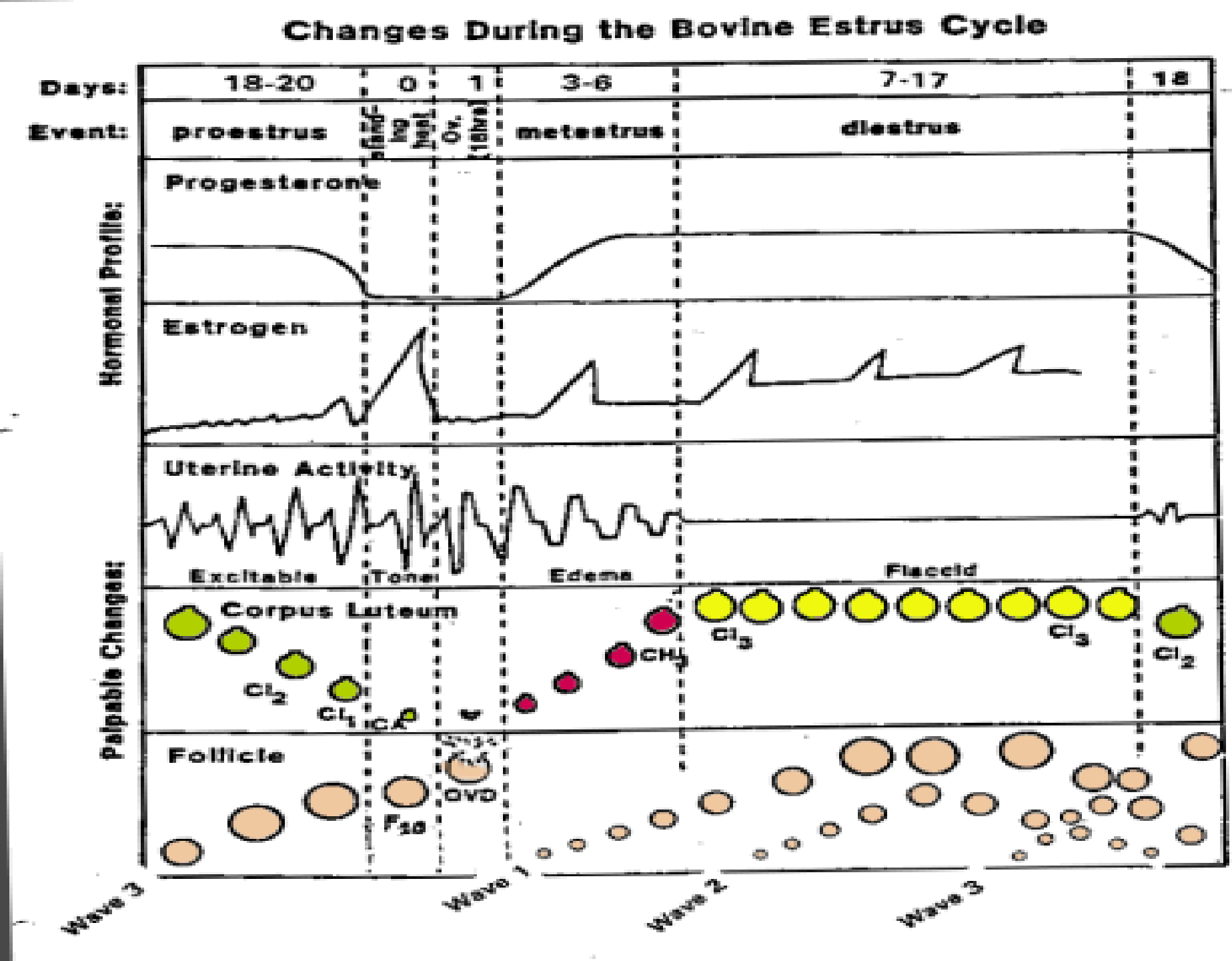
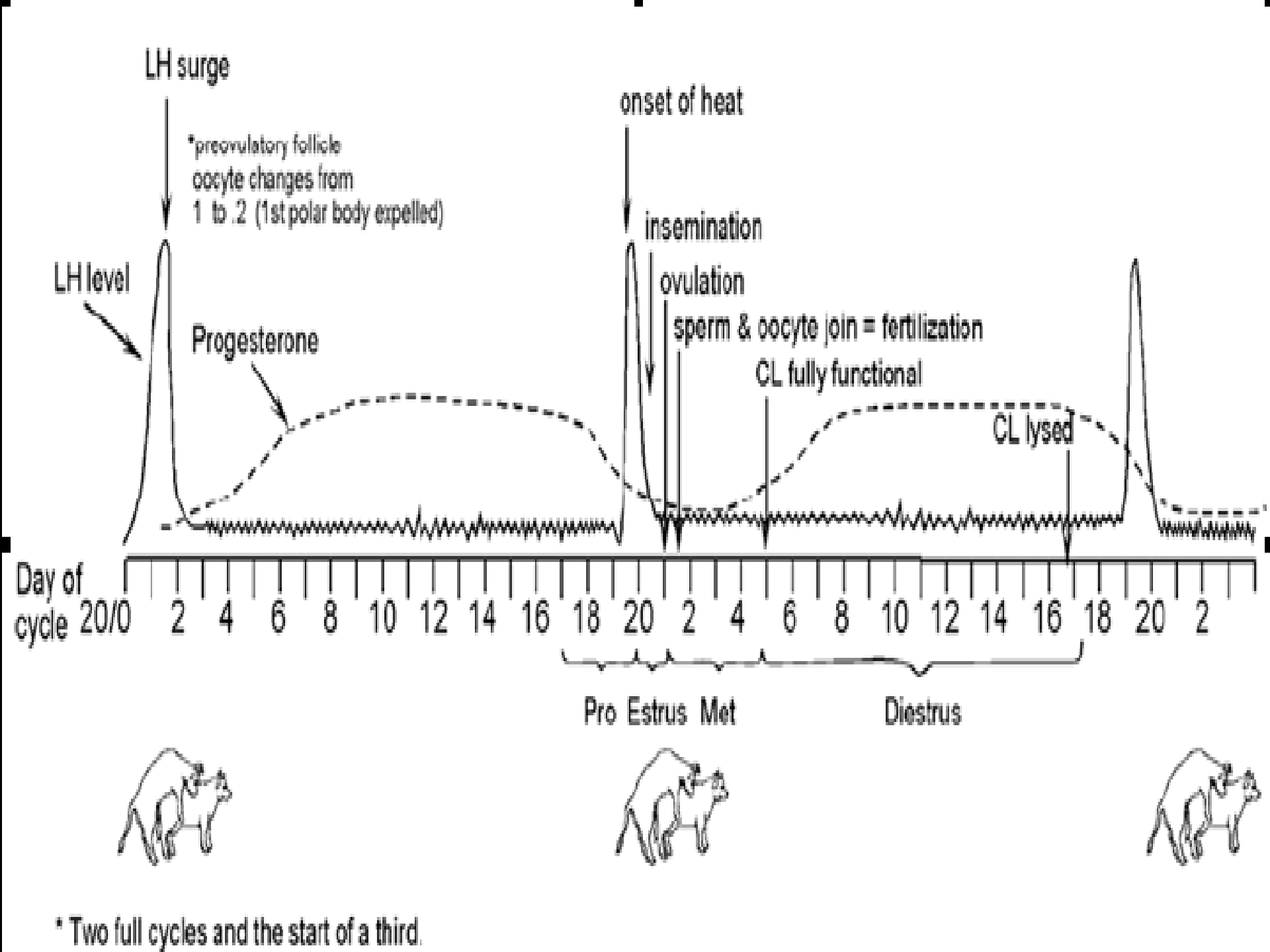
Estrus synchronization

Why

- Group females for parturition:
  - Labor, Calving period
  - More uniform weaning weights.
- Reduce time required for estrus detection.
- Eliminate estrus detection with timed insemination


Changes During the Bovine Estrus Cycle
Days:
18-20
0
1
3-6
7-17
18
Event:
proestrus
metestrus
diestrus
Hormonal Profile:
Progesterone
Estrogen
Uterine Activity
Palpable Changes:
Excitable
Tone
Edema
Flaccid
Corpus Luteum
Follicle
Wave 3
Wave 1
Wave 2
Wave 3



* Two full cycles and the start of a third.

Methods of estrus synchronization

- **Two basic methods to synchronize estrus:**

1. The first: is to kill the corpus luteum that is present with exogenous prostaglandin so the cow comes into heat.

2. The second: is to create an artificial luteal period with progestagens, then abruptly remove the progestagen and allow the cow to come into heat. Prostaglandins 'kill' the corpus luteum and allow a follicle to grow, while progestagens create the artificial luteal period.

Protocol of estrus synchronization

- Synchronization of fertile estrus in heifer can be accomplished with:
  - Progestens
  - Combination of progestens and prostaglandins f2α
  - Prostaglandins f2α alone
  - Combination of gonadotrophins releasing hormones and prostaglandin f2α

Use of progestens or progesterone (synthetic analogues)

- In non-pregnant female during estrous cycle, the onset of the follicular phase leading to estrus & ovulation, is triggered by removal of the negative feedback effects of progesterone on hypothalamus. This normally occurs when CL of the current cycle regresses.

- If animals at any stage of non-pregnant cycles are treated with exogenous progestins for sufficiently long periods of time, they will all go through luteal regression, but will not initiate new follicular phases (high progesterone inhibits GNRH & LH pulses).

- Estrus will not occur as long as progesterone is present. When the progestin treatment is withdrawn, all animals begin their follicular phases in reasonable synchrony & will then come into estrus & ovulate within a narrow span of time

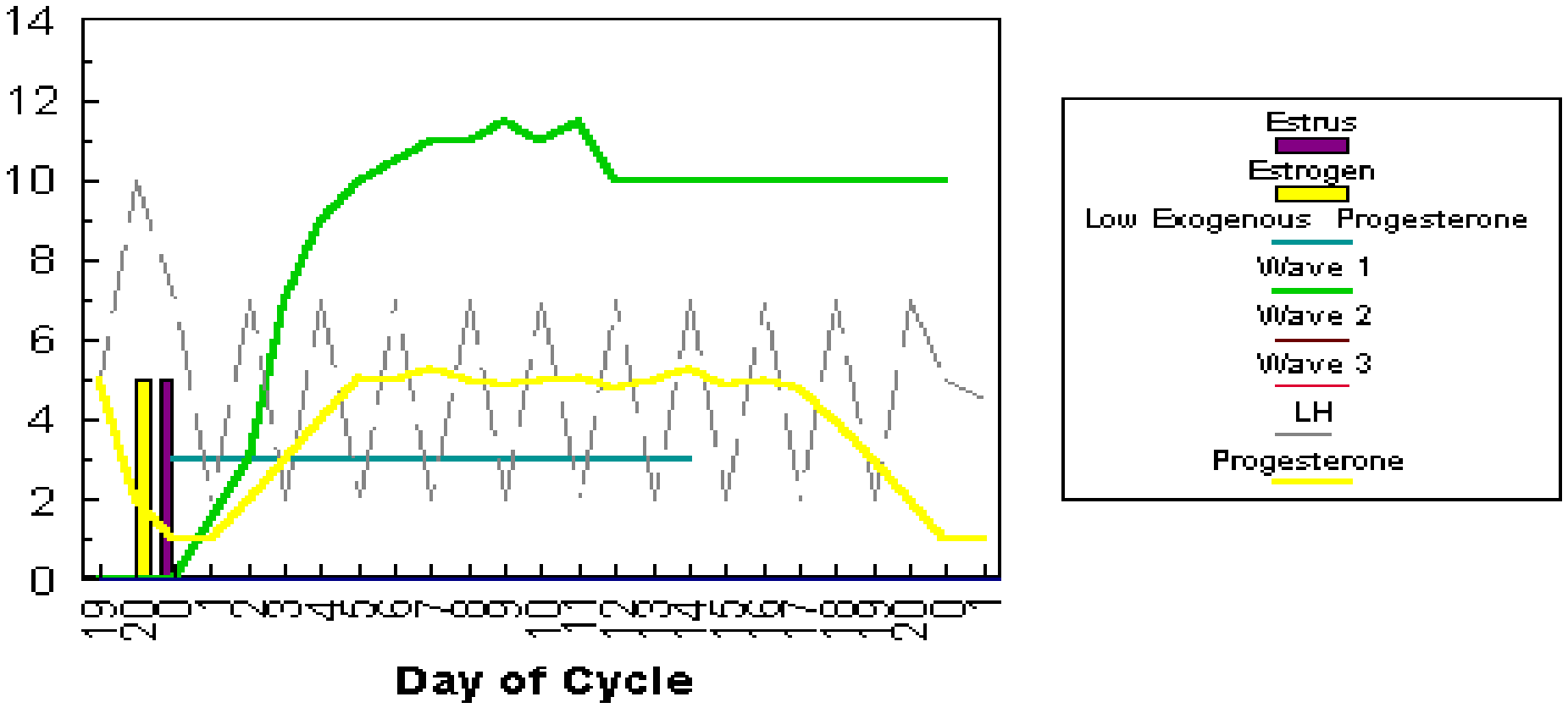
- The early use of long term progestagens (>14 days) such as medroxyprogesterone acetate (MAP), chlormadionone acetate (CAP), & melengestrol acetate (MGA) were very effective at preventing estrus & resulted in a large % of cows coming into estrus after withdrawal, but pregnancy rates were very low.

- This can be made by providing higher doses of progestagens which prevent LH release & therefore allow 'fresh', new follicular waves of follicles to arise.

- Combining a 14 MGA treatment with PGF 17 days after the MGA withdrawal provides a hybrid system where good synchrony is achieved.

- The low fertility of MGA is avoided by having all the cows on days 11-16 of the cycle for the PGF injection.

Bovine Estrous Cycle, Low Dose Progesterone Administration



Low dose progestagen allows an aged wave 1 follicle to ovulate upon progestagen withdrawal.

Shorter term treatments with progestagens combined with luteolytic drugs resulted in good synchrony and better conception rates.

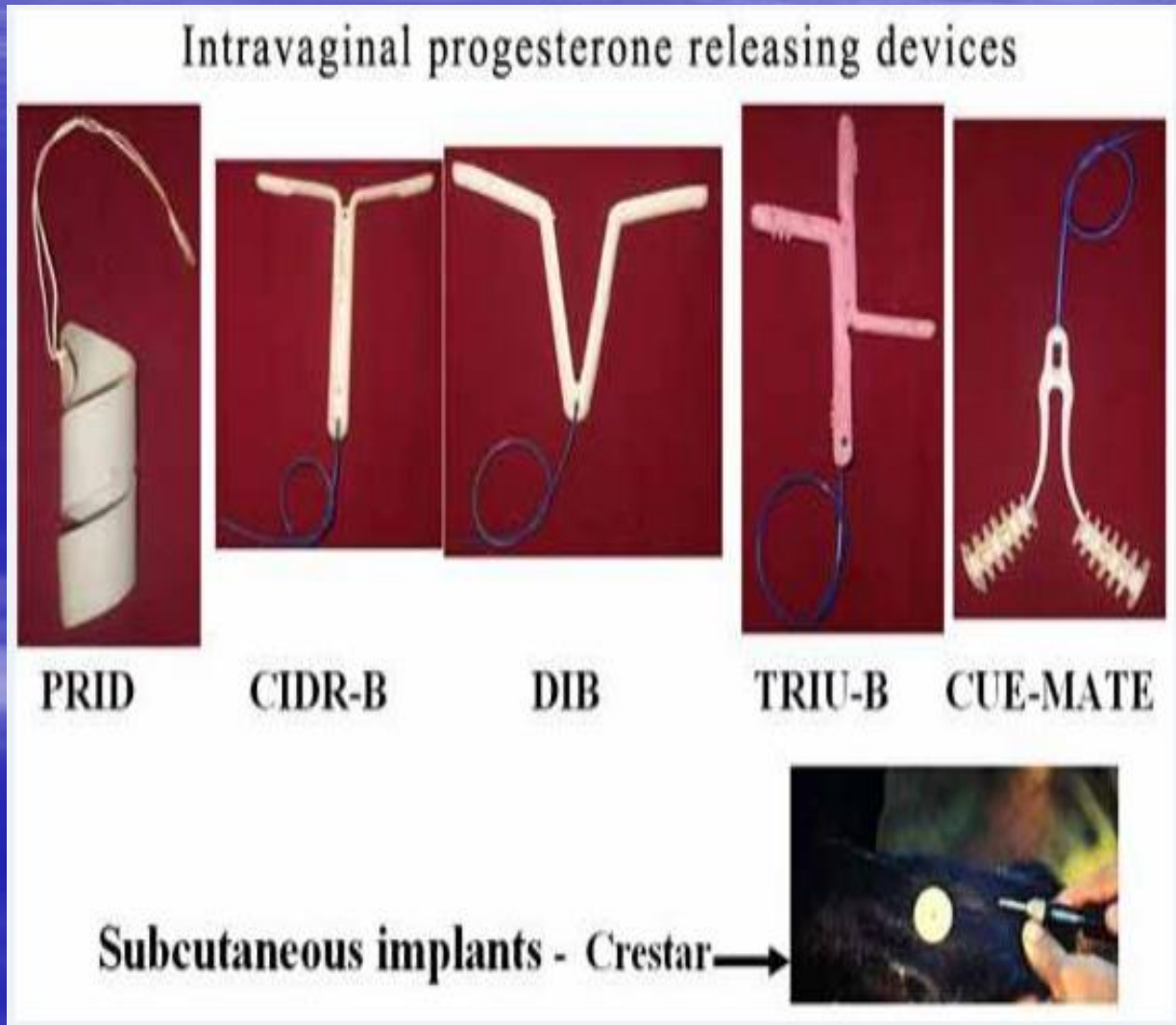
Administration:

1. - Injection

2. - Feed (MGA)

3. - Implant (Synchro-mate B)

4. - Pessary or Control Internal Drug Release (CIDR)



Synchromate B system(CRESTAR in Europe)

Day 1

Inject 5 mg estradiol valerate & 3 mg norgestomet

Implant Norgestomet (Progestagen) 6 mg

Remove implant 9 days later.

Breed 48 to 60 hours later or 54 hours later.

Estradiol - Luteolytic to d 3-9 corpora lutea.

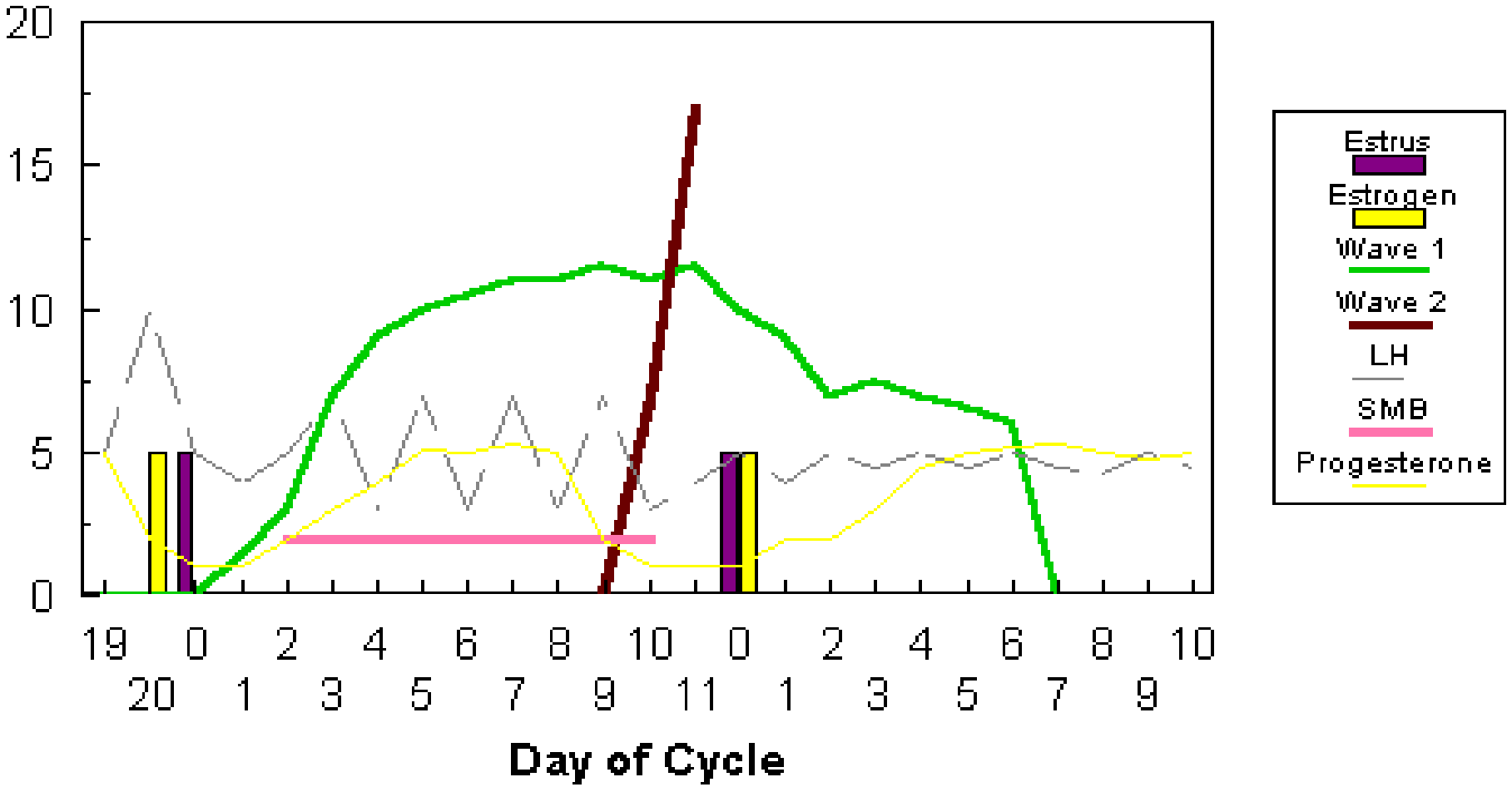
Norgestomet - Inhibits early C.L. development.

If the treatments started late in the estrous cycle, conception is low due to the presence of a dominant follicle. This dominant follicle persisted, aged, & ovulated an old oocyte when the progestagen was withdrawn.

Persistence of the follicle was allowed by the lower doses of progestagens not preventing the LH release.

With normal LH release, new follicular waves are prevented from arising.

Early Estrous Cycle SMB Administration



Melengesterol Acetate (MGA) System

- Feed progestogen for 7 days
- Give PGF2a on Day 8 to regress CL's
- Remove progestogen on Day 9
  Cows are in heat in 2-5 days

MGA + Lutalyse for Synchronization

Advantage and Disadvantage: Must be feeding the animals grain!!

CIDR(controlled intravaginal drug releaser)

- is a T-shaped device that's impregnated with progesterone. Placed in the animal's vagina, the CIDR Insert continually releases progesterone. Removing the insert & the corresponding injection of Lutalyse Sterile Solution (dinoprost tromethamine) causes a drop in progesterone, which triggers estrus & ovulation.

Day 0	Day 6	Day 7	Day 8 - 11
 Administer the EAZI-BREED™ CIDR® Cattle Insert	 Inject 5 mL LUTALYSE® Sterile Solution (dinoprost tromethamine)	 Remove the EAZI-BREED™ CIDR® Cattle Insert	 Heat detect and breed on detected estrus

EAZI-BREED CIDR

Beef Cow

Day 6 | Day 7 | Day 8 | Day 9-11

7 Days

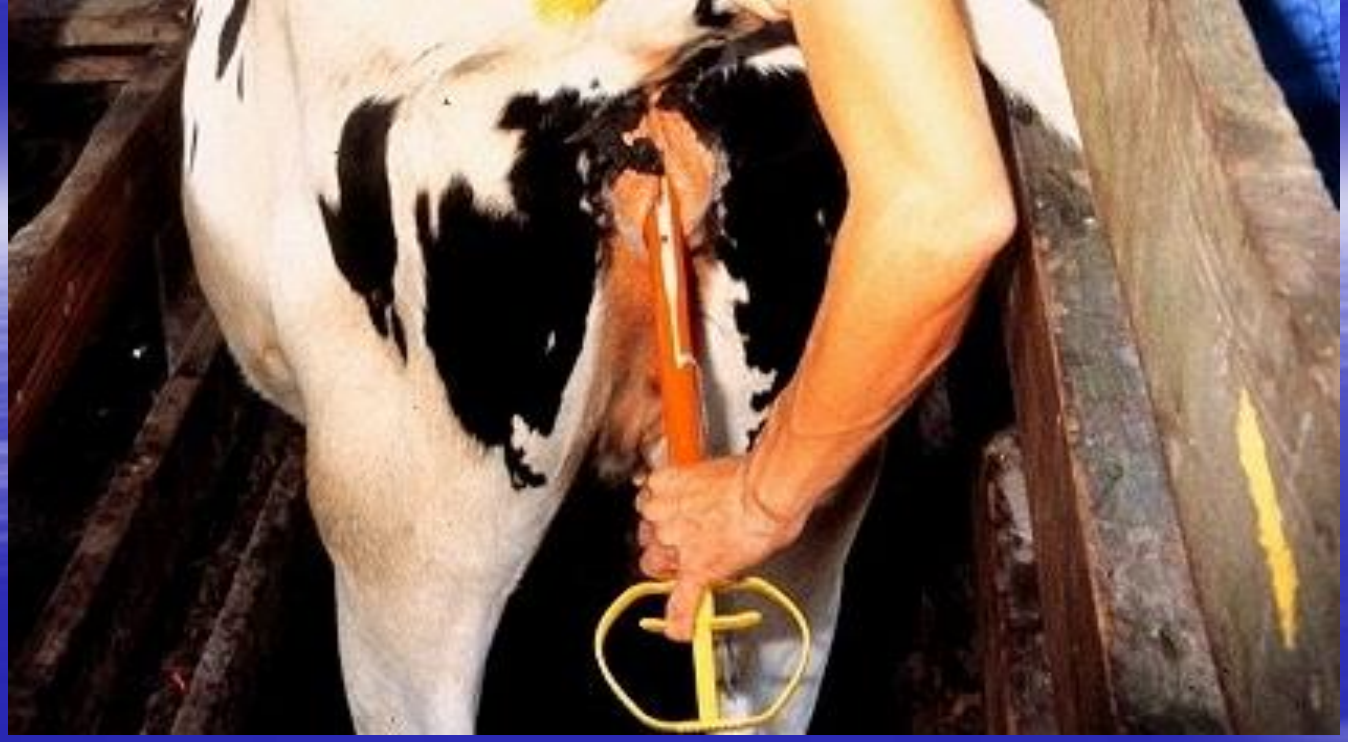
Insert CIDR with CIDIROL capsule

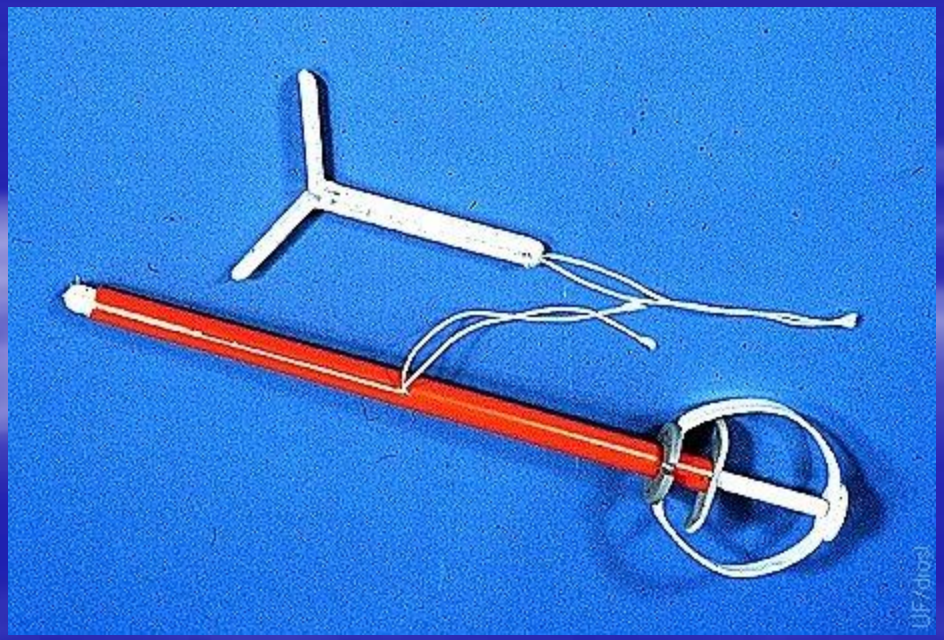
Inject PG

Remove CIDR

Inject 2mL CIDIROL

Detect Estrus or Inseminate Fixed-time 50 hours





EAZI-BREED CIDR System
Insert CIDR (progestin) with CIDIROL capsule (estrogen) in vagina
Day 6 inject with PGF2a
Remove CIDR Day 7 and breed on heat detection

Ewe estrus synchronization:

- Implant progestogen for 12-14 days
- Remove implant, ewes in heat in 36-60 hours
- May use eCG at implant removal to stimulate follicular growth

Mare estrus synchronization:

- **Use of progestins in horses**
  - **Regumate**
    - **.044 mg/Kg body weight in feed**
    - **Feed for 12 days**
    - **Remove from feed; give equimate**
    - **In heat 3-4 days later**


THANK YOU....!