

Oestrous Synchronisation or Timed Insemination

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In Ireland, less than 20% of calves in beef herds are bred from AI. Such low usage of this effective technology most likely reflects the difficulty and labour requirements for heat detection, assembly of cow(s) for insemination as well as land fragmentation in beef herds. Synchronisation is a process that aims to reduce the labour requirement and make AI more accessible to beef farms.

What is Heat Synchronisation?

Simply put 'oestrous or heat synchronisation' is the process of manipulating the oestrous cycle of the cow by the use of synthetic hormones in order to better manage the timing of breeding.

Why should a farmer consider using synchronisation?

- So he/she can plan the dates to best suit the availability of labour on the farm
- With timed AI all cows can be bred on a predetermined day, regardless of whether they showed heat or not
- It can also be used to induce heat in anoestrous cows. However, conception rate achieved at the induced heat in such cows is generally lower than cows that are cyclic, fertility at subsequent repeat heats is normal (55-70%)
- Increasing the use of AI means you can have a more targeted breeding policy
- You can use more bulls of higher genetic merit
- You can have a more focused replacement policy
- It helps to shorten the breeding season and compacts the following calving season
- For larger herds the need for a number of natural service bulls can be reduced and thus the quality improved

How does it work?

In order to develop and test a robust and repeatable timed AI program for Irish suckler beef farmers, Teagasc conducted a large on-farm trial which involved timed AI of over 2,200 cows on 85 herds throughout the length and breadth of Ireland. The protocol in Table 1 (below) is the outcome of this work. An overall pregnancy rate of 55% to the timed insemination was achieved, which is very acceptable considering that in the region of 50% of the treated cows were anoestrous (hadn't resumed normal heat cycles) at the start of the regimen. When combined with repeat breedings, 80% of synchronised cows were pregnant in the first three weeks of the breeding season, which obviously has very positive benefits for average herd calving interval and the subsequent calving season.

Table 1. Recommended synchronisation regimen for beef cows ≥ 35 days calved at time of treatment

Day	Action
Day 0, am (Monday)	Progesterone device insertion + GnRH at insertion
Day 7, am (Monday)	Progesterone device removal + prostaglandin + 400 iu eCG (also known as PMSG) i.m. at time of removal (Ideally tail paint cows or affix heat detection patches to cows)
Day 8 (Wednesday)	Cows will start to show standing heats late pm and through the night. Record cows in heat and active
Day 9 (Thursday)	Most heats expected. Inseminate all cows observed in heat in the evening of Day 9 and on Day 10. Heat check cows and record all cows active or in heat (if required). Alternatively, inseminate all cows at 72 hours following progesterone insert removal and administer GnRH to cows not yet observed in heat.
Day 10 (Friday)	Continue heat detection and inseminate cows observed in heat. Alternatively, inseminate all cows not observed in heat at 72 hours post Progesterone device removal and administer GnRH to these cows at time of insemination. If heat detection is not possible, all treated cows can be inseminated once at 72 hours (or as close as possible to this time), though GnRH must be administered to all cows.
Notes <ul style="list-style-type: none">• All drugs are Prescription Only Medicines (POMs) and are under veterinary control.• Dosage of drugs: will vary according to drug and drug formulation.• Inadvertent administration of prostaglandin to a cow/heifer during the first 3-4 months of pregnancy will cause abortion.	

For best results with oestrous synchronisation in beef cows, it is recommended that:

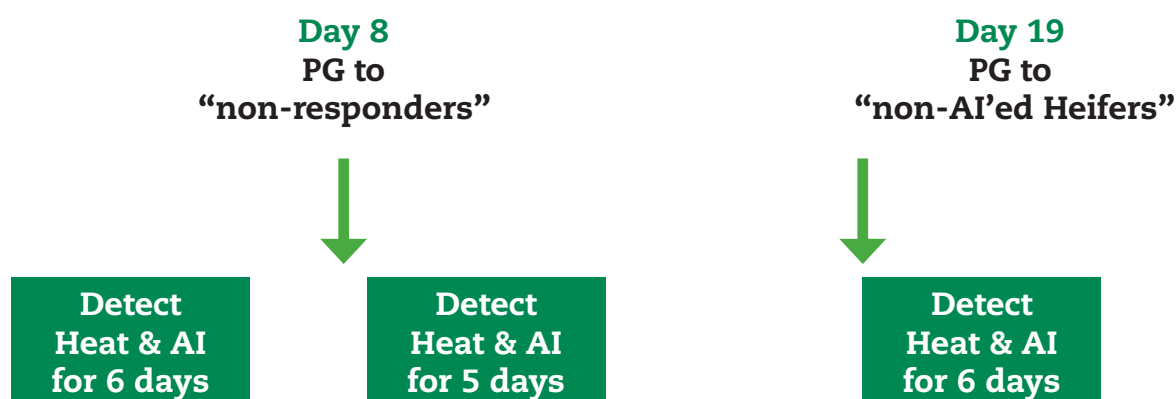
- Cows are in a moderate BCS score (2.5 –3.0) at time of treatment. It is equally important that cows are a minimum of 35 days calved at time of progesterone device insertion and are on a good plane of nutrition (plentiful supply of grass) for a minimum of 3-4 weeks prior to, during and after treatment.
- Synchronisation should only be used in herds where the level of management and in particular heat detection skills are high in order to detect heats and particularly repeat heats. Alternatively, a bull should be turned out with cows 7-10 days following the initial AI.

It is vitally important that high fertility semen is used and the competence of the inseminator is high. Semen must be thawed carefully (15 seconds in water at 35°C) and the cow inseminated within 1-2 minutes of thawing. The correct site for semen deposition is in the common body of the uterus. Each straw should be thawed separately.

Synchronisation regimens for replacement heifers

As the vast majority of replacement heifers should be cyclic during the breeding season there is a reduced requirement for incorporating an exogenous source of progesterone in the regimen for heifers. Consequently, prostaglandin-based regimens are the method of choice for use on replacement heifers. A very cost effective regimen involves good heat detection initially carried out for 6 days and all heifers detected in heat inseminated. On the 6th day all heifers not yet detected in heat are injected with prostaglandin. The injected heifers will respond to the prostaglandin and show heat 2-4 days after injection and should be inseminated as normal; conception rates of 65 to 70% should be expected. The remaining heifers not yet recorded in heat and inseminated can be treated with a 2nd prostaglandin injection 10-11 days (see Figure 1) after their initial injection. Up on 80% of the heifers will respond to one or either injection of prostaglandin. Using this protocol drug use, semen costs and veterinary costs are minimised.

Figure 1. Alternative prostaglandin-based regimen for replacement heifers.
(More cost effective)



It is important that replacement heifers are well-grown (minimum 350-400 kg depending on breed type) and are regularly cyclic.

There is an option to use a progesterone device in heifers using a similar protocol to what was outlined for the cows.

The options are to:

- i.** Heat detect and AI as normal, any heifers not showing heat inseminate at 72-84 hours after device removal and administer an injection of GnRH; **OR**
- ii.** Avoid heat detection and inseminate all heifers at 55-60 hours after device withdrawal. GnRH must be administered at insemination. This approach will ensure a 100% submission rate and induce ovulation in some non-pubertal heifers. Pregnancy rates of over 70% have been achieved at Grange, to a single timed insemination in 15-16 month old beef heifers using this regimen.

It is imperative that heifers are bred to easy calving sires, as dystocia or calving difficulty can be four-fold higher in heifers than in more mature cows.

