

# Developing a Successful AI Program

Bob Godfrey, Ph.D.  
Professor – Animal Science  
Assistant Director  
Agricultural Experiment Station  
University of the Virgin Islands  
St. Croix, VI

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# What is assisted reproductive technology?

- Artificial Insemination (AI)
  - Offspring has 50% of genetics of each parent
- Embryo transfer (ET)
  - Offspring has 0% of surrogate genetics
- In vitro fertilization (IVF)
  - Produce embryos for ET
- Cloning
  - Replicate of one parent– asexual reproduction

# Why do we use assisted reproductive technology in livestock?

- Access to variety of genetic material
- Better utilize resources – labor, feed, facilities
- Produce for time specific markets
- Uniform product



# Advantages of using AI

- Shortening the calving interval
  - Allows females (especially heifers) to conceive earlier in the breeding season
- Can use some AI programs to reduce time and labor in detecting estrus (heat)
  - Breed based on estrus or by appointment (timed AI)
- Producing a more uniform calf crop with similar ages
  - Simplifies vaccinating, weaning schedules

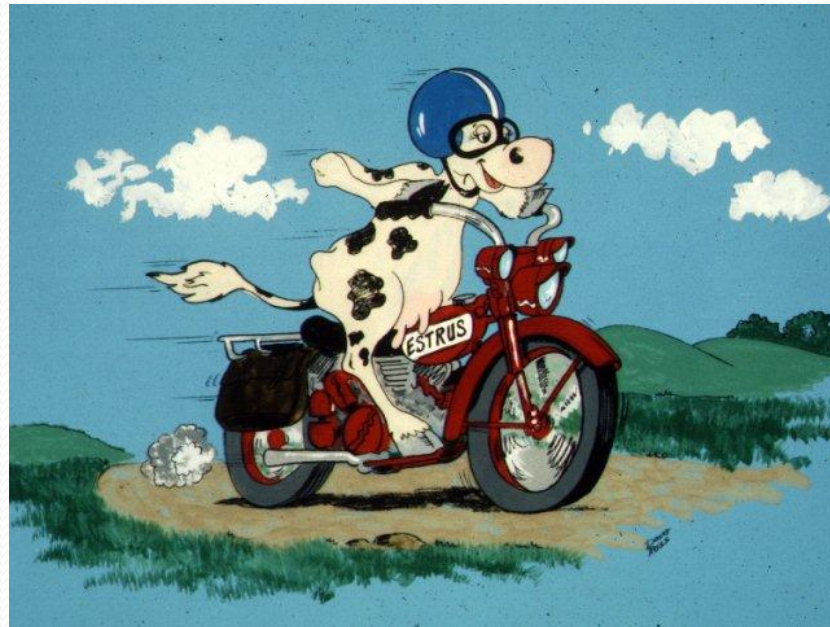


# Requirements for a Successful AI Program

- **Females exhibiting regular estrous cycles**
- Healthy animals that are free from disease and on a good nutrition program
  - Body condition score
- Willingness by producers to learn how to use the product(s) and program
- Working facility with a small crowding corral, a holding alley, and chute
- Provision for added labor needs
- Accurate and thorough detection of estrus
- Females are individually identified and accurate records kept
- Use synchronization products according to label instructions

# Words of Warning

- Estrous synchronization and AI will not substitute for lack of nutrition, herd health or poor herd management
- Females have to be cycling!!



# Detecting Estrus (Heat Checking)

- Visual observation of females
- Best done at dawn and dusk
- Takes time and patience
- Need animal identification system



# What to look for

- Mounting
  - Homosexual or heterosexual
- If animal being mounted stands still then she is in heat
- If animal being mounted does not stand then she is not in heat
- Animal doing the mounting may be in heat



# Aids for heat Checking

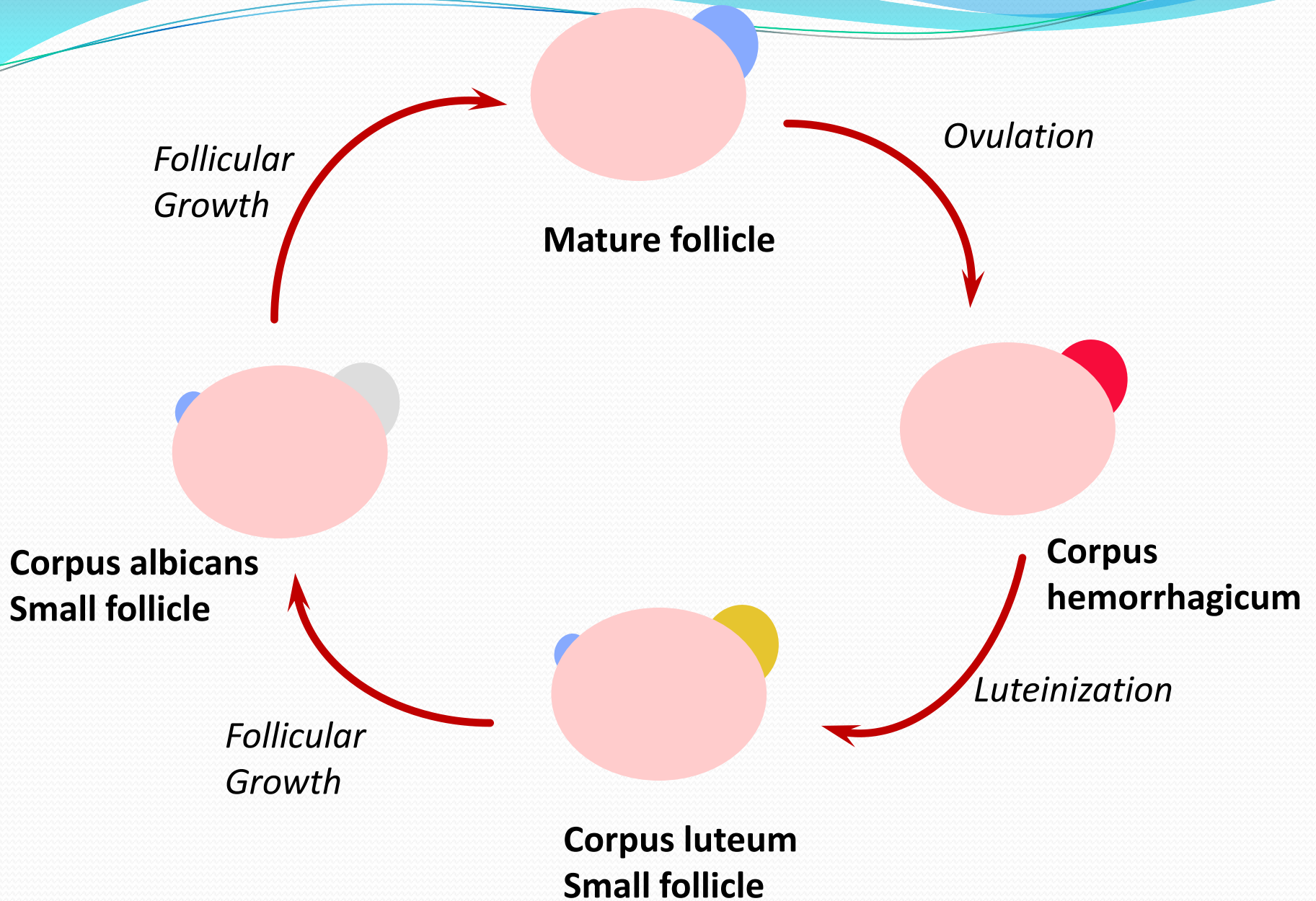
- Sterile bull with chin ball marker
  - Vasectomy or epididymectomy



# Aids for heat Checking

- Patches





# Estrous synchronization treatments

- Prostaglandin analogues – Lutalyse, Estrumate
- Progesterone/Progestins – CIDR, MGA (feed additive)
- Ovulation control– GnRH or hCG (Fertagyl, Cystorelin)

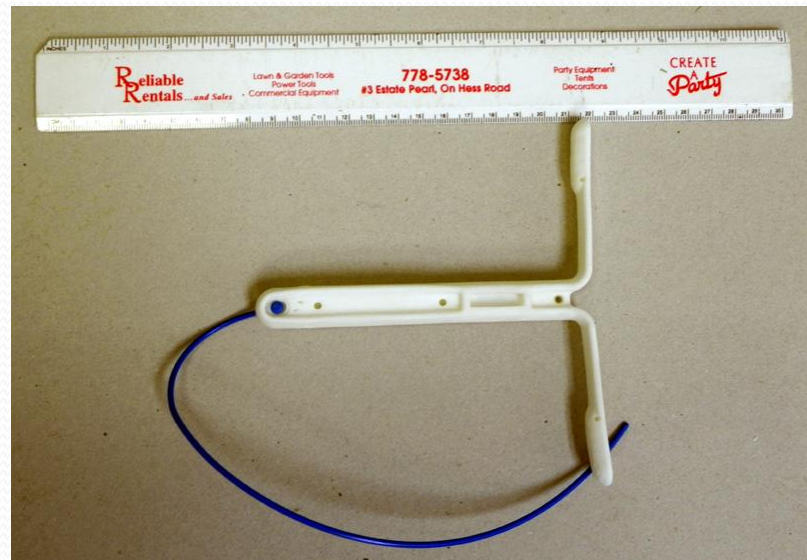
# Prostaglandin analogues

- Only works in cycling females
- Cow must not be pregnant – aborts fetus
- Requires handling animal multiple times



# Progesterone releasing devices

- CIDR – vaginal insert
- Use in cycling females
- Inserted for 7-12 days
- Requires handling animal multiple times



# Gonadotrophins

- hCG, GnRH, PMSG
- Helps to time ovulation
- **DOES NOT** synchronize estrus

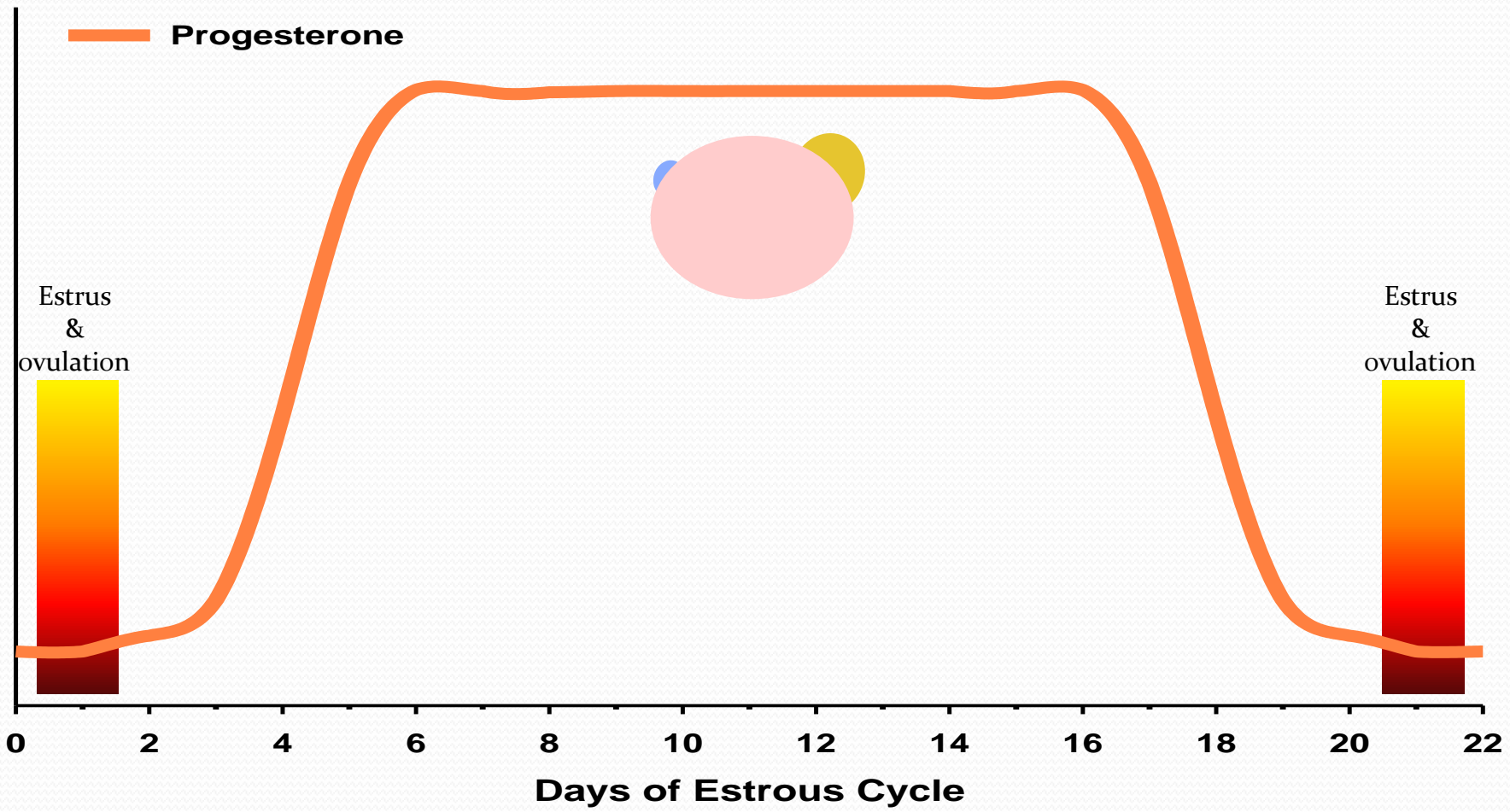


# What is the best synchronization method?

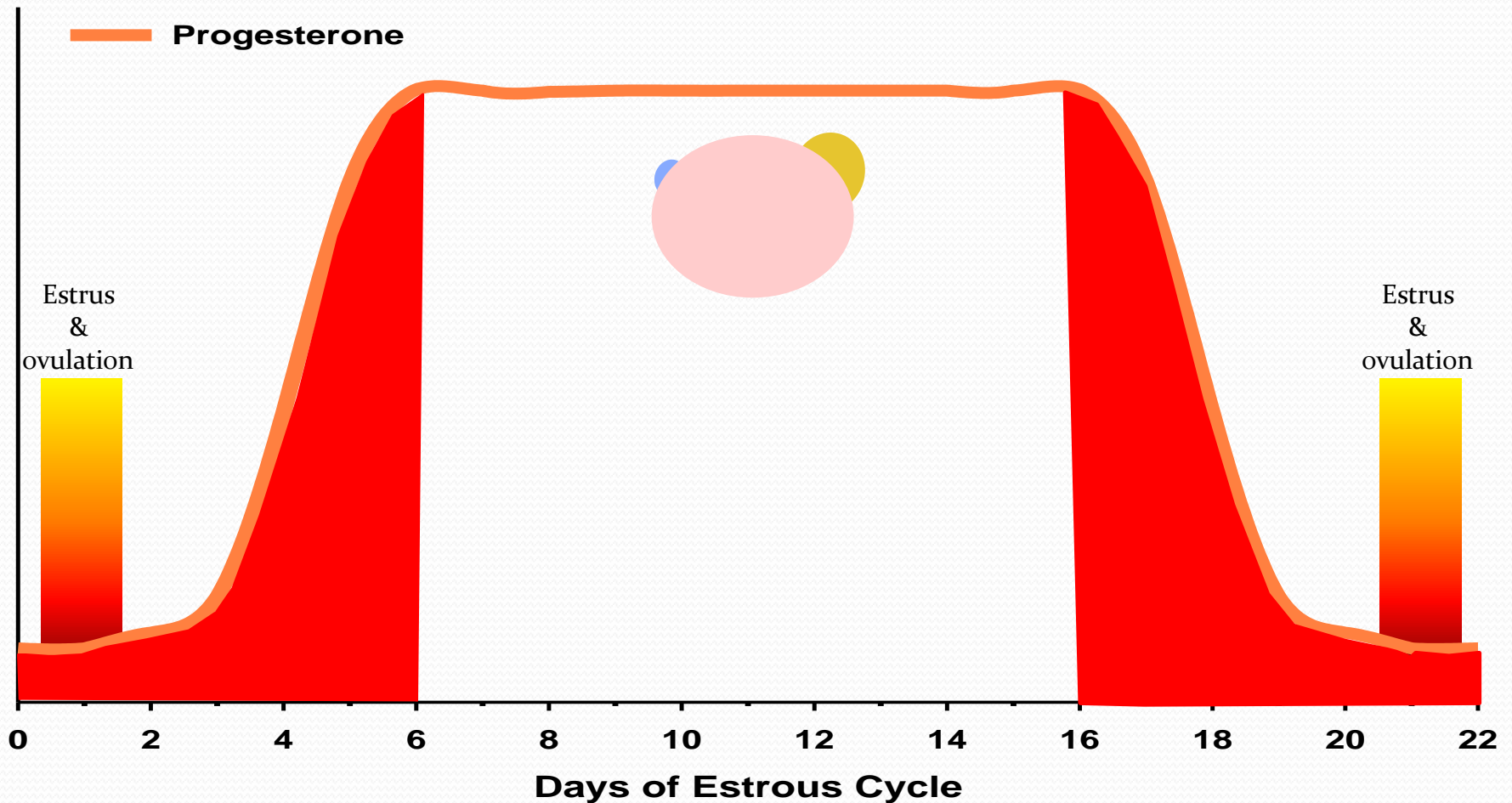
- Costs
  - Per animal
  - Per insemination
- Animal handling
  - How many times do the cattle have to come through the chute?
- Heat checking vs. Timed AI (TAI)
  - Labor
  - Skill
- Breed differences in response to treatment
  - *Bos indicus* vs. *Bos taurus*
- Age of animals
  - Heifers vs. Cows



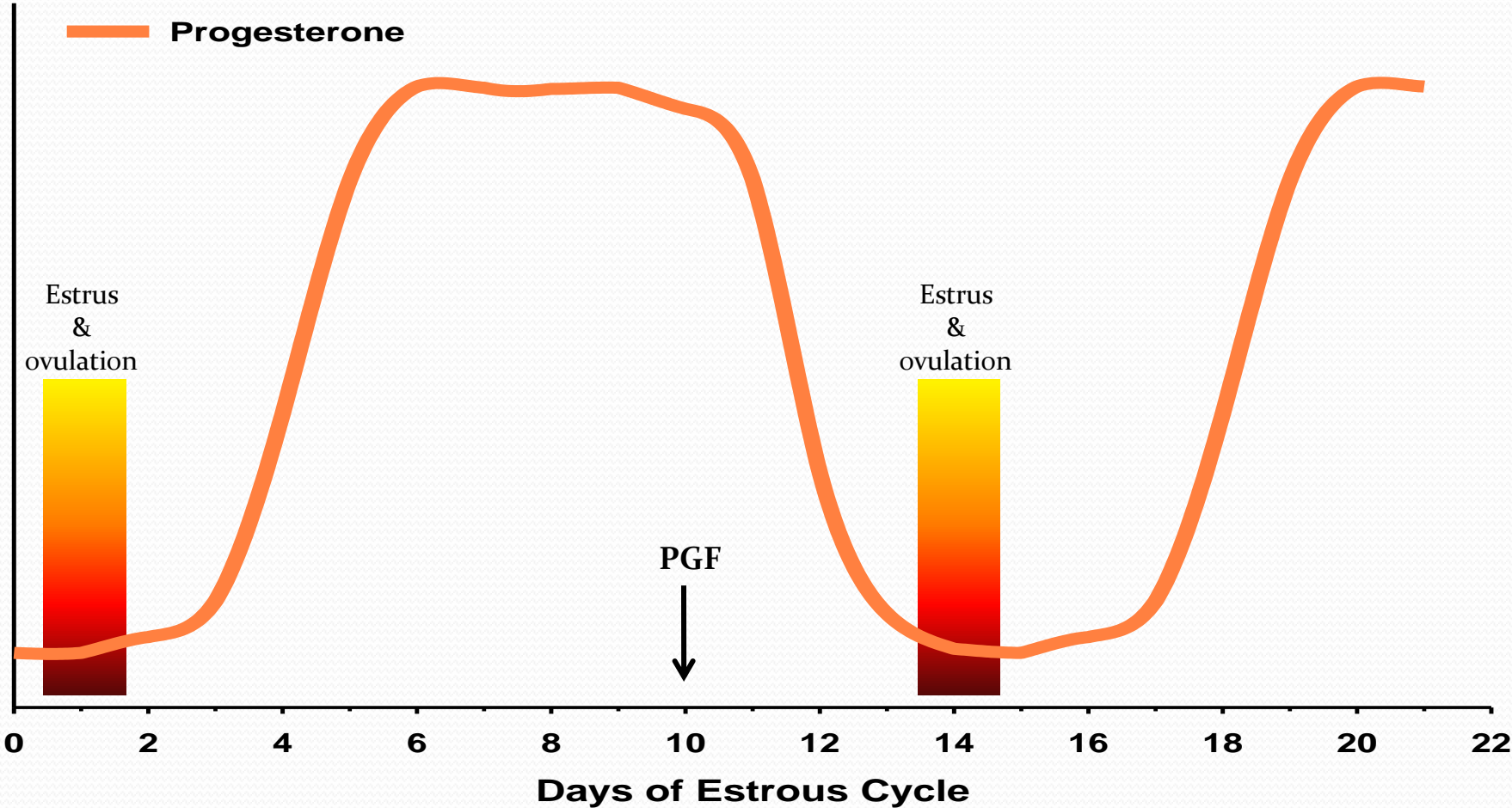
# Progesterone profile during estrous cycle of the cow



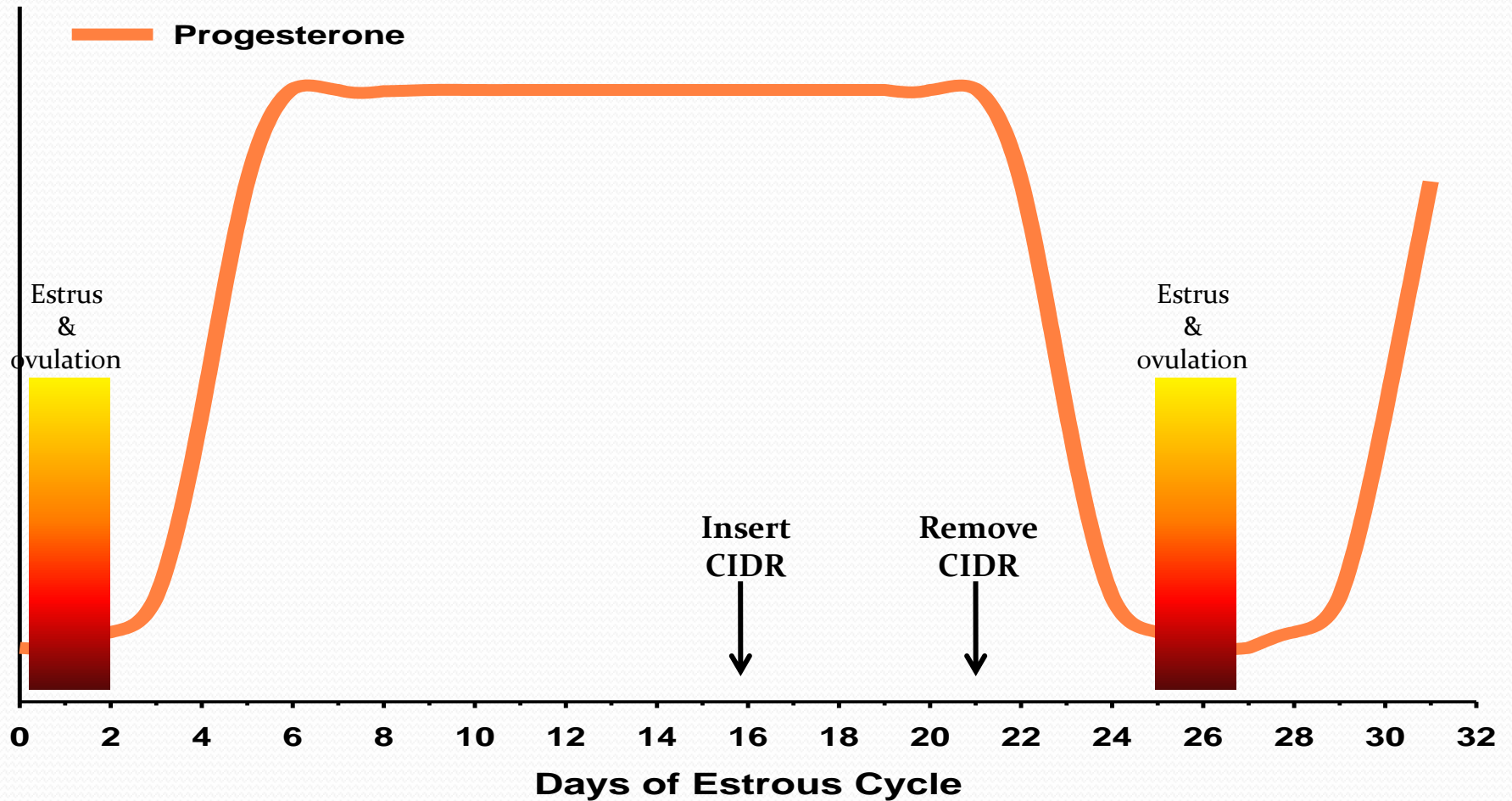
# Period during the estrous cycle when the CL is sensitive to prostaglandin



# Use of prostaglandin to synchronize estrus

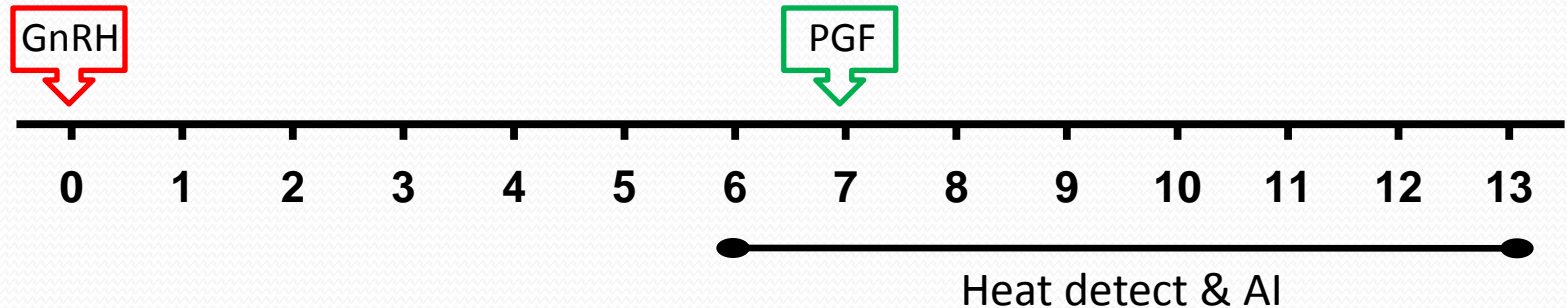


# Use of progestins to synchronize estrus



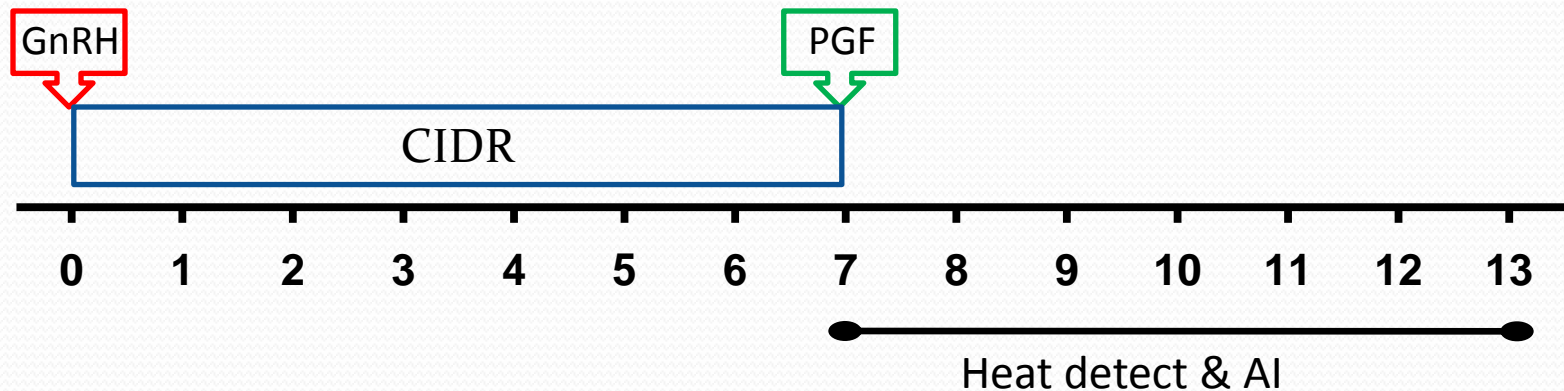
# Select Synch Protocol

## Cows



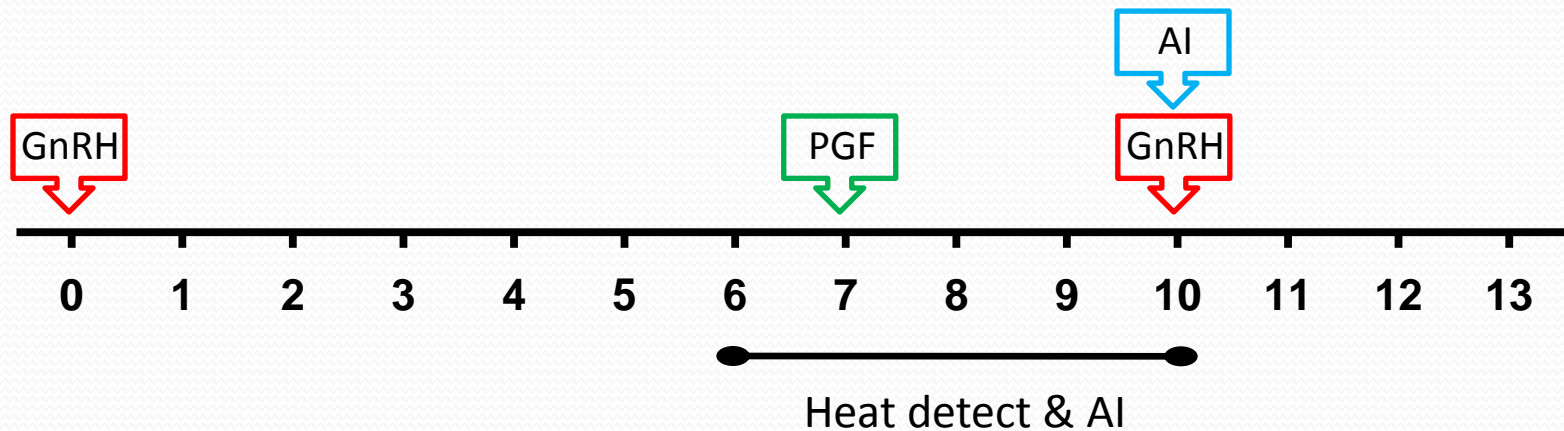
# Select Synch + CIDR Protocol

## Cows



# Select Synch and Timed AI (TAI)

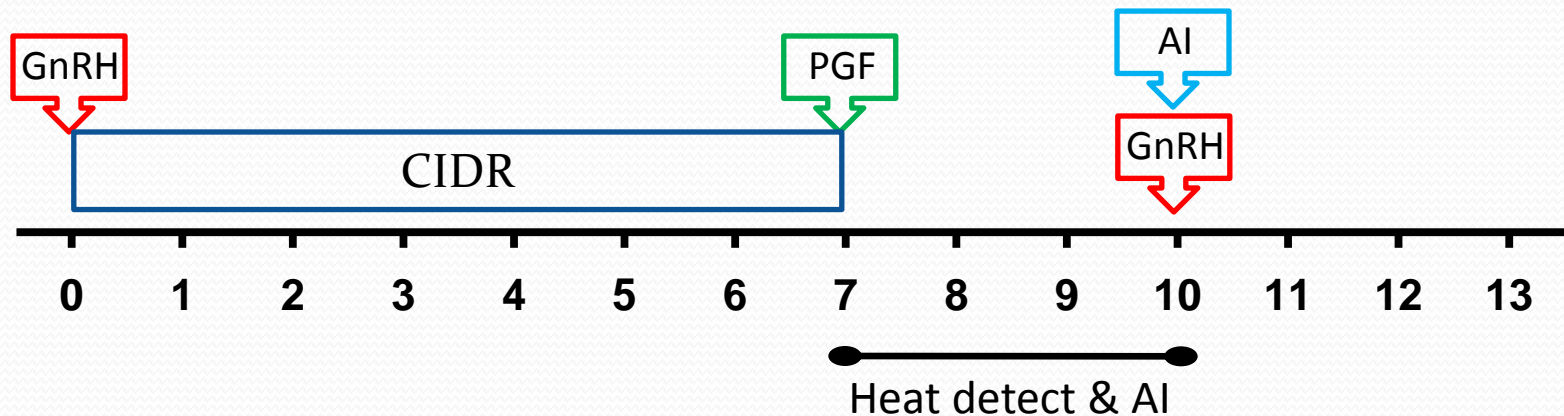
## Cows



- Heat detect and AI on days 6-10
- TAI all non-responders at 72-84 hr after PGF with GnRH at AI

# Select Synch + CIDR & TAI

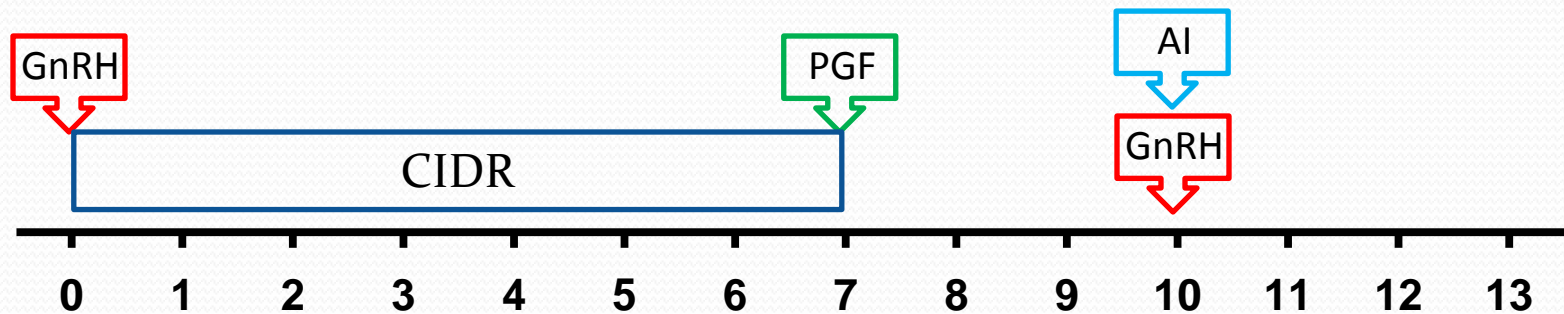
## Cows & Heifers



- Heat detect and AI on days 7-10
- TAI all non-responders at 72-84 hr after PGF with GnRH at AI

# 7-day CO-Synch + CIDR & TAI

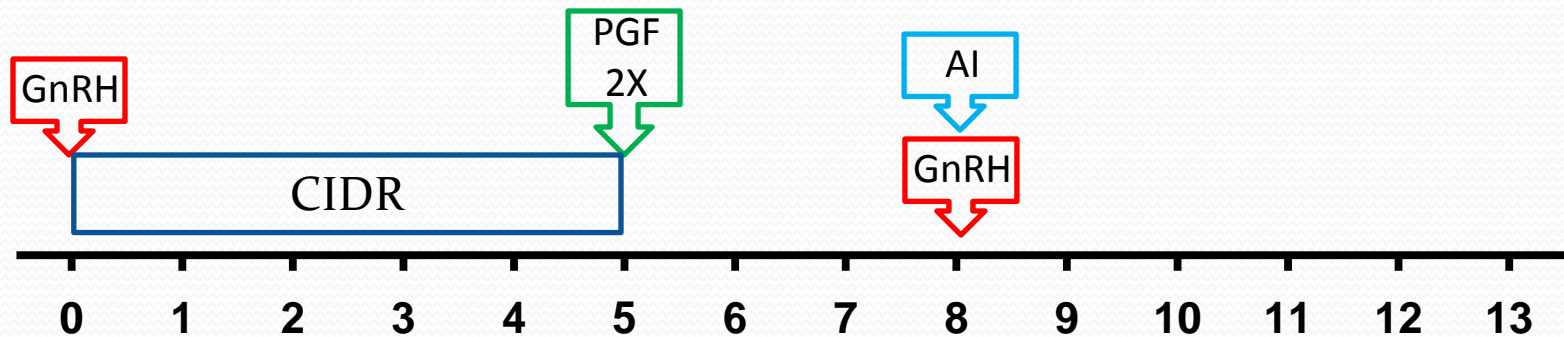
## Cows & Heifers



- TAI all cows at 60-66 hr after PGF with GnRH at AI
- TAI heifers 52-56 hr PGF with GnRH at AI

# 5-day CO-Synch + CIDR & TAI

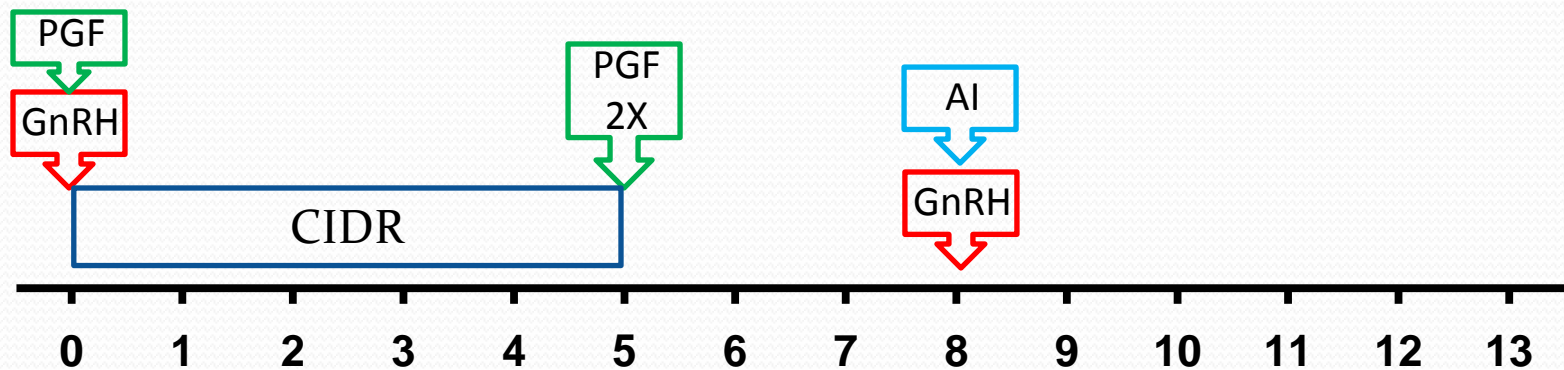
## Cows



- PGF given  $8 \pm 2$  hr apart
- TAI all cows at  $72 \pm 2$  hr after 1<sup>st</sup> PGF with GnRH at AI

# 5-day CO-Synch + CIDR & TAI

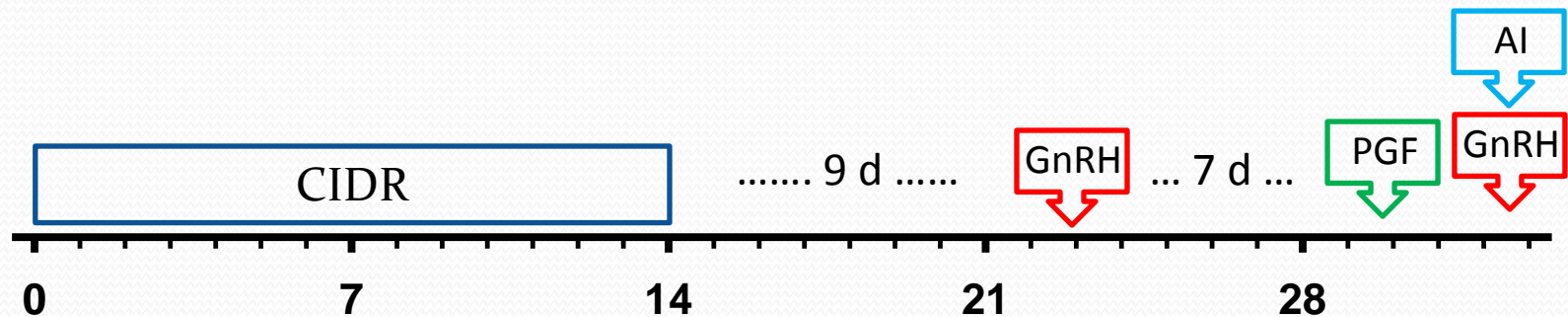
> 25% Bos Indicus Cows



- PGF given  $5 \pm 2$  hr apart
- TAI all cows at  $72 \pm 2$  hr after CIDR removal with GnRH at AI

# CIDR-Select

## Heifers



- TAI all heifers at  $72 \pm 2$  hr after PGF with GnRH at AI
- Must handle animals 5 times

# Which protocol is best for you?

- 7-day CO-Synch + CIDR & TAI or Select Synch + CIDR & TAI
- Both work with heifers and cows
- Gives option of heat checking or TAI
- Acceptable pregnancy rates reported in literature (> 60%)

# Questions?

