

Oestrus management in the dairy herd

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Successful reproduction management determines the economical viability of both dairy and beef operations. With increasing costs of feed and labour, cost management of breeding becomes a challenge for many farms. Heat detection is one of the most important factors affecting the efficacy of artificial insemination and thus pregnancy rates. Artificial insemination on the other hand is used as means to achieve genetic progress in the herd.

Pharmacological oestrus synchronisation systems allow for precise planning of breeding and calving in the herd. Moreover, some systems can be used either as tools to improve/eliminate heat detection or to treat particular reproductive disorders such as silent heat or anoestrus.

With this in view the organisational and therapeutic benefits from oestrus induction and synchronisation systems should be recognised by both large and medium sized farms.

Present trends

The main trends in the modern dairy industry are: a progressive increase in the productivity of individual animals, accompanied by increasing consolidation of production resulting in a tendency towards larger herds.

These changes result in a new dairy production environment, where animal handling and production becomes increasingly automated and time devoted to individual animals is reduced. It goes without saying that there are fewer opportunities for oestrus detection. The accurate selection of cows for breeding and getting cows pregnant within a reasonable time after calving thus becomes difficult.

Fig. 1. Oestrus management for AI with prostaglandins.

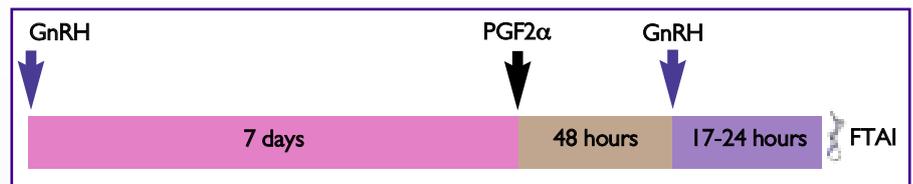
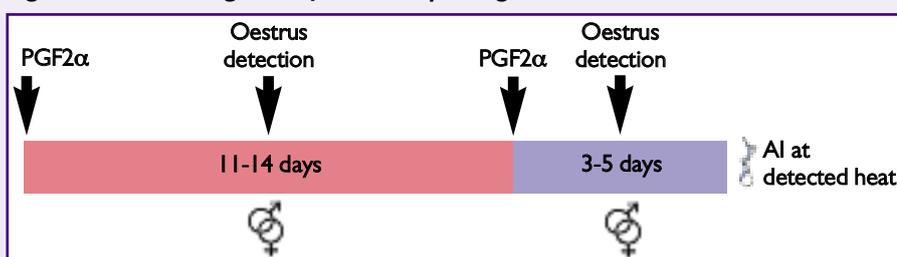


Fig. 2. Ovsynch protocol.

Various pharmacological systems allowing for oestrus synchronisation and induction of ovulation in a predictable time frame proved to be a valuable tool facilitating or eliminating oestrus detection, increasing submission rate and increasing the overall pregnancy rate per breeding period.

Such systems were eagerly adopted in countries where large dairy herds are the norm and cost of labour is a factor. It is estimated that 90% of dairy cows in the USA are subjected to some form of pharmacological oestrus management at least once a year.

In Canada, New Zealand and large herds in Brazil or Mexico the situation is similar. In Europe, some countries in Latin America and Asia pharmacological control of oestrus is adopted far more reluctantly.

This is not only due to, often confused and misinformed, consumer opinion but mainly because there seems to be a common conviction that such systems are only advantageous for the routine management of large batches of animals, offering considerable savings on labour and making sustained production feasible.

Indeed when variables such as savings on labour, management of buildings and compartments or large scale batch production are considered, the advantage of oestrus synchronisation systems is most evident in large herds.

Nonetheless, the full benefits these systems offer in modern reproduction management in medium sized dairy cattle herds are not fully exploited as they are not fully understood or noticed.

This article presents the main benefits of organisation of reproduction in the medium sized herd as well as the therapeutic application of pharmacological oestrus management programmes.

Efficiency of heat detection

Efficacy of oestrus detection in dairy and beef herds depends on many factors.

Amongst these factors, the most important but also most variable, are the time spent observing the animals, the knowledge to detect basic behavioural changes as well as the animals' housing (space to move, flooring quality, temperature).

Availability of adequate numbers of skilled personnel at the correct time is therefore essential, but also rarely possible in medium size farms.

Staff often has to divide their working hours between milking, cleaning, feeding of animals and the administration of treatments. Efficient oestrus detection becomes difficult, resulting in animals not in oestrus being elected for breeding and low pregnancy rates.

The efficiency of oestrus detection can be greatly improved with pharmacological oestrus management. Animals observed are clearly identified and the time of observation determined. The sophistication of synchronisation systems can vary, but even the simplest ones bring significant improvement.

With double injection of prostaglandin PGF2α analogue, treated cows should be expected to come in heat within 3-5 days after injection (Fig. 1).

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The animal owners have the choice of subjecting treated animals to oestrus observation after the first injection and continuing only with those not seen in heat or simply detecting oestrus signs in all treated animals after the second injection.

This system is especially suitable for dairy and beef heifers and for dairy cows in good body condition. Oestrus synchronisation with prostaglandins is only effective in animals with active ovaries (cycling).

Systems are also available that allow for the total elimination of oestrus observation. The so called Ovsynch protocol involves two GnRH (gonadotrophin releasing hormone) injections separated with a

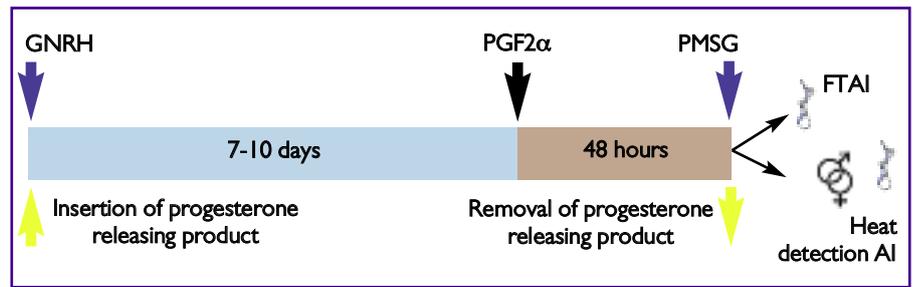


Fig. 3. Oestrus induction and synchronisation with progesterone/progestagen releasing products.

prostaglandin. Oestrus synchronisation and ovulation is tight enough for fixed time AI (FTAI) to be possible (Fig. 2). Dairy farms

that for organisation reasons cannot ensure adequate oestrus observation should be especially interested in this system.

An additional advantage of the Ovsynch protocol is the 100% submission rate. In the system based on AI at detected heat, only cows detected in oestrus are inseminated. In the case of Ovsynch all animals included in the system are eligible for insemination and served. This leads to a substantial improvement in the overall pregnancy rate in the herd.

Cyclic ovarian activity

Post partum anoestrus is a serious problem in high producing dairy herds and is a sad reality in almost all beef herds. It is not uncommon that in a standard dairy herd up to 30% of cows are not seen in heat until 50-60 days post calving.

Negative energy balance associated with milk production and inadequate feeding as well as, in the case of beef cows, the presence of a suckling calf negatively affect the release of hormones that trigger the final growth and ovulation of ovarian follicles.

Delayed first heat obviously leads to delayed breeding and is reflected as a prolonged calving interval and increased number of open days.

Pharmacological oestrus induction systems combined with corrections to feeding and management measures can bring considerable benefits and reduce the impact of anoestrus.

Of the synchronisation programmes available, those that stimulate the ovarian activity (the growth and final maturation of the follicles) and promote formation of a high quality corpus luteum after induced oestrus, should be selected.

Ovsynch protocol can be used as the GnRH injection stimulates the maturation and ovulation of the dominant follicle (Fig. 2). The results obtained in anoestrus animals are, however, lower than those achieved in cyclic cows.

Programmes based on a prolonged administration of progesterone or its synthetic analogues (progestagens), in the form of either intravaginal devices or subcutaneous implants, are especially suitable in the management of oestrus in herds where a high percentage of cows are in anoestrus.

These programmes should especially be

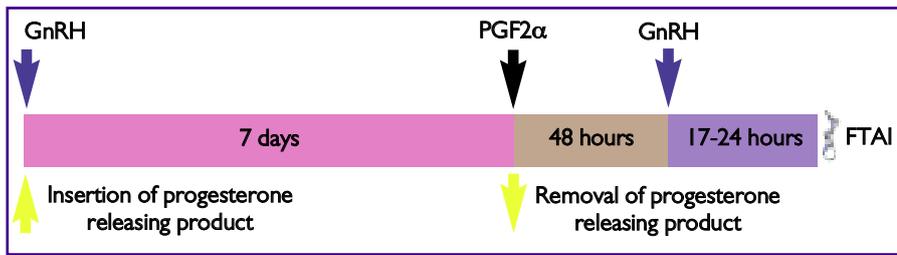


Fig. 4. Oestrus synchronisation with Ovsynch and progesterone releasing device.

considered for beef herds. The exposure to progesterone synchronises follicular growth and oestrus as well as increasing the possibility that the induced ovulation will be followed by a formation of a high quality corpus luteum.

Additional administration of GnRH at the start of the programme and PMSG (pregnant mare serum gonadotrophin) stimulate the follicular growth and induce highly synchronous ovulation (Fig. 3). Fixed time insemination is possible with many of these systems.

A combination of progesterone releasing intravaginal device and the Ovsynch protocol is especially useful in dairy herds, where access to the cows is easy and a poorly functioning corpus luteum frequently contributes to early embryonic losses (Fig. 4).

Silent heat, suboestrus

Silent heat describes a clinical picture where cows come into heat regularly but the behavioural signs displayed are of low intensity (suboestrus) or almost unnoticeable.

In such cases systems allowing for fixed time insemination such as Ovsynch and some progesterone based systems are of great value.

In such cows, synchronisation systems with fixed time insemination are often the

only chance to breed these cows within a reasonable time after calving. Premature culling due to reproductive failure is also avoided.

Cystic ovarian disease

Cystic ovarian disease can be a real problem in dairy herds leading to extended calving to conception intervals of up to 60 days and estimated losses of \$55-160 per lactation.

As ovulation failure is the direct cause of the cyst formation, oestrus synchronisation systems such as Ovsynch that include administration of GnRH provide the necessary ovulation induction and are especially

useful in the treatment of this disorder (Fig. 5).

Moreover, as the development of a new dominant follicle is initiated through the Ovsynch protocol and its ovulation is at a predictable time, the timely re-introduction of treated cows into breeding is ensured. This in turn increases their chances for pregnancy and shortens the calving interval.

Conclusions

Apart from organisation of breeding on large farms where production is operated in the batch system, oestrus induction and synchronisation systems can also be of great help in the routine insemination programmes of medium sized herds.

As these systems regulate the endocrine and morphological events during oestrus cycle, they can also be successfully used to treat disorders such as silent heat, anoestrus and cystic ovarian disease.

Synchronisation programmes that allow for fixed time insemination can result in improved insemination efficacy in herds where poor oestrus detection rates contribute to low reproduction results. ■

Fig. 5. Treatment of cystic ovarian disease with Ovsynch protocol.

