

Estrous synchronization

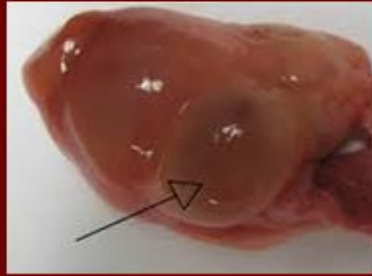


Estrous synchronization

- **Definition:** a management technique that make use hormone to occurrence or induction of **ESTRUS** in all of the females in a group at the same time
- So called estrous synchronization in polyestrous animal and **in season** breeding in seasonal polyestrous animals
- but called estrous induction **out season** in seasonal poly estrous

Basis for Synchronization of Estrus

- Manipulate life span of CL
- Manipulate growth of follicles and timing of ovulation



Advantages of estrous synchronization

- 1- Reduced estrous detection
- 2- Can synchronized large group to ovulate at the same time (ovasynch)
- 3- Short calving season
- 4 – Reduce labor required and overall management problems for artificial insemination(AI) breeding
- 5 - Necessary for embryo-transfer programs.
- 6 – Improves management practices (cattle grouped –closer observation , better feeding practices , etc)
- 7 – Market uniform calf crop (same age)

Disadvantages

- 1 – low conception rate
- 2 – High cost (hormone)
- 3 – Concentration labor required during breeding and calving season

Requirements for success

- 1– Need fertile heifers and cows
- 2–Need quality semen for AI and experienced inseminators.
- 3 –Need healthy, aggressive, fertile bulls
- 4- Hormones used to treatment
- May result in lower pregnancy rates if procedures are not followed

Compounds used in synchronization

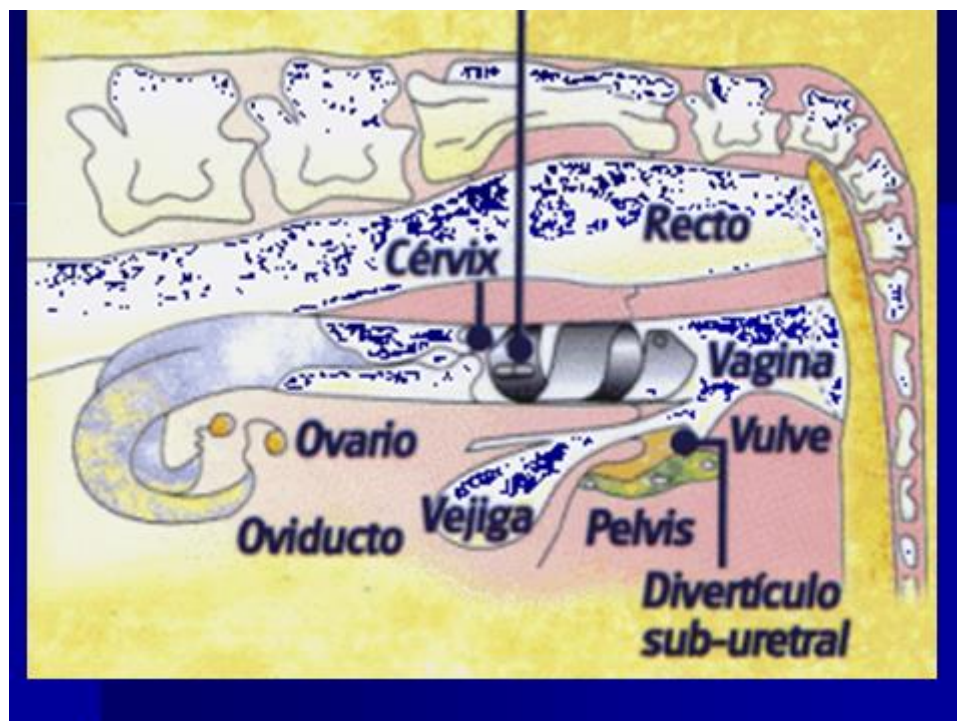
1- progesterone

A – natural progesterone :
neutralizes the corpus luteum and
its natural production (progesterone)
to rearrange cycle used in cattle

1- (PRID) progesterone releasing
intravaginal device



2 – (CIDR) controlled internal drug
releasing



What CIDR



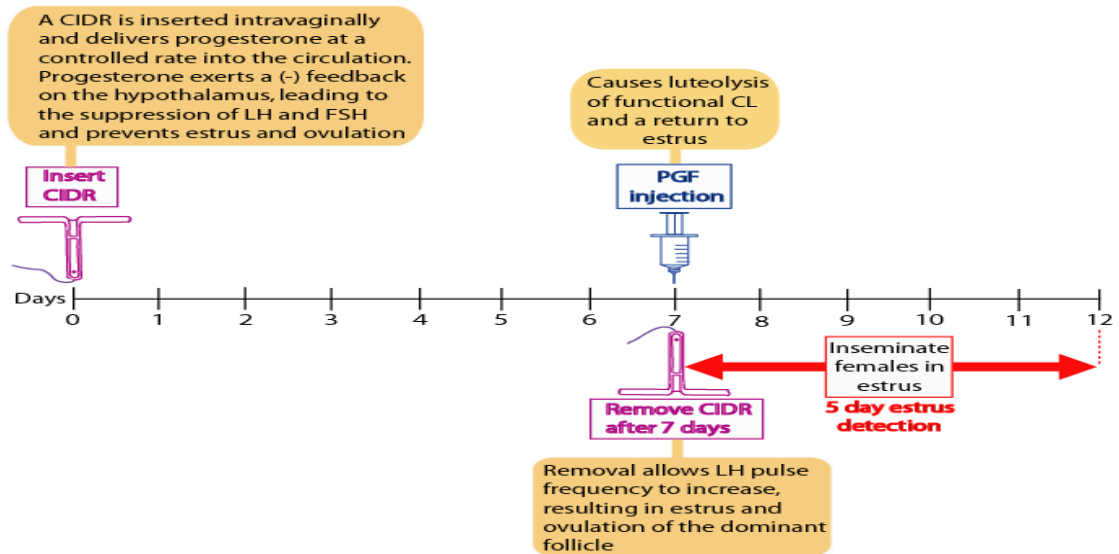
- 1 - **CIDR** (controlled internal drug release) T shape device
- 2 – Nylon spine cover by a progesterone impregnated silicone skin
- 3 - Easy application & removal
- 4 - Delivers natural progesterone (1.38 ng)
- 5 - Slow release 7 day duration
- 6 - Prevents estrus expression & induces cycles
- 7 – blood progesterone level rise rapidly upon insert of CIDRS

CIDR's with other Treatments

“Estradiol benzoate (EB) administered after CIDR insert and PG on day 7 increased conception rates in heifers.

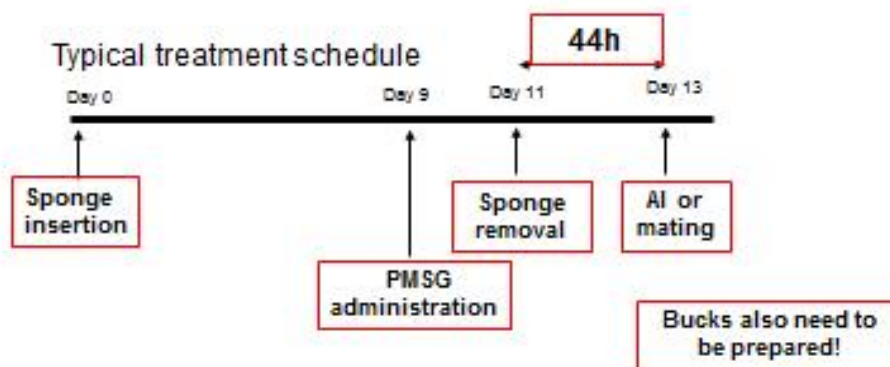
“Administration of EB at CIDR insertion increases TAI pregnancy rates

Controlled Internal Drug Release (CIDR) Protocol for Estrus Synchronization



Vaginal sponge use in ovine

3 - Vaginal sponges



Method insert vaginal sponge in ewe



Progestogens

2. Synthetic progestogens



- Norgestomet Crestar® (implant)
- Medroxyacetate progesterone (MAP) Inject
- Melengestrol acetate (MGA) (oral)



MGA

- Feed additive to control estrus
- Feed at .5mg/hd/d for 14 days
- Inject with GnRH 12 days after last feeding of MGA
- Inject with PGF₂α 7 days later
- Used mainly for heifers in the feedlot

MGA-PG

MGA (14 days)

1

14

PG



33

MGA Select

MGA (14 days)

1

14

GnRH



26

PG



33

Treatment days

Wood et al., 2001



2 - Prostaglandins

- Prostaglandins
 - Ceases function of the corpus luteum
 - Must have functional corpus luteum
 - No effect on developing CL before 5 days of age
 - No effect on CL after about 16 days of age

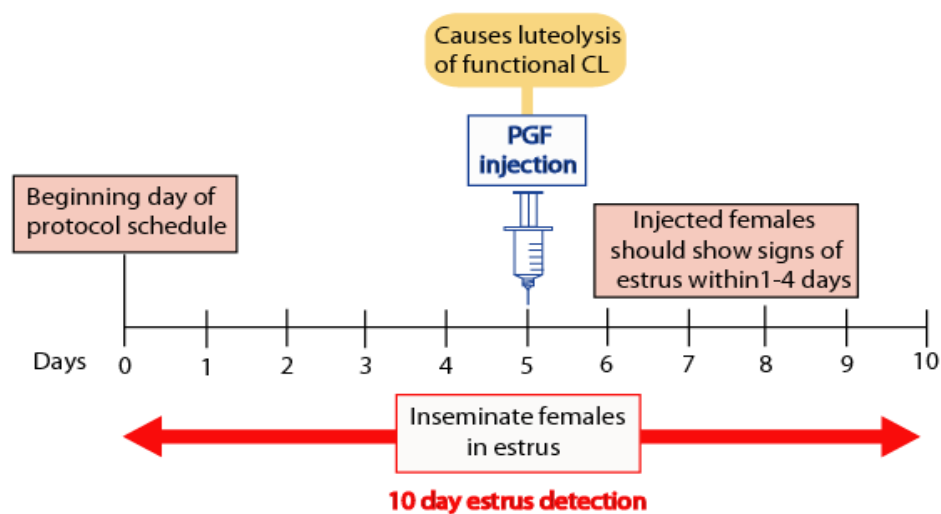
PGF_{2α}

- Natural PGF_{2α}
 - Dinoprost tromethamine (Lutalyse®)
- Synthetic analogue
 - Cloprostenol sodium Estrumate®
 - Luprostinol Prosolvin®
 - Etiproston tromethamine Prostavet®

Prostaglandins

- Naturally occurring hormone that causes regression of the CL (luteolysis) and decreases progesterone secretion which results in a return to estrus
- Can expect estrus within **two days following injection**
- Protocols include PGF **one- injection** and PGF **two- injection**

Protocol for One Injection of Prostaglandin (PGF)



Females that have been inseminated prior to day 5 should not be administered PGF injection unless abortion is desired.

One Injection of PGF

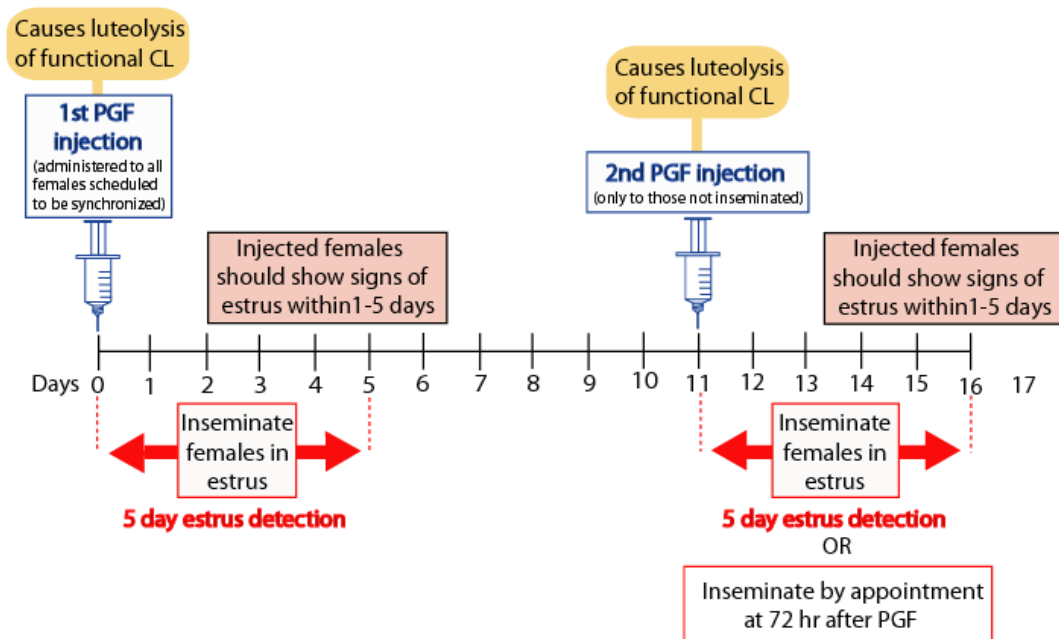
Advantages

- Useful for detection of estrus in heifers and cows
- Decreased drug cost
- Limited animal handling

Limitations

- 10-25% of females may not be detected in estrus
- Poor degree of synchrony on females that return to estrus
- Must have CL
- Length of estrus detection
- Abortion

Protocol for Two Injections of Prostaglandin (PGF) with Split Insemination



Females that have been inseminated prior to day 11 should not be administered PGF injection unless abortion is desired.

Two Injections of PGF

■ Advantages

- Useful for detection of estrus in heifers and cows
- Tighter synchrony than one injection method
- Can use fixed insemination time after 2nd injection

■ Limitations

- Females must have functional CL
- Length of estrus detection
- Administration of PGF will cause abortion in pregnant animals



Synchronization Methods

3 - Gonadotropins(GnRH protocols)

- Naturally occurring hormone that stimulates the release of LH and FSH that stimulates follicular development
- Protocols include Ovsynch and Cosynch

GnRH

- | | |
|---|---|
| <ul style="list-style-type: none">■ Advantages<ul style="list-style-type: none">– Higher and tighter rate of estrus synchrony compared to PGF protocols– Allows for estrus detection or timed AI | <ul style="list-style-type: none">■ Limitations<ul style="list-style-type: none">– Higher cost due to hormone injections– Increase of time and labor |
|---|---|

GnRH agonists

- Hypothalamus hormone
- Release of FSH, LH
- Buselerin (Cystorelin®, Factrel®, Fertagyl®, OvaCyst®)



Sheep and Goats Synchronization

- Ewes estrus (16 days) Does estrus (21 days)
- Progestogen (implant or pessary)
 - Implant 12-14 days sheep
 - Implant 18-21 days goats
 - Inject eCG 400-800 IU at withdrawal
 - TAI ewe at 48-60 hrs and does 30- 48 hrs after progestogen withdrawal
- PGF_{2α}
 - Ewes 2 injection 9 days apart double AI at 2-3 days
 - Does 2 injection 11-12 days apart AI or natural mating at 2-3 days

Synchronization methods: drug trade names and effectiveness

Method	Trade name	Female "type" for drug effectiveness
Prostaglandins	Lutalyse* Estrumate* Prostamate* Equimate [∞]	*Cycling cows or heifers [∞] Cycling mares
Progestins	MGA* CIDR* Regumate [∞]	*Cycling cows or heifers *Anestrous cows or heifers [∞] Mares

* Cattle

[∞]Equine

Synchronization methods: drug trade names and effectiveness

Method	Trade name	Female "Type" for drug effectiveness
Gonadotropin Releasing Hormones	Cystorelin* Fertagyl* Ovuplant [∞]	*Postpartum cows *Anestrous cows [∞] Cycling mares

* Cattle

[∞]Equine