One major key to improving dairy farm productivity is an efficient heat detection strategy. The benefits of early heat detection include increasing milk production over the lifetime of the individual cow, improving the conception rate, reducing the number of days open and increasing economic returns. This is especially important on farms where sexes are kept separate. If one heat is 'missed', the result is a calf being born at least one month later than it could have been if the farmer had been vigilant.

The oestrus cycle may be defined as a recurring period of time of varying lengths during which changes in the animal's body allow for conception to take place. The oestrus cycle is not erratic and in cattle it usually ranges between 19-21 days. However, the period of sexual receptivity (heat or oestrus) may only last between 6 to 30 hours.

**Oestrus (heat) detection in heifers**

Due to the shorter heat periods in heifers (when compared to the cow), heat detection is usually a bit more difficult. Compounded with this, is the possibility that signs of heat may not be easily observed in heifers as compared with cows. Thus it is recommended that farmers check for heat about 3 times per day in heifers. Any heifer found in heat should be recorded (date and ID#) as this will help in predicting future heat periods.

**General signs of heat**

Animals coming in heat show varying signs. Some of these signs are summarised below.

1. Cows/heifers may appear nervous and restless; some butt heads with other females or seek attention by laying their heads on the backs of other adult females in the herd.
2. Frequent urination and bellowing are common signs of heat.
3. Other secondary signs of heat may include a ruffled tail head, mud on the sides and back and red vulval lips that are slightly swollen from which a mucus discharge may be seen.

4. Cows in heat may circle each other.
5. A bloody mucus discharge from the vulva usually means that animal was in heat a few days previous and is not presently in heat. Note should still be taken of this animal and observe for heat signs in about 15-20 days.
6. Although these secondary signs may be useful in narrowing down those cows/heifers that may be in heat, it is believed that the only true sign of heat is what is termed 'standing heat' (Figure 1). This is where the female in heat stands to be mounted by another female that may or may not be in heat.

A cow identified to be in standing heat may be kept in the herd until she is ready to be served to help in identifying other cows that may be in heat. Cows that are in heat or near the onset of heat tend to congregate and it is also thought that the mounting action increases when more than one cow in the herd is in heat.

**Optimising heat detection**

Some general rules to optimise heat detection efficiency on farm are summarised below.

**Observation**

It should be routine that at some time during the day, preferably more than once; all cows should be free to mingle. During this time a trained person with whom the herd is familiar should observe for signs of heat for about 15-20 minutes. When looking for signs of heat do not feed or otherwise distract cows. Cows should be in an area providing the best 'footing'. If this is not provided animals may not mount other animals and may not even stand to be mounted.

Changes in body and milk temperature, milk production and feed intake usually occur when animals are in heat. However, these changes alone are not very effective in identifying animals that are in heat but could be used to further confirm animals that are suspected to be in oestrus through the other methods mentioned.
Record keeping
Records that are complete, accurate, neat and up to date will be extremely useful, especially in anticipating when cows should come in heat. Records should include the Female ID#, Bull ID#, date of observation of the first heat sign, date of last calving and date of service. Therefore it is imperative that all members of the herd be clearly marked.

Use of bulls and other heat detection aids
It is widely accepted that the bull is the best detector of heat. Farmers may use a bull that has been surgically altered to prevent actual penetration or breeding of the cow in heat. These bulls are normally equipped with a marker, usually at the base of the chin, which leaves a mark on any cow they may attempt to mount. These ‘chin ball markers’ may also be attached to other ‘detector’ cows. Conversely, the cow expected to be in heat may be equipped with a marker such as the Kamar® heat detector which becomes red when pressure, such as that exerted when a bull mounts her, is applied to it. A similar device is the Bovine Beacon®, which features chemiluminescent technology that ‘glows’ when the cow to which it is attached is mounted.

Electronic heat detection systems suited for the larger dairy herds are also now available. These may be expensive initially but may prove economical in the long term.

Pedometry
Pedometry has been extensively reviewed by Lehrer et al. 1992 and Senger, 1994.

Pedometers are used to measure the individual cow’s activity, which sometimes increases up to 3 times when the said animal is in heat. The pedometers are normally placed on one of the front legs somewhere between the dewclaw and the knee.

Heat synchronisation aids
Some farmers may use hormones e.g. Prostaglandins to synchronise oestrus, hence making heat detection and planning of breeding programmes easier. Farmers utilising these heat synchronisation aids should be fully aware of their use and treatment should be done wisely.

When should the animal be bred?
Research done by Foote (1979) seems to suggest that mid-morning insemination of cows observed in oestrus the previous night or on that morning, should give maximum conception rates. After the animal has been served it should be kept indoors overnight to increase fertility. It should be appreciated that it is not obligatory for the farmer to breed an animal just because it exhibits signs of heat. Other factors to consider when serving the animal include the size of the animal, diseases of the respiratory tract, length of time from the last calving, and the animal should also be fit enough for the breeding programme.

References


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