

HORMONAL CONTROL OF EWE REPRODUCTION

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Whenever hormonal control of ewe reproduction is practiced, fertility in the ewe may suffer. This may be realized in the form of lower conception rates (percentage of ewes who actually become pregnant may be lower), and or smaller lamb crops (which may be due to fewer number of female eggs per ewe actually being fertilized). Hormonal control of ewe reproduction should have no effect on embryo survival or lamb mortality.

1. INDUCTION AND SYNCHRONIZATION OF ESTRUS IN ANESTROUS (OUT OF SEASON) EWES

PROGESTERONE (or progestins)

Progesterone is the natural hormone produced by the corpus luteum (CL) of the ovary following ovulation and sustains pregnancy. When progesterones are introduced artificially, they fool the body into thinking it is pregnant and the animal will not ovulate or come into estrous (heat). When the progesterone source is totally removed, the body realizes it is no longer pregnant and will ovulate within a very predictable period. Progestins refer to the synthetic compounds with the properties of progesterone. These substances mimic the function of the CL.

The effectiveness of a progesterone to serve as a synchronization agent is related to: (1) its ability to delay estrus and ovulation, (2) the means by which it must be administered, (3) how long it must be administered, (4) how rapidly it can be removed from the ewe's system and (5) its effect on subsequent fertility.

Several approaches to deliver progesterones include: (1) intravaginal sponges or pessaries impregnated with the progestin fluorogesterone acetate (Chronogest or Repromap), (2) intravaginal CIDR, a silicone T shaped device impregnated with natural progesterone, (3) silicone ear implant impregnated with norgestomet (Synchromate-B), (4) the feed additive melengestrol acetate (MGA) fed at .25-.30 mg/hd/day for 10 days.

Estrous Synchronization with Vaginal Sponges, CIDR or Synchromate-B (SMB)

Traditional Method

- Day 1 Insert sponge, CIDR or whole SMB implant for 12 days. (Use clean technique!)
 Lubricate sponges and CIDRs and insert at an upward angle.
- Day 3 Inject Prostaglandin (Lutalyse 3cc or Estrumate .6cc).
- Day 12 Remove sponge, CIDR or whole SMB implant and inject PMSG (400 i.u.) or PG-600 (400 i.u. PMSG + 200 i.u. HCG).
 Remove sponges and CIDRs gently at a downward angle. If not visible or whole, LOOK by using forceps/finger. Dispose by burning. Slit over end, top or side of SMB implant with scalpel to remove SMB implant. Make sure it is completely removed with no slivers remaining in the ear
- Day 13 Introduce teaser ram to better synchronize ewes and to mark ewes as they come into heat.
- Day 14 Inseminate ewes 52-55 hours after progestogen removal, (51 hrs for CIDR, 52 hrs for SMB or sponge) or 10-18 hrs after ewe is marked by teaser ram.

Day 24 Reintroduce teaser ram and then inseminate 10-18 hrs after ewe is marked or introduce fertile ram, (1 ram to 5 ewes).

Follicular Wave method

- Day 1 Insert sponge, CIDR or whole SMB implant for 12 days. (Use clean technique!) Lubricate sponges and CIDRs and insert at an upward angle.
- Day 6 Remove sponge, CIDR or whole SMB implant and inject PMSG at above dosage.
- Day 7 Inject Prostaglandin at above dosages 24 hrs after sponge removal and PMSG injection.
- Day 8 Introduce teaser ram to better synchronize ewes and to mark ewes as they come into heat.
- Day 9 Inseminate ewes at approximately 48 hours after prostaglandin injection or 10-18 hrs after ewe is marked by teaser ram.
- Day 19 Reintroduce teaser ram and then inseminate 10-18 hrs after ewe is marked or introduce fertile ram, (1 ram to 5 ewes). Ewes will recycle from 15-18 days after last breeding.

Estrous Synchronization by Feeding MGA

Keep ewes away from rams for 2 months.

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| Day 1 | 6 am | Begin feeding MGA .15 mg/head every 12 hrs for 8 - 12 days. Feed no urea or copper |
| Day 8/12 | 6 am | Last feeding of MGA |
| Day 9/13 | noon | 30 hrs after last feeding inject ewes with PMSG or PG-600 and introduce teaser rams if using A.I. |
| Day 10/14 | | Inseminate ewes 24-36 hrs after injection either artificially or with fertile rams (1 ram to 5 ewes) |

Since MGA clears the GI tract of individual ewes at different rates, it is difficult to predict the exact time of ovulation when you stop feeding MGA. This makes successful A.I. difficult. Estrous synchronization in sheep by feeding MGA should probably be reserved for mating naturally with rams until more research can be done.

2. SYNCHRONIZATION OF ESTRUS IN ESTROUS (IN SEASON) EWES

PROGESTERONE(or Progestins) + PMSG or PG 600 injection

see above

PROSTAGLANDIN

The mechanism of action for prostaglandins is to induce the regression of (destroy) the CL, thus interrupting the existence of progesterone from the CL and telling the body that no pregnancy exists. The ewe will ovulate within a very predictable time. It is completely ineffective in non-cycling ewes when no CL exists. When a single treatment of prostaglandin is given to a flock of cycling ewes, 60 to 70 percent of the flock will exhibit a synchronized estrous beginning 30 to 48 hours later. If complete synchronization of the flock is required, 2 treatments 9 days apart are needed. Combining a seven day vaginal pessary, CIDR or SMB implant of progestin with prostaglandin is also effective.

Estrous Synchronization with Lutalyse or Estrumate

- Day 1 Inject Lutalyse at 15 mg. = 3cc or Estrumate at 150 mg. = .6cc
(intramuscular injection)
- Day 10 Inject Lutalyse at 15 mg. = 3cc or Estrumate at 150 mg. = .6cc
- Day 11 Introduce teaser ram
- Day 12-14 Inseminate ewes 10-12 hrs after ewe is marked by teaser ram
(ideal time = 42 hrs after last injection). Heat lasts 18 - 36 hrs,
but fertility decreases with each hr.
- Day 27-30 Watch for teaser marks and inseminate 10-12 hrs later

TEASER RAMS

Breed 8-12 hours after mark as the ewes naturally come into heat.

3. INDUCTION AND SYNCHRONIZATION OF ESTRUS IN EITHER ANESTROUS OR ESTROUS EWES

GONADOTROPINS

Gonadotropins may be classified as those which:

- a) stimulate follicular development and
 - b) those which induce the follicles to ovulate.
- a) Gonadotropins which stimulate follicular development are used when follicular development may be a limiting factor in the breeding program as in anestrus and prepuberal ewes or when a superovulatory response is required for embryo transfer. These gonadotropins will cause follicles to develop regardless of the reproductive state of the ewe (i.e., prepuberal, anestrus, cycling, pregnant, etc.). The gonadotropins which perform this function include pregnant mare serum gonadotropin (PMS or PMSG) and follicle stimulating hormone (FSH).
 - b) Gonadotropins which will induce follicles to ovulate are used regardless of the reproductive state of the ewe. There must be a follicle available to ovulate. A proportion of prepuberal ewe lambs, anestrus ewes, cycling ewes and even pregnant ewes will always respond to these gonadotropins by ovulating. The ewes which ovulate **do not show estrus** prior to ovulating. Therefore, this category of **gonadotropins must be used in conjunction with other treatments to work effectively** in a hormonally controlled breeding program. The gonadotropins which induce follicles to ovulate include luteinizing hormone (LH), human chorionic gonadotropin (HCG) and gonadotropin releasing hormone (GnRH).

Estrous Synchronization with PMSG, FSH, PG 600

Give as an intramuscular injection when Progesterone sponges, CIDRs and implants are removed.

Dosage for PMSG and FSH = 400 i.u. to 750 i.u.

Dosage for PG 600 = 5 cc (same as full swine dose) for ewes under 250 lbs. , 6 cc for ewes over 250 lbs. (PG 600 has 400 i.u. PMSG and 200 i.u. HCG per 5 cc). **DO NOT OVERDOSE!**