

# Oestrus synchronisation in small ruminants

Recommended Instructor to student ratio 1:<35

## Category

3. Minor conscious intervention

## Objective

To achieve synchronised oestrus and ovulation in a majority (large proportion) of females in a flock (usually ewes or does) in preparation for insemination either by a male or by artificial insemination (AI). (See CSU ACEC SOP 062.)

## Alternatives to animal use

Practice on abattoir specimens prior to demonstration on females. Previous anatomy and associated course work.

## Details of procedure

The procedure requires synchronisation of oestrus within the mob of females

## Procedure

### 1. Synchronisation of oestrus

There are two approaches to controlling the time of oestrus in females.

- I. Progesterone or compounds with progesterone-like activity (progestagens) are administered for 12-14 days. Due to feedback on the hypothalamus and pituitary, the females do not come into oestrus during treatment. By the end of the treatment period, the female's corpus luteum will have regressed, regardless of the stage of the cycle at which treatment commenced, and cessation of the treatment should result in all females coming into oestrus in the next 2-3 days.

There are two ways of administering progestagens. The more common way is to insert a polyurethane sponge, pessary or controlled internal drug-releaser (CIDR) (or similar device) impregnated with an appropriate dose of progestagen into the vagina of the female. This might be applied via a specifically designed applicator, or via careful dextrous manual introduction into the female vagina. Dip the device applicator into a non-irritating antiseptic solution. Place the device into the applicator so that the short legs of the device are folded together with only the tips protruding from the applicator. Dip the tip of the loaded applicator into a suitable veterinary obstetrical lubricant. Wipe the vulval lips with a disposable tissue and insert the loaded applicator, sloping slightly upwards, through the vulva and then forwards, without forcing, into the forward portion of the vagina. Release the device by depressing the applicator plunger leaving the cord protruding from the vulva. Repeat disinfection of the applicator before each insertion

The progestagen devices are removed after the designated time (typically 12-14 days after application in ewes, and 18-21 days in does) by placing tension on the string or other part of the device that protrudes from the vulva. A slight vaginitis is normal, with associated discharge occasionally detected.

Less commonly, progesterone is formulated in a solid, slow-release vehicle and implanted under the skin. Females commence coming into oestrus 24-36 hours after removal of progesterone sponges or CIDRs (progestagen delivery device), with a peak at 48 hours, and nearly all females should enter oestrus by 60 hours.

If control over the time of oestrus is sufficiently precise, it is not necessary to use teaser males/ wethers and observe oestrus, the females being inseminated at a fixed time after sponge or CIDR removal. Usually a minority of treated females fail to exhibit oestrus but may still become pregnant if inseminated. The precise time of fixed-time inseminations varies with the type of synchronisation treatment and the processing of the semen, but females are typically inseminated at 48-60 hours post progestagen removal.

Progestagen treatment is often augmented or accompanied by either GnRH, or more commonly equine Chorionic Gonadotrophin/Pregnant Mare Serum Gonadotrophin (eCG/PMSG) at doses of 100-600 IU.

- II. The second and less commonly used approach to controlling oestrus is to administer a single dose of prostaglandin. This induces luteolysis, and the female returns to oestrus. However, prostaglandins are only effective when given more than 4-5 days after oestrus, so in order to get all females into oestrus at the same time a second prostaglandin treatment must be given, preferably about 11-12 days after the first. Prostaglandins are only effective in females that are cycling regularly and may cause abortions if given during the first 60 days of pregnancy in ewes. It can induce abortion in does anytime during pregnancy as the corpus

luteum maintains pregnancy for the entire duration of gestation. They do not give sufficient control over the time of oestrus to enable fixed-time inseminations.

## 2. Identification of females in oestrus

Accurate and early detection of oestrus is essential. Oestrus can be detected by vasectomised males (teasers) wearing harnesses with marking crayons. The choice of hot, cold or milk crayons is important. Alternatively, natural service or fixed time artificial insemination (FTAI) is carried out on the females.

## 3. Insemination

Natural service, detected oestrus insemination, or FTAI is carried out on the synchronised females.

**Goats:** Insert Eazi-Breed CIDR devices during the breeding season and leave in place for 18 to 21 days. The majority of does will be in oestrus approximately 48 hours after device removal. For AI using frozen semen, it is recommended that pregnant mare serum gonadotrophin (PMSG) 200 to 400 IU be given up to 48 hours before device removal. Insemination using a laparoscopic or cervical technique should be performed within 48 hours after device removal.

**Sheep:** Insert Eazi-Breed CIDR devices during the breeding season and leave in place for 12 to 14 days. Ewes will be in oestrus for mating or insemination approximately 54 hours after device removal. For spring joining, it is recommended that the device be used in conjunction with PMSG 400 to 600 IU. A ram to ewe ratio of at least 1:10 is recommended for synchronised mating. For AI using frozen semen, PMSG 400 IU is recommended at device withdrawal. Laparoscopic insemination should be performed from 47 to 55 hours after device removal.

## Drugs, chemicals or biological agents

- CIDR's- progesterone containing devices (Controlled Internal Drug Release)
- Sponges- containing flourogestone acetate, medroxyprogesterone acetate.
- Other proprietary progestagen containing devices commercially available.
- Prostaglandin F2 $\alpha$ - analogues or synthetic.
- Antiseptics and paper towel as necessary.
- Obstetrical lubricant.

## Animal Wellbeing

The procedure/s is/are well tolerated in NON PREGNANT animals. However, conception rates are variable and females will require special management to reduce lamb losses.

## Pain Relief

Not needed. The procedure should not cause pain. Hygiene and cleanliness are encouraged.

## Animal Care

Females are typically mustered and held in collecting yards/pens as necessary. They should not have excessive restrictions from food, and water should be freely available. Adverse reactions are rare.

## Reuse and repeated use

Typically the devices/drugs are only placed once at predetermined times, with the exception of the two dose prostaglandin protocol. Animals that are not pregnant or do not come into oestrus can be resynchronised.

## Qualification, experience or training necessary to perform procedure

Operators should be familiar with the correct techniques and the anatomy and physiology of the female before attempting this procedure.

Reference Miller, SJ (1995) 'Artificial breeding techniques - Sheep' in Compendium of Approved Procedures, CSIRO Division of Animal Health, Armidale pp. 58:71-58:83.