

Hormonal methods

- 1- **Progestogens:** Progesterone and progestational compounds have been used extensively in most domestic species as a method of controlling the oestrous cycle, particularly synchronisation within groups of females. In general, the principle behind their use is that the exogenous progestogens act in the same way as a CL, resulting in a negative feedback effect upon the anterior pituitary and a suppression of cyclic activity initiated by the release of gonadotrophins. When the source of progestogen is withdrawn, or its effect declines, there is a return to cyclic activity.
- 2- A **progesterone-releasing intravaginal device (PRID)** consists of micronized progesterone distributed homogeneously in an inert silicone rubber coated onto a cylindrical stainless spiral coil. The PRID is maintained in the vagina for 7 days, and a luteolytic dose of $\text{PGF}_{2\alpha}$ is administered 1 day before or at "pull-out" day. There are no milk or meat withdrawal requirements. In noncycling animals, an injection of equine chorionic gonadotropin (eCG) is administered when the PRID is removed.

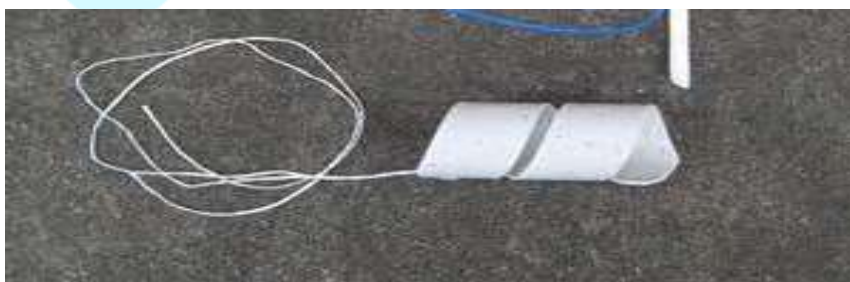
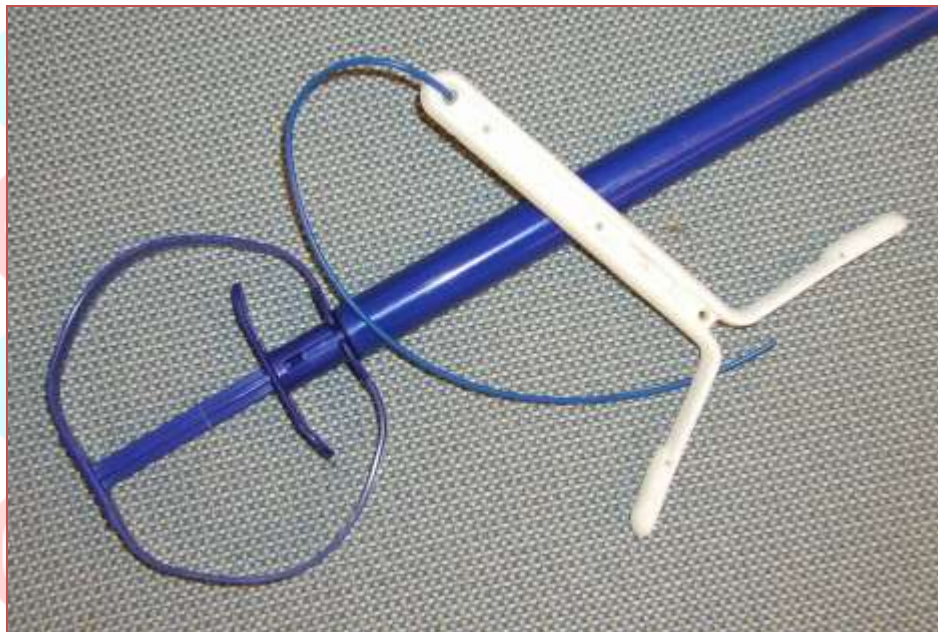


圖1- PRID

- 3- A **controlled intravaginal drug-release (CIDR)** device may also be used for estrus synchronization. A CIDR is an intravaginal device constructed of a progesterone-impregnated medical silicone

elastomere molded into a T-shape. It is labeled for estrus synchronization in beef and dairy cattle. Cows are administered GnRH, and concomitantly a CIDR is inserted and maintained for 7 days. At the time of removal, cows receive an injection of PGF_{2α}. Cows can be inseminated, with or without another GnRH injection, 48–72 hr after PGF_{2α} injection. The most effective synchronization treatment, an IM injection of a combination of 5 mg estradiol valerate and 3 mg norgestomet, with an ear implant of 3 mg norgestomet left in for 9 days, is no longer commercially available in the USA because of the ban on the use of estrogens in food animals.

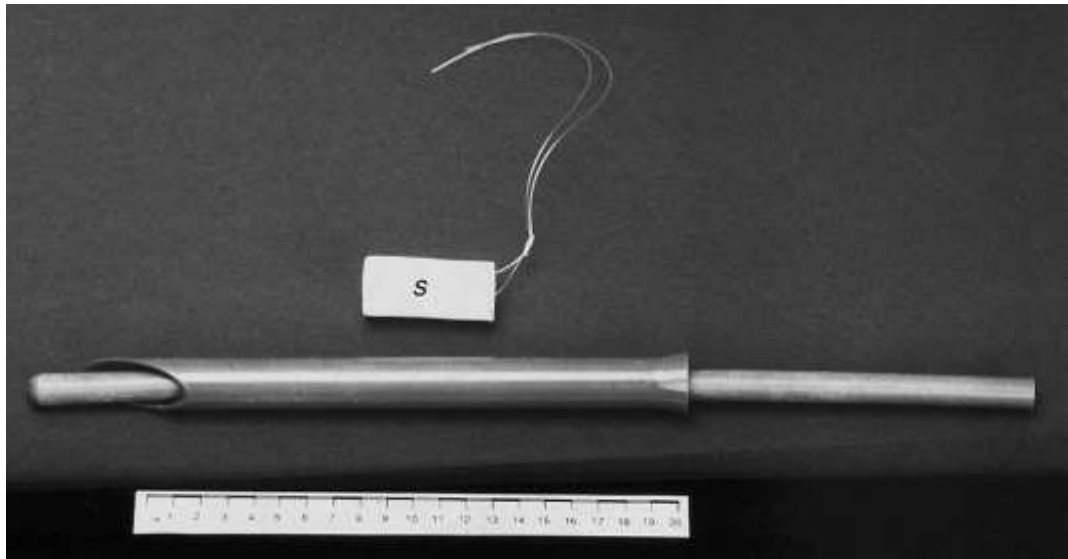


- a- **Melengestrol acetate (MGA)** is a steroidal progestagen used as a feed additive to promote growth and suppress estrus in heifers. MGA is used at a dosage of 0.5 mg/head/day for 14 days for estrus synchronization. Fertility after this treatment is low, and females should not be bred. This protocol could be improved by

administering PGF_{2α} 17 days after the last feed containing MGA. The fertility of this estrus is reestablished.

- b- **The SYNCRO-MATE-B** system differs significantly from the MGA-prostaglandin method, although producers can enjoy just as successful results. It involves using both a subcutaneous implant inserted in the female's ear for nine days, plus an intramuscular injection administered at the time of implant insertion. The SMB treatment of cycling heifers is usually followed by a high incidence of estrus during the five days following implant removal. The SMB treatment works best (results approach 100%) when administered after day nine of the estrous cycle, explains Beal. However, "when a heifer happens to be on day three or day four of the estrous cycle when she starts on SYNCRO-MATE-B, her chances of showing a synchronized estrus drop to less than 66 percent," says Beal. Beal points out that these three most common approaches of synchronization vary greatly, and he offers several tips on what works best in the following scenarios.
- c- **Intra vaginal sponge** :in small ruminant the most of the progestational substances are administered via the intravaginal route in the form of impregnated sponges or tampons





4- Prostaglandins:

Since the length of the interoestrus interval in most domesticated species is controlled by the duration of the life span of the CL, premature lysis, induced by the administration of PGF₂ α or its analogues, can be used to manipulate the normal pattern of cyclic activity.

Two Injection PGF Programs The two injection programs for synchronization with PGF are designed to increase the proportion of females with a CL that is responsive to regression with PGF. Traditionally, the recommendation was that two injections of PGF be administered 11 days apart, but recent data suggest that a 14-day interval is more effective. With the first PGF injection, ~70% of the cyclic cows would be expected to display heat (those on Day 6 or greater of the cycle at injection) during the next four to five days. Those animals that were not responsive to the first injection (i.e., on Days 1 to 5 of the cycle at the first injection) would respond to the second injection. Also, cows in heat after the first injection would be on Day 6 or greater of their next estrous cycle and would be expected to show heat a second time, following the second PGF injection.

1- Melatonin

The pineal gland controls reproductive activity in seasonal breeding species such as sheep, goats, horses and cats by the secretion of melatonin.

Perhaps not surprisingly, it cannot be used to modify seasonal activity in the mare because it would be necessary to inhibit the secretion of melatonin or neutralise its effect to advance the time of onset. However, in the ewe and doe, which are short-day breeders, it has been used commercially to advance the timing of the onset of the breeding season. The hormone is administered as an implant containing 18 mg of melatonin which is inserted subcutaneously at the base of the ear.

It is critical that rams (and bucks) should be separated from the ewes so that they are out of sight, sound and smell at least 7 days before the insertion of the implant. They must remain separated for at least 30 days and not more than 40 days, when rams (or bucks) should then be reintroduced. Peak mating activity occurs 25–35 days later. Melatonin should not be used in ewe lambs.