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PROVINCE OF KWAZULU-NATAL

DAIRYING IN KWAZULU-NATAL

Oestrus Detection

B J van der Merwe
Cedara Agricultural Development Institute

Poor oestrus (heat) detection can be considered the biggest and most common problem in reproductive management in the dairy herd. It leads to reduced fertility, which is clearly seen in an extended open period and in extended inter-calving periods. Where cows are bred by artificial insemination (A.I.), accurate heat detection is essential. Cows can then be separated from the herd, and inseminated at the appropriate time.

Oestrus is the physiological state during which a cow will stand to be mounted. The regular recurrence of mating behaviour (oestrus), together with changes in the reproductive hormones and genital organs, is referred to as the oestrous cycle. The oestrous cycle lasts from 18 to 24 days (average 21 days), and the cow should show signs of oestrus on average every 21 days. Oestrous activity (ovarian activity with the production of oestrogen) normally recommences during the first three weeks after calving. The first observed oestrus (heat) occurs 3 to 6 weeks after calving, although there is a considerable variation between cows and herds. It is essential, however, to give the cow a voluntary waiting period (VWP) of 45 to 60 days after calving before rebreeding. This period is necessary for involution of the uterus, which may continue for up to 6 weeks after calving (for further detail see KwaZulu-Natal Dairy leaflet 2.3 on Dairy herd structure/dairy herd dynamics).

Research indicates that, on average, 50% of all heats are missed. This is because the most reliable sign of oestrus, standing to be mounted, often goes unnoticed. A number of factors contribute to the difficulties in accurate oestrus detection:

- The oestrous cycle length varies between 18 and 24 days, the average being 21 days.
- The duration of oestrus may vary from 2 to 30 hours, the average being 15 hours.
- Research has shown that 70% of the mounting activity occurs at night, between 6 p.m. and 6 a.m.
- The average duration of a stand by a cow in heat lasts only 4 to 6 seconds.
- There is a wide range in the number of total stands per cow that occur during the heat period.
- The last two points therefore clearly indicate that the total time spent standing is very short relative to the entire period of standing heat.
- Research has also shown that mounting activity increases markedly when more than one cow is in heat.

OESTROUS BEHAVIOUR

Observation of the cow's behaviour is still the most commonly used method for the detection of oestrus. A cow coming into oestrus shows interest in other cows, and displays this interest in many ways, as depicted by the shaded cows in Figure 1.

As already mentioned, the best positive sign of oestrus is that the cow in oestrus will stand to be mounted and will not move away as depicted by the shaded cow in Figure 1 (ix). Other external signs include frequent urination, red swollen vulva with mucous discharge, and milk yield fluctuations on a daily basis. There is usually a 12 to 16% drop in milk yield on the day before oestrus. It is important to note that the abovementioned behavioural and external signs are noticeable to varying degrees as the cow comes into oestrus, goes through standing oestrus, and goes out of oestrus again. The times of these periods are 6 to 24 hours for coming into oestrus, 6 to 18 hours for standing oestrus (period during which cow will stand to be mounted), and 12 to 24 hours for going out of oestrus.

IMPROVING OESTRUS DETECTION

The following points will assist in improving oestrus detection:

- It is best that one person be made responsible for oestrus observation, and for recording the correct identity of those cows in oestrus. This person must realize the importance of the job, take the task seriously, and ensure that the necessary action is taken.
- Observe the relevant group of cows, or heifers, for heat for a period of 20 to 30 minutes, two to three times each day. These observations should not take place when other activities, such as feeding and milking, are in progress.
- Observations should be done early in the morning and late afternoon or early evening, keeping in mind that most of the mounting activity occurs between 6 p.m. and 6 a.m. Ensure that the cows are not on slippery, steep, rocky areas (or under a low roof) during observation : cows will hesitate to mount one another if they don't have a good footing.
- Oestrous periods of cows one month before the end of the VWP, i.e. one month prior to breeding, should be recorded to determine whether the cows are cycling, and also to ensure that oestrus detection is adequate.
- Blood stained mucous may appear from the vagina 2 days after oestrus. This should be recorded, as this sign is a valuable aid in predicting a cow's next oestrus.

Figure 1. Some behavioural signs indicative of a cow (shaded) coming into oestrus or already in oestrus (reproduced from Dairy Herd Fertility Reference Book 259, with permission of the Controller of Her Majesty's Stationery Office)



i) Sniffing of vulva or urine of other cows



v) Scuffed tail head, dirty flanks and sweating



ii) Resting chin on other cow - both cows may be coming into oestrus



vi) Bunting



iii) Soliciting



vii) Bellowing and restless



iv) Licking - both cows may be in oestrus



viii) Mounting head to head



ix) Standing to be mounted

The positive sign of oestrus is standing to be mounted

The cow in oestrus (shaded cow) stands to be mounted and does not move away.

Illustrations by courtesy of the Agricultural Training Board, UK.

OESTRUS DETECTION AIDS

There is no real substitute for skilled observation, but heat detection aids can be useful. Listed below are some useful aids:

- The presence of a bull in the vicinity of the cows. This will stimulate oestrous behaviour in otherwise quiet cows. If the bull is placed in a pen sited in such a way that the cows can pass closely and regularly, those in oestrus will generally migrate towards the bull.
- Marker animals. Vasectomized bulls (bulls which have been surgically modified so that they are unable to fertilize cows, but are still able and keen to mount them) or cystic cows can be used as heat detectors. If these animals are fitted with a "chin ball marker", they will mark the backs of those cows which they have mounted.
- Heat mount detectors. These are pressure pads in the form of sachets, containing coloured dye, which are glued in place on the tailhead. The pressure exerted by a mounting cow on this pad on the back of a cow in oestrus induces a colour change in the dye. False positives do occur, for example the banging or brushing of the detectors on obstacles such as cubicle rails. Their use is therefore best restricted to those cows which prove difficult to observe in oestrus.
- Tail "paint". A well-placed strip of paint on the tailhead is a cheap and effective aid. This paint will be rubbed off or at least cracked when the painted cow is mounted by another. Again, false positives can be a problem, as in heat mount detectors. The technique demands good management, in the sense that cows should be checked at least once a day, otherwise heats may be missed.

An alternative approach to oestrus detection, namely the control of oestrus by use of hormone-type administrations, is also available. In this way oestrus synchronization can be obtained, and insemination done at a fixed time without visual confirmation of oestrus. This technique is commonly used by veterinary surgeons for the treatment of individual cows or groups not observed in oestrus by the required time. It must be stressed that, although oestrus control enables cows to be inseminated at the optimum time, it does not improve the chances of conception/pregnancy. These synchronization techniques, used on heifers under good management, have consistently given conception rates of 60 to 70%. Much poorer results have been obtained in lactating cows. Remember that synchronization is not generally used as a blanket treatment for all dairy cows. If this technique is used, then the farmer must ensure that factors which are likely to affect conception rates, e.g. nutrition and body condition, are checked.

FURTHER READING

ESSLEMONT, R.J., BAILIE, J.H. & COOPER, M.J., 1985. Fertility Management in Dairy Cattle. London: Collins.

MINISTRY OF AGRICULTURE, FISHERIES and FOOD, 1984. Dairy herd fertility. (Reference Book 259) London: Her Majesty's Stationery Office.

LEAVER, J.D., 1983. Milk production: science and practice. New York: Longman.