



College of Veterinary Medicine
Department of Surgery & Theriogenology



Estrous Synchronization In Cows

Dr. Isam Bahnnan Basheer

Dr. Isam Bahnnan Basheer



College of Veterinary Medicine

Department of Surgery & Theriogenology



Definition

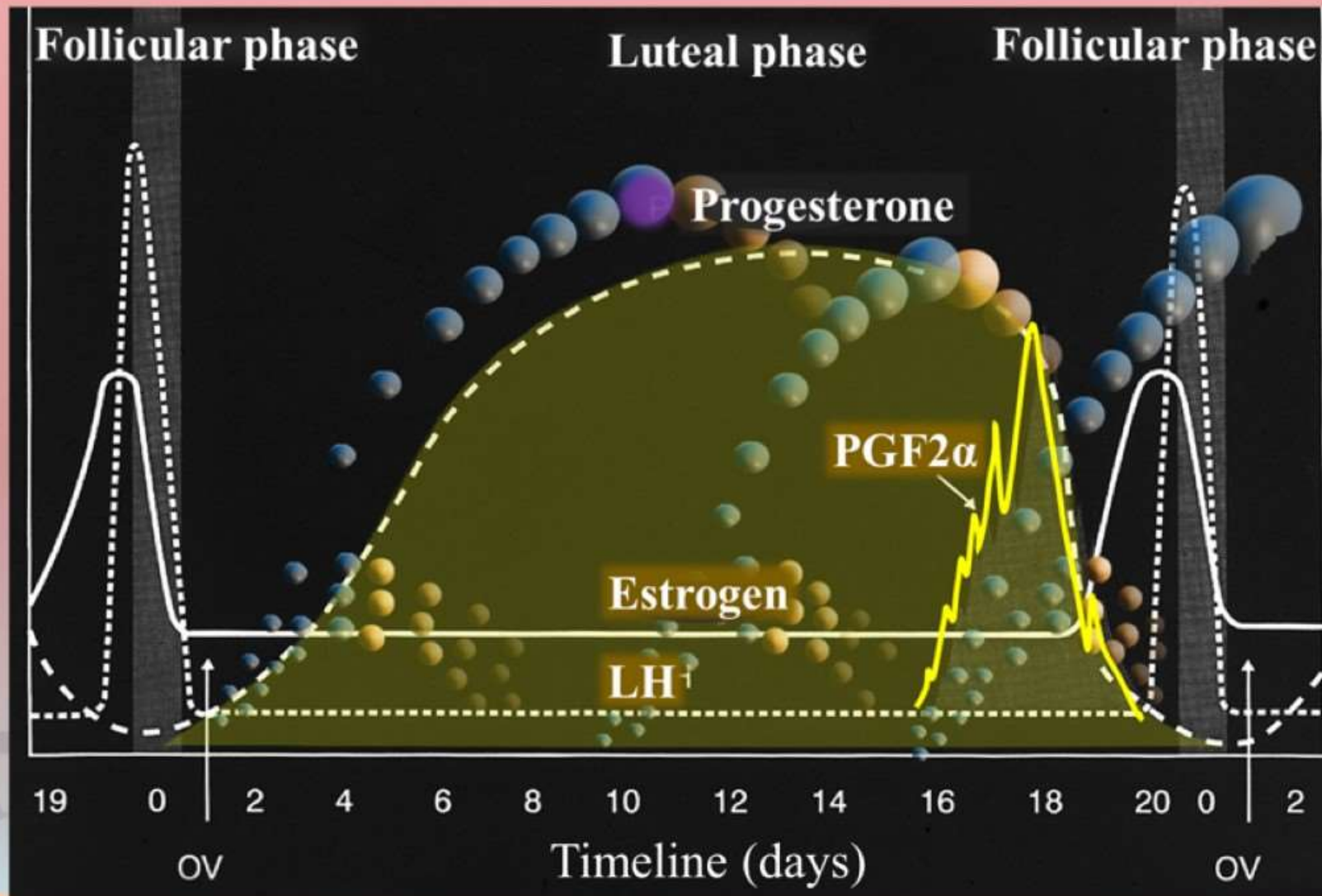
Is the manipulation of the estrous cycle or induction of estrus in a group of females so that it can be bred or artificially inseminating with normal fertility in a short predetermined time.

Dr. Isam Balmashri



College of Veterinary Medicine

Department of Surgery & Theriogenology



Hormonal control and Follicular waves during estrus



College of Veterinary Medicine

Department of Surgery & Theriogenology



Advantages

- To achieve pregnancy in a group of females at the desired period.
- Reduce the variation in calving intervals among cows.
- Uniformity of calves at weaning.
- To reduce the difficulties of heat detection and artificial insemination.
- To get the calves at desired season for better management.
- To produce the high amount of milk at a certain time.
- It is required at the process of embryo transfer.



College of Veterinary Medicine

Department of Surgery & Theriogenology



Difficulties

- Medication and technical expenses.
- A high level of management and good handling facilities are required.
- Cows must be cycling and in a good body condition.
- Natural or artificial insemination is required at a limited time.
- Not all females might response to the treatment.

Hormones used for estrus synchronization



Prostaglandin

Lutalyse®, Estrumate®,
ProstaMate®, In Sync®

Regression of the
corpus luteum

Cycling females



Progesterone

Melengestrol acetate
MGA®), Intravaginal
Progesterone Releasing
Insert (CIDR®)

Suppression of the
ovarian activity

Prepubertal heifers

Post-partum or Anestrous females



GnRH

Cystorelin®, Factrel®,
Fertagyl®, OvaCyst®

Follicle growth and
ovulation

Mature females



College of Veterinary Medicine

Department of Surgery & Theriogenology



I. Prostaglandin F₂α (PGF₂α)

- PGF₂α is only effective in the presence of **active CL** (day 7 -17).
- It is a practical method in both **cyclic females and virgin heifers**.
- Not effective in **postpartum anestrus cows** (>80 days) and **prepubertal heifers** (>12-15 months of age), since no CL exists.
- Females with a mature CL **exhibit heat 2-5 days** after injection of PGF₂α.
- PGF₂α causes **regression of the CL (luteolysis)** and decreases progesterone secretion which results in a return to estrus
- Administration of PGF₂α **causes abortion** in pregnant animals.

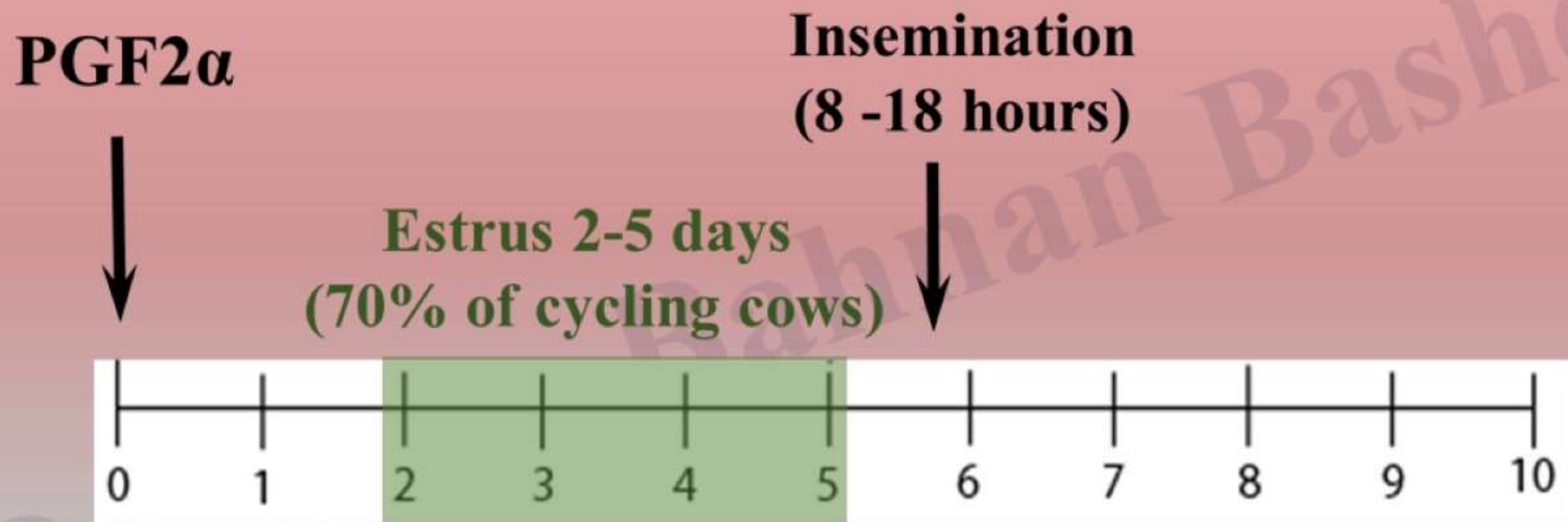


College of Veterinary Medicine

Department of Surgery & Theriogenology



I.1. Single injection of PGF2 α system



For example, if 100 females are injected, and only 50 are cyclic, the estrus response would be 35% (70% of 50 cyclic females/100 females injected).



College of Veterinary Medicine

Department of Surgery & Theriogenology



I.2. Double injection of PGF2 α

1st PGF2 α

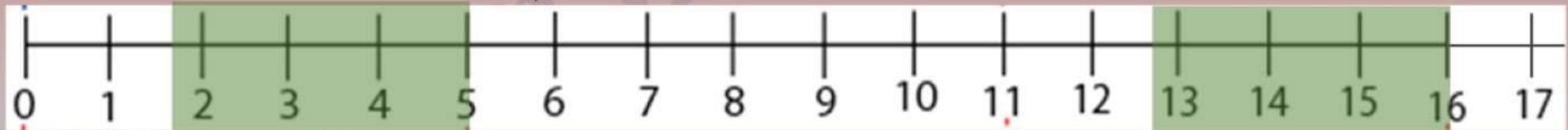
Insemination
(12 -18 hours)

2nd PGF2 α

Insemination
(12-18 hours)

Estrus detection
(70% of cycling cows)

Estrus detection

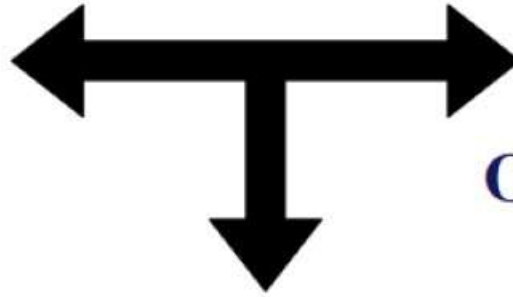


Days

II. Progesterone



Intravaginal insertion



Orally in feed



Ear implant

Maintains **high levels of progesterone** in the female's system even after the regression of the corpus luteum



Causes a **-Ve feedback** on hypothalamus (block FSH and LH functions)



Prevents **estrus and ovulation**





College of Veterinary Medicine Department of Surgery & Theriogenology



II. 1. MGA+ PGF2 α protocol

Estrus occurs 2-5 days, but females should not be inseminated due to low conception rate.

Suppression of the
ovarian activity



PGF2 α

MGA is given orally in feed
(0.5mg/head/day) for 14d

Discontinue feeding 19 days
Do not inseminate estrum cows

Estrus
2-5 days
A.I

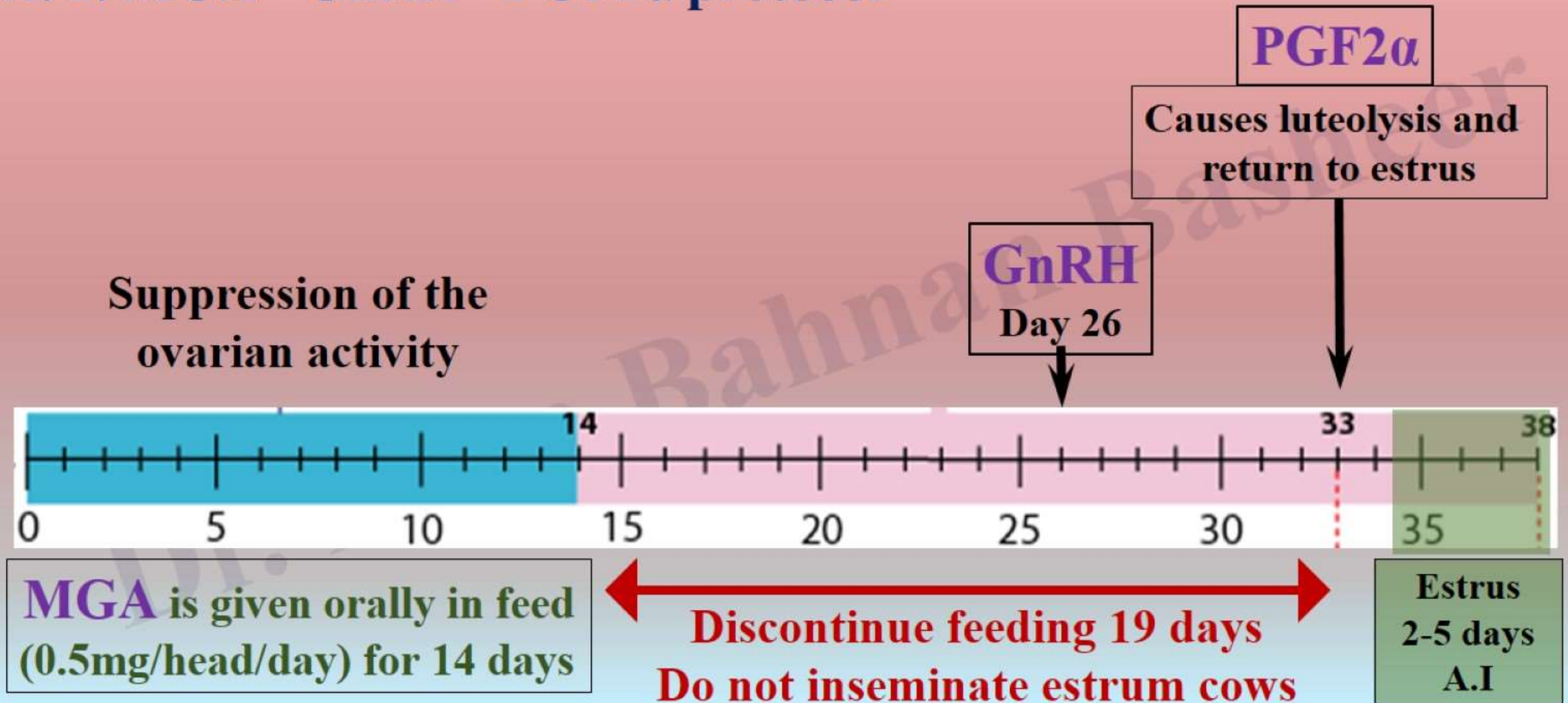


College of Veterinary Medicine

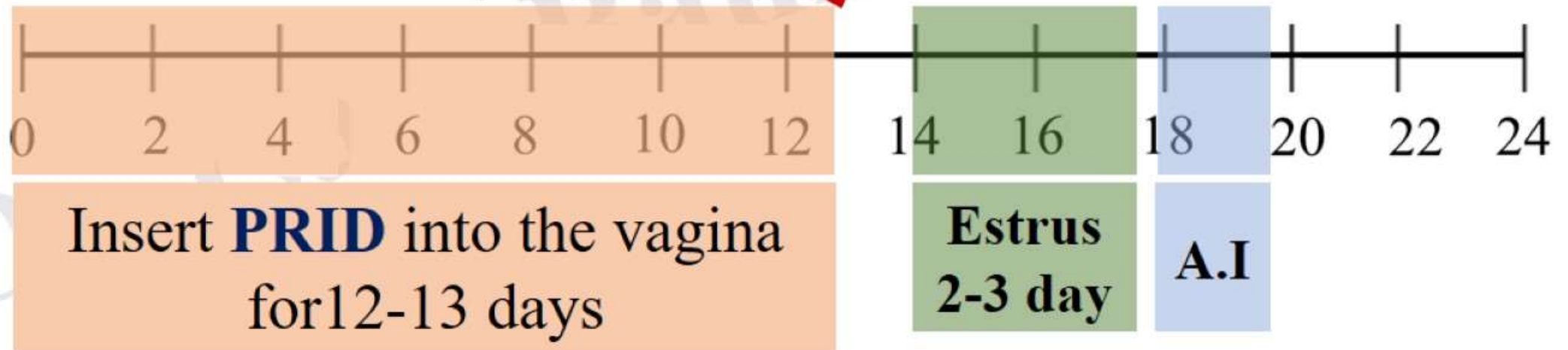
Department of Surgery & Theriogenology



II. 2. MGA+ GnRH+ PGF2 α protocol



II. 3. Progesterone-releasing intravaginal device (PRID) a(containing 1.55g progesterone)





College of Veterinary Medicine

Department of Surgery & Theriogenology



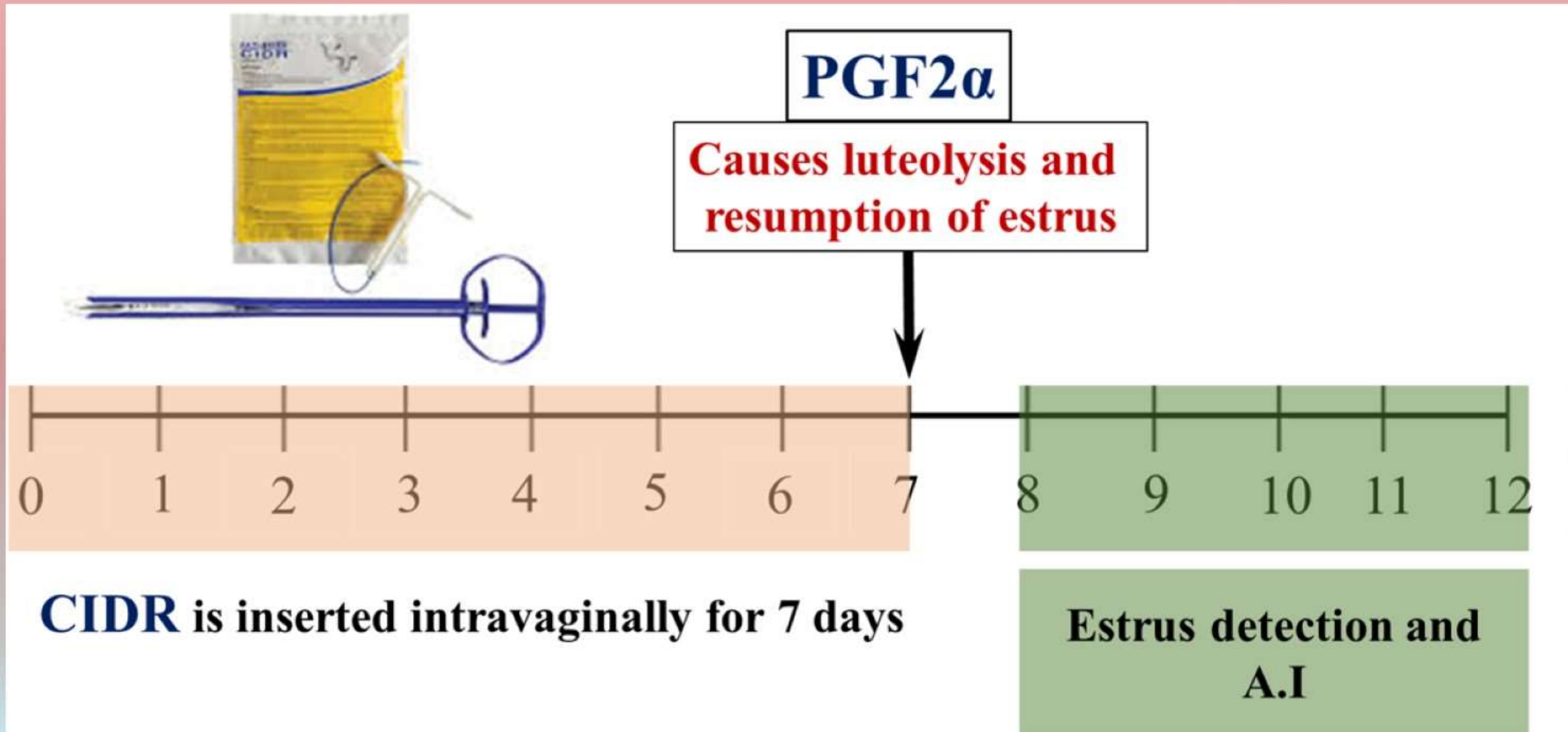
II. 4. Controlled internal drug release CIDR® + PGF2 α

- Wear protective gloves whenever handling the CIDR Insert .
- Wash the applicator with the water and a disinfectant solution .
- Fit CIDR into the applicator with the tail along the slot.
- Apply lubricant to the tip of the insert (CIDR).
- Insert the applicator in the vulva at a slightly upward angle, moving forward until it meets resistance.
- Pushout CIDR from the applicator; then slowly withdraw the applicator.
- To withdraw CIDR seven days later; gently pull the tail of the CIDR.



College of Veterinary Medicine

Department of Surgery & Theriogenology





College of Veterinary Medicine
Department of Surgery & Theriogenology



How to apply CIDR (Video):



https://www.youtube.com/watch?v=f8Lb13B_KdQ

Video title on YouTube: CIDR Handling - Mizzou Repro



College of Veterinary Medicine

Department of Surgery & Theriogenology



III. Gonadotropin-releasing hormone (GnRH)

- A single injection of GnRH at random stages of estrous cycles causes **stimulation of follicle growth and ovulation.**
- Treatment with GnRH is **combined with** PGF2 α .
- Synchrony of estrus and fertility with a combination of GnRH and PGF2 α is practical for **cyclic females and postpartum anestrus.**

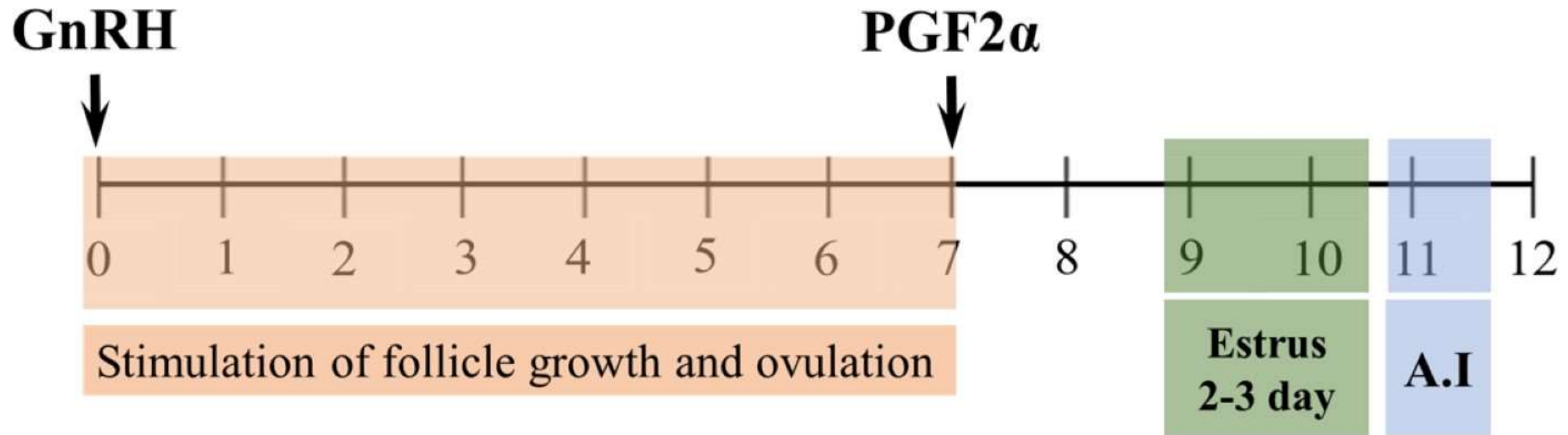


College of Veterinary Medicine

Department of Surgery & Theriogenology



III. 1. Select-Synch protocol



- Some cows will exhibit estrus up to 36 hours before the injection of PGF2 α .
- The peak estrous response will occur two to three days after PGF2 α .

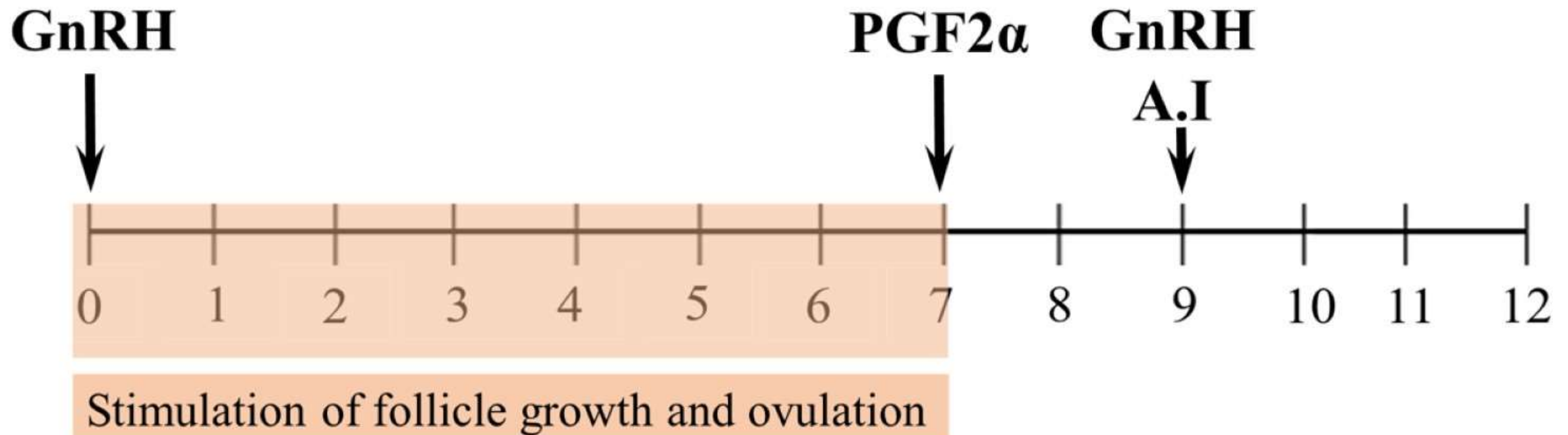


College of Veterinary Medicine

Department of Surgery & Theriogenology



III. 2. Co-Synch protocol



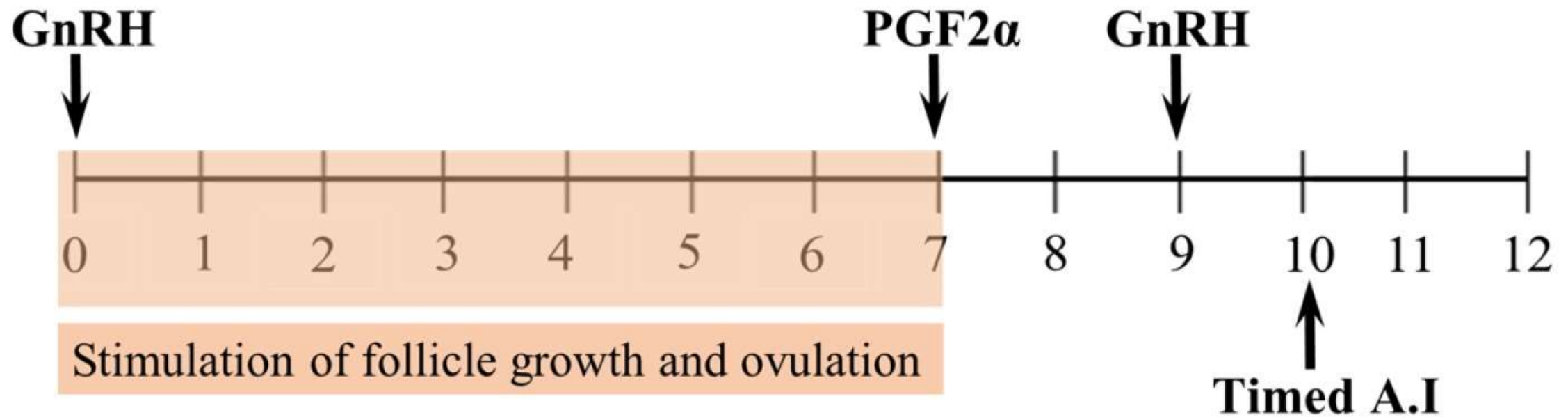


College of Veterinary Medicine

Department of Surgery & Theriogenology



III. 3. Ov-Synch protocol



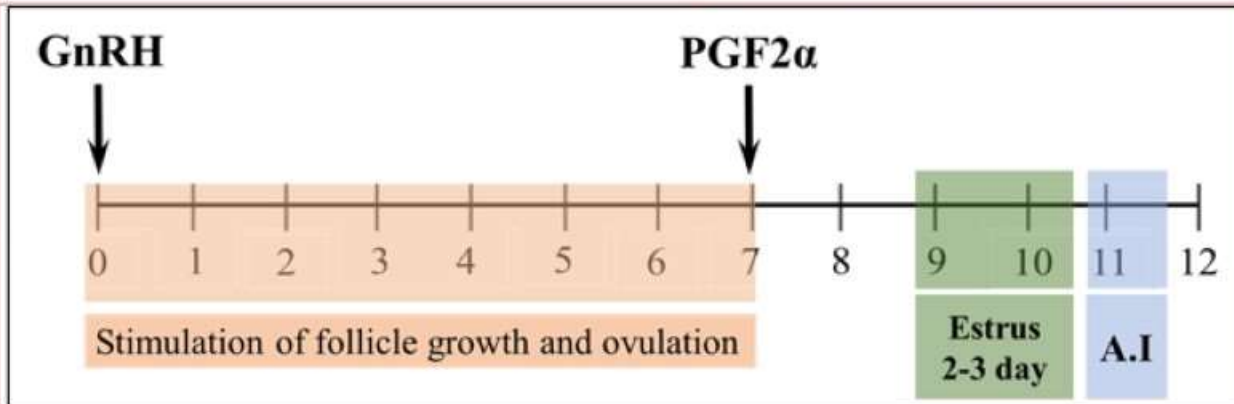


College of Veterinary Medicine

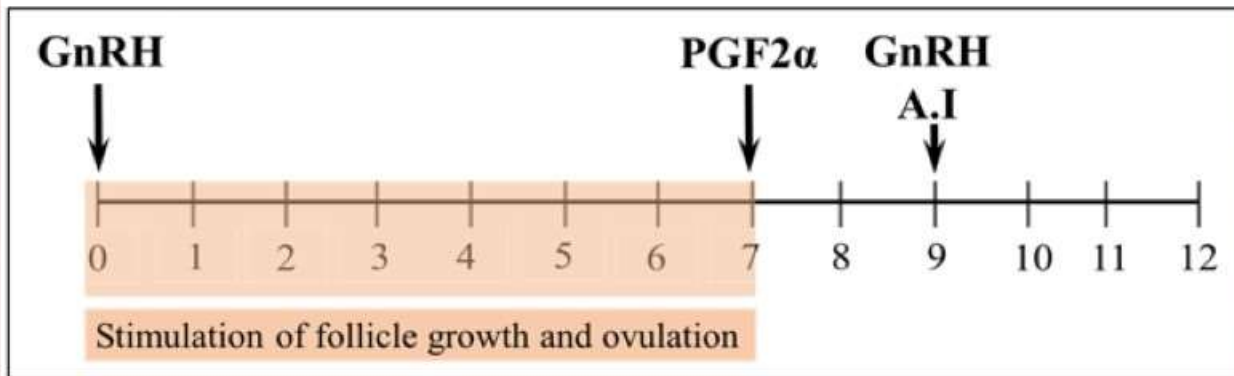
Department of Surgery & Theriogenology



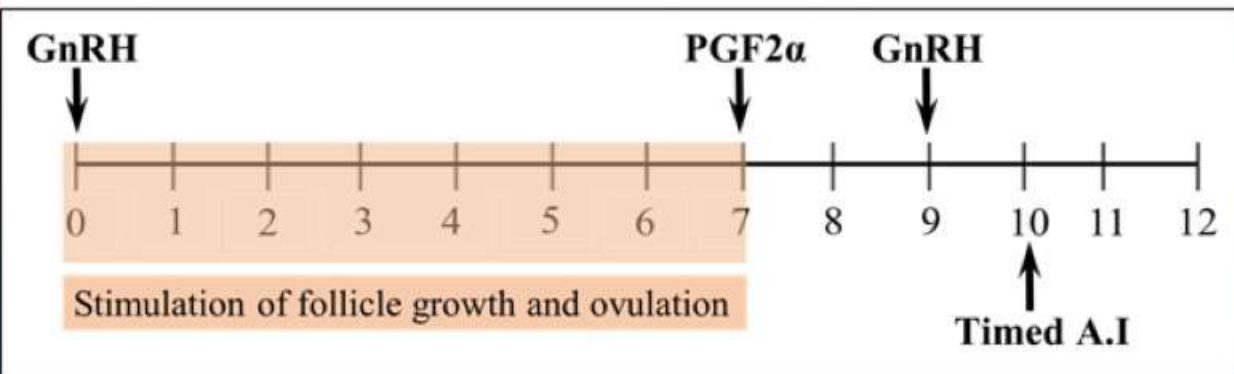
III. 1. Select-Synch protocol



III. 2. Co-Synch protocol



III. 3. Ov-Synch protocol



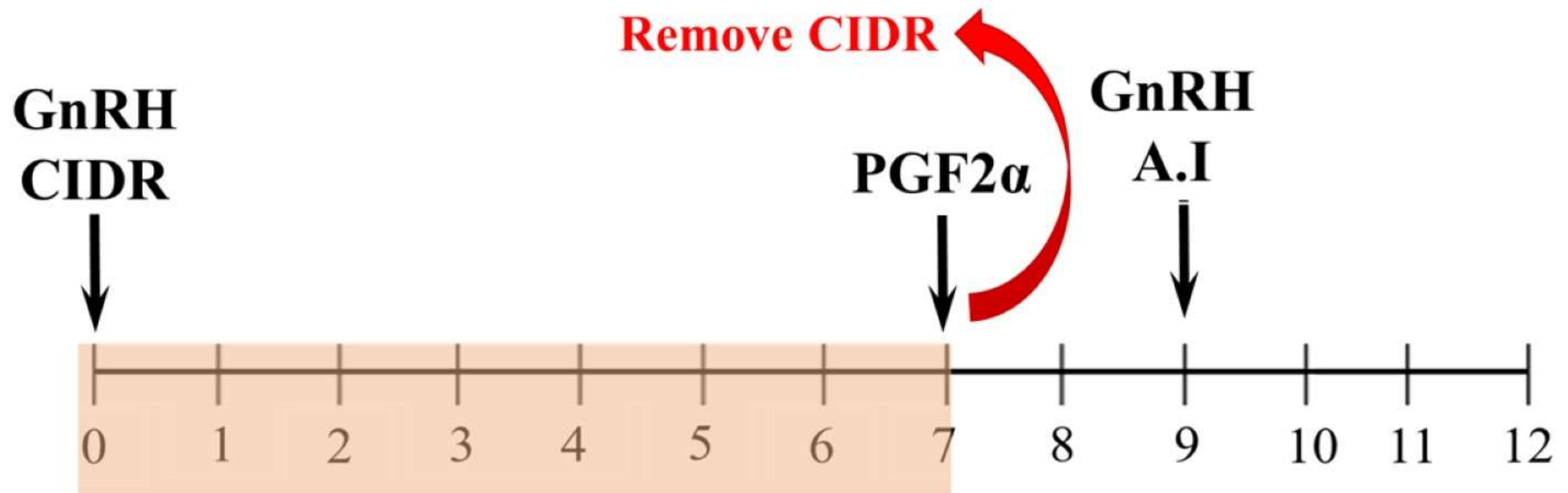


College of Veterinary Medicine

Department of Surgery & Theriogenology



IV. GnRH + CIDR® + PG protocol





College of Veterinary Medicine Department of Surgery & Theriogenology



V. CIDR[®] + PG + GnRH





College of Veterinary Medicine

Department of Surgery & Theriogenology



Management Considerations

- **Have proper facilities to handle animals.**
- **Good reproductive records and cattle must be on good nutritional and herd health programs.**
- **Have enough A.I. technicians (30-50 cows/technician).**
- **Follow label instructions for storage, uses, and shelf life limitations.**
- **Effective heat detection programs must be followed.**
- **Use good fertility semen.**



College of Veterinary Medicine
Department of Surgery & Theriogenology



Thanks for Attention