style-type: none"> • Expensive if used on large scale • Qualitative: high or low • Labor intensive
DETECTOR ANIMALS	<ul style="list-style-type: none"> • 24-hour detection • Reduced heat detection labor 	<ul style="list-style-type: none"> • Animal must have good feet and legs • Costs: animal, housing, feeding • Investment in marking system • Poor results if hormone schemes are not followed • Danger of aggressive animals