Estrus synchronization

Estrus synchronization with prostaglandin

 Prostaglandin F2a (PGF2a) is considered to be the natural luteolysin, produced by the endometrium in increasing amounts during the late luteal phase in non-pregnant animals.

 PGF2a, released into the uterine vein, serves to reduce arterial blood supply to the CL, reduces progesterone production & finally causes regression of the corpus luteum. PGF2a exerts a negative control over the CL that prevents any stimulatory effect of LH on progesterone production. After luteal regression the withdrawal of progesterone then allows initiation of a new follicular phase, the animal exhibits estrus, & then ovulates to begin a new cycle.

 The exogenous prostaglandins have the same pharmacological action as the endogenous one. The prostaglandin binds to receptors on the mature CL & basically kills the corpus luteum. As progesterone falls, follicles grow & the cow comes into heat.

- Anytime a mature CL is present prostaglandin will lyse it & allow the cow to come into heat. The best estral response is when the drug is given after day 8.
- Any dominant follicle can potentially ovulate if the exogenous prostaglandin is luteolytic. However, once a dominant follicle has become static for 2 days or is regressing, a new follicle must be recruited that will ovulate if the CL is lysed. This varying dominant follicular response

Improving ovulation synchronization
 48 hours after PGF2a Give GnRH
 Cause LH surge; achieved slight increase in conception rates

Prostaglandins Products

 The products generally available are 'Lutalyse' which is the natural PGF (dinoprost tromethamine). The dose is 25 mg or 5 cc IM.



'Estrumate' is the prostaglandin analogue cloprostenol. The dose is 500 mcg or 2 cc IM



Bovilene is the prostaglandin analogue fenprostalene. The dose is 2 cc (1mg)SQ. This is a longer acting product and was first approved as an abortifacient.
Prosolvin ...analogue 15 mg dose I.M.
Equimate ...analogue used for equine.

The choice of the suitable PG synchronization program depends on

The % of group) of animals wanted to be in estrus in specific time)
the available personals
labor & money.

The suitable PG synchronization program

One or two shots of PGF
 Random injection or after palpation of CL
 Periods of heat observations

Lutalyse



Combinations of GnRH and PGF



"Ovsynch" System

- The injection of GnRH causes all estrogen dominant follicles to ovulate, recruits new follicles, & luteinizes 'old' follicles.
- On day 7 a PGF injection is given. Since the follicles have been luteinized & the follicular waves have been synchronized, all the cows should come into estrus & ovulate at the same time.
- A second GnRH injection 48 hours after the PGF injection helps ensure ovulation.
- If time breeding is desired, then the cows can be bred 16 hours after the GnRH injection. Conception rates of 50% have been reported in initial trials.



"Ovsynch" variation using second estradiol benzoate instead of second dose of GnRH

- Cows treated (Day 0), at random stages of the estrous cycle, with 8 mg of buserelin acetate (GnRH agonist)
- Seven days later (D 7) all animals were treated with 25 mg of dinoprost trometamine (*PGF2* alpha)
- The cows from received one injection of estradiol benzoate on day 8.
- AI was performed at 30 to 34 h after the estradiol benzoate injection.

 Pregnancy rate was 43.3% for timed AI (compared to 47.7% obtained after regular "Ovsynch" GnRH.





Mare estrus synchronization:

Use of prostaglandins in horses:
 – Equimate (Fluprosterol)
 – Other prostaglandins ~1/5 cow dose
 – Mare C.L. more sensitive

Product

Prostaglandins: Lutalyse [®] Estrumate [®] IN-SYNC [®] Progestins: CIDR[®] MGA ^{® ©}

GnRH: Cystrolrelin ^{® <u>d</u> Factrel ^{® <u>d</u> Fertagyl ^{® <u>d</u>}}}

Dose^ª

5 mL, im 2 mL, im 5 mL, im

Vaginal insert^b 0.5 mg/hd/day, oral

2 mL, im or iv 2 mL, im 2 mL, im or iv

Approved Label Use

beef heifers and cows beef heifers and cows beef heifers and cows

beef heifers and cows beef heifers (estrus suppression only [©])

bovine females dairy females bovine females

