

OESTRUS (HEAT) DETECTION

A farmer will never be as efficient as the bull at heat detection, but heat detection efficiency will reflect how much time goes into heat detection. Pre-mating heats will increase the accuracy and number of cows being submitted for service.

An essential requirement for the successful use of artificial breeding is **ACCURATE** and **THOROUGH** detection of oestrus.

Oestrus is defined as that period during which a cow will stand to be ridden by her herd mates or by a herd sire. It occurs every 18-24 days in cycling cows. It has an average duration of 15 hours but can vary from 2-30 hours.

Oestrous behaviour

With the approach of oestrus, most cows become increasingly restless, usually attempting to ride herd mates, especially those others which are already in oestrus.

However, when other cows attempt to mount these cows coming into heat they will move away. Once cows are in true oestrus they will stand when mounted. Because of this, they can be detected without the presence of a bull.

The oestrous cows tend to congregate together forming sexually active groups (SAG's).

These groups of restless cows move throughout the herd, with other cows joining or leaving them. Although an oestrous cow will stand to be ridden by any other cow in the herd, most of the riding in the group will be by other cows in oestrus. Cows in heat will frequently stand to be ridden by herd mates before they will stand for the bull.

As well as the riding activity, oestrous cows are more active, spend less time grazing and often have a raised body temperature. Some may bellow and many frequently change from their usual order coming into the shed to be milked. Oestrous cows often lead the herd from the paddock or lag behind. Many hold their milk for one or two milkings.

An astute observer of herd behaviour will note many of these changes in individual cows. They may also check for evidence of riding, which may cause hair removal near the head of the tail or mud marks on the flanks of the oestrous cow.

Physiological changes which may occur are a swelling of the vulva and vagina, and a discharge of strands of clear mucous from the vulva. Often 2-3 days after heat, red mucus will be seen on the hocks or hanging from the vulva.

In many cases most of these signs are obvious to an experienced stockman. However, some cows frequently display oestrous with less obvious symptoms, or the oestrus may only be of short duration.

To avoid mistakes, unless in a small herd and the cows are well known individually, it is preferable to also use one of several alternative aids for detection.

Signs of oestrus.

1. Standing to be mounted. This is the most common sign exhibited but is not 100% effective. In a trial undertaken in Australia this occurred in only 80% of cows in heat.
2. Loss of mucus. The "bull-string" may hang from the vulva of the cow in heat and is a valuable aid in detection.
3. Relaxation and reddening of the vulval lips, vulva and vagina also occurs.
4. Changes in behaviour such as tail raising, twitching, increased excitability, irritability, bellowing and increase in urine outflow all may accompany oestrous behaviour.
5. Drop in milk yield, due to decreased grazing time and milk holding.
6. Sensitivity to back pressure may increase.
7. Group behaviour such as licking, sniffing, chin rubbing and resting in groups in the paddock increases. Increased involvement in the sexually active groups in the paddock.
8. Expectation - ie. 3 weeks are up.

The good stockperson puts all the signs together to make the decision.

Abnormal oestrous behaviour

Oestrous should normally occur every 18-24 days, but the first heat after calving may be followed by a genuine short cycle of about 8-12 days.

Less than 40 days after calving the first heat may be a silent heat. A silent heat occurs when the cow ovulates without the normal signs of oestrous activity being displayed.

Abnormal ovarian conditions associated with cysts can result in frequent, irregular periods of oestrous activity. These cows can become nymphomaniacs and/or infertile and therefore should be seen by a vet. Early treatment of these cases improves the success rate considerably.

Oestrous activity is known to occur in pregnant animals in about 5% of pregnancies. These cows should be examined before it is assumed they are empty.

Oestrus duration and intensity.

One New Zealand study has shown that 22% of cows were detected in oestrus by herd owners at two consecutive milkings, and that 55% of cows were first detected as being in oestrus at the morning milking.

Errors in detection were most frequent at the morning milking. The herd owners were only uncertain of oestrus in 7% of the cows in their herds. The conception rate of this group was 55%.

Errors in detection.

1) Errors in identification.

The incorrect cow is put up due to an error in identification. The wrong cow is inseminated and the cow in oestrus is missed. The result is a lowering of the conception rate and more spread out calving pattern. This constitutes the most expensive and yet easily remedied error. Well identified cows and a notebook will prevent most of these errors.

Losses:	-21 cow days in milk @ .7 kg/d @ \$6/kg	\$88.20
	-cost of one insemination @ \$13	<u>\$13.00</u>
		\$101.20

2) Errors of omission.

A cow on heat is not seen and therefore not submitted for service. The result is a lower submission rate and therefore a more spread out calving pattern.

Losses	- 21 cow days in milk @ .7 kg/day @ \$6/kg	=
\$88.20		

3) Errors in diagnosis.

These result from too liberal interpretation of oestrous symptoms, so submitting cows when not in oestrus. The result is a lowered conception rate.

Losses - cost of one insemination@ approx \$13.00 =
\$13.00

This error type soon corrects itself as the cow comes into oestrus and is picked up correctly, which is the usual sequence of events and poses no major problems.

If however, the error sequence is reversed ie, a correct insemination is followed by an incorrect one within 21 days, the problem is more serious as the conception rate to the correct first insemination is reduced by 50%. This can be avoided by being sure the cow is in heat at subsequent matings and recording doubtful heats with a '?'.

Methods of oestrus detection.

A. Visual observation.

- During 15 minute periods before the herd is brought in for milking twice each day.
- In the yard before milking commences.
- At least once (preferably twice) between milkings.

Most cows will be detected if the herd owner is experienced, knows the herd well and the herd size is not large. It is unreasonable to expect other members of the family or employees unfamiliar with the herd to be equally competent at detecting cows on heat. In these situations an aid to detection is essential.

B. Tail painting

- This involves applying an enamel paint on the coat to lightly cover those points near the head of the tail which will be rubbed by the brisket of the riding cow when the oestrous cow stands to be ridden.
- An enamel high-gloss is the suitable form of paint to use in seasonal herds in New Zealand. There are specially formulated paints which can be purchased for this purpose. Some enamel paints are not satisfactory and roof paint may not be rubbed off. Water based paints do not last.
- The paint should be applied with a 50 mm brush, running forward for 130-150 mm from the tail head. Loose hair must be removed, and the

paint should not be applied too thickly. Suitable colours include red, green and blue, although yellow may be used on Friesians and cross-breds. The colours are alternated as cows are mated; this highlights unmated cows.

- The tail paint should last 4 weeks unless the coat hair becomes loose with shedding. In this event, the strip should be peeled off and paint re-applied. One litre of paint should be sufficient to tail paint 80-100 cows.
- The paint strip should be checked at each milking. In almost 90% of cases, most of the paint will be removed when a cow is in oestrus (even though some have not been seen to be in oestrus). A further 5% of cows will lose only a little of the paint, and with the remaining 5% experience and judgement will be necessary as the paint strip may have only been rubbed but not removed.
- The paint is only rarely removed indiscriminately. Cows detected in oestrus on one day and inseminated that morning should have their paint re-applied at the next milking, or even at the next morning's milking.
- The more cows that are in oestrus at the one time the more successful is the tail painting technique at detecting cows in oestrus. This makes it ideally suited for large seasonally concentrated calving dairy herds. It is not so successful in smaller herds or in year round calving herds.

C. Spray paint

- This is tail paint in a spray can. Although more expensive than tail paint, it is convenient and more sensitive. Therefore it is more applicable for use on heifers and after the use of CIDRs.

D. KAMAR heat detectors

- This product is a useful aid for heifer AI programmes and synchronisation programmes. It is an indicator that is pasted on to the tail head of the cow and after the cow is ridden approx three times the indicator goes red. They cost \$2-\$3 each, and are especially useful for small numbers of animals, or where observation is difficult.

E. Teaser bulls

- Teaser or vasectomised bulls are very efficient in detecting cows on heat, and therefore are a useful aid in detection.

Timing of insemination.

It is preferable to record all cows detected in oestrus since the previous milking. In most herds the cows are drafted out for insemination at the morning milking.

The cows should be kept away from the herd for as short a time as conveniently possible, as their presence in the herd promotes the formation of the sexually active groups.

Cows seen in oestrous at the morning milking should be inseminated later that morning. These cows should not be held back and inseminated later that afternoon or the next morning. However, if she is still plainly in heat at the milking following the insemination she should be drafted out and re-inseminated the next day. This should only occur in 8% or less of your herd and is best applied if the same semen can be used on both occasions.

Cows drafted out at one milking for subsequent insemination should be held close to the shed with access to feed and water.

After they have been inseminated they can then be returned to the herd. Occasionally farmers keep these close to the shed to milk them first and repaint them at the next milking. This has management advantages but reduces the formation of the sexually active groups in the paddock.

Oestrous detection is more difficult in maiden heifers and in town supply herds, mainly because the sexually active groups are less likely to be formed. For the same reasons, detection efficiency tends to decline as the breeding programme goes beyond the 7th to 9th week, as more cows become pregnant and they are less likely to partake in the groups. In these herds, at these times, it is often preferable to run the bull with the cows.

It is not unrealistic to achieve detection rates of 90%. With this achievement, calving patterns are maintained at levels which optimise production per cow per year, maintain a low empty rate and contribute to high fertility.