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Popular Article

Different Protocols for Induction and Synchronization of Estrus

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Introduction

Animal husbandry is the backbone of the rural economy, many farmers of rural India are depending on the animals' productivity for their daily income. Their daily bread and need are satisfied by the income of the Animal husbandry activity. Although we are the highest milk producers in the World, the milk yield of the cow in India is very less, so the number of cattle herds available in India is very high. And our Desi cows with because of the low genetic makeup for milk production, are low producers. But if you take Exotic and Crossbred cows, although they have early maturity and high milk yield, there is less disease resistance and more Infertility problems. After the introduction of the Cross Breeding program in India, the Infertility problem has become very high. So, to tackle the Infertility problem many recent reproductive techniques are available, with the reproductive Biologist. So, one such technique is the Estrous Synchronisation program. What is the fixed expectation from an ideal cow? Ideal dairy cows should have aged at puberty -18 months, age at first calving about 30 months, conception date which would have 80%, AI per consumption is 1.3 to 1.7. The calving interval must be 12 to 18 months, it should not exceed beyond this level. Calving to conception must be 60 to 90 days. So, Ideal dairy cows should have all these parameters so that the farmer can get benefit out of rearing the cow. The Delay in consumption rate, after 90 days of parturition, led to the loss of milk production up to 32% loss. Then medicine costs 13%. Calf loss 13%. The added Breeding cost comes around 11%. Then dairy animal maintenance comes to 31%. So, this is how the reproductive parameter, that is infertility causes, heavy economic loss to the farming community.

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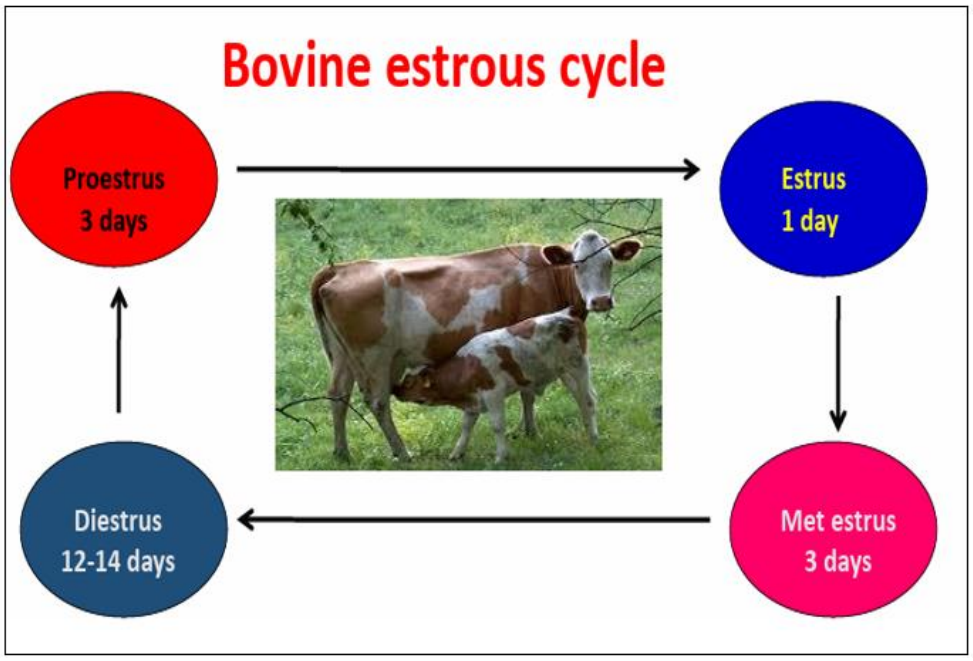
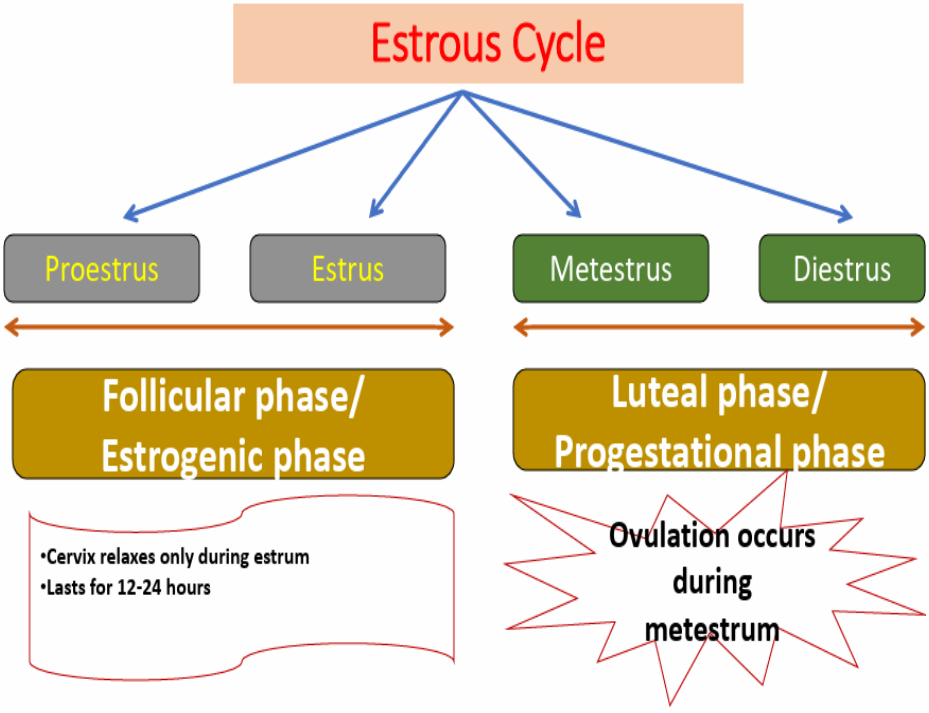
Bovine Estrous Cycle

The estrous cycle is a Physiological functional rhythm of the reproductive system. It comprises Proestrous, Estrous, Metestrus, and Diestrus. Proestrus and the Estrous together is called the Follicular phase. Metestrus and Diestrus are together called the Luteal phase. Total length of the Estrous cycle varies from 18 to 21 days. The expressive stage of the Estrous Cycle is only Estrous. So, always Estrous is 18 to 24 hours duration in cows and buffaloes.In buffaloes, it is a little bit high. Estrus Duration is 8 hours high; it may go up to 30 hours. Although it is a silent Estrous animal, the duration of Estrous is a little bit higher in buffaloes than in cows.





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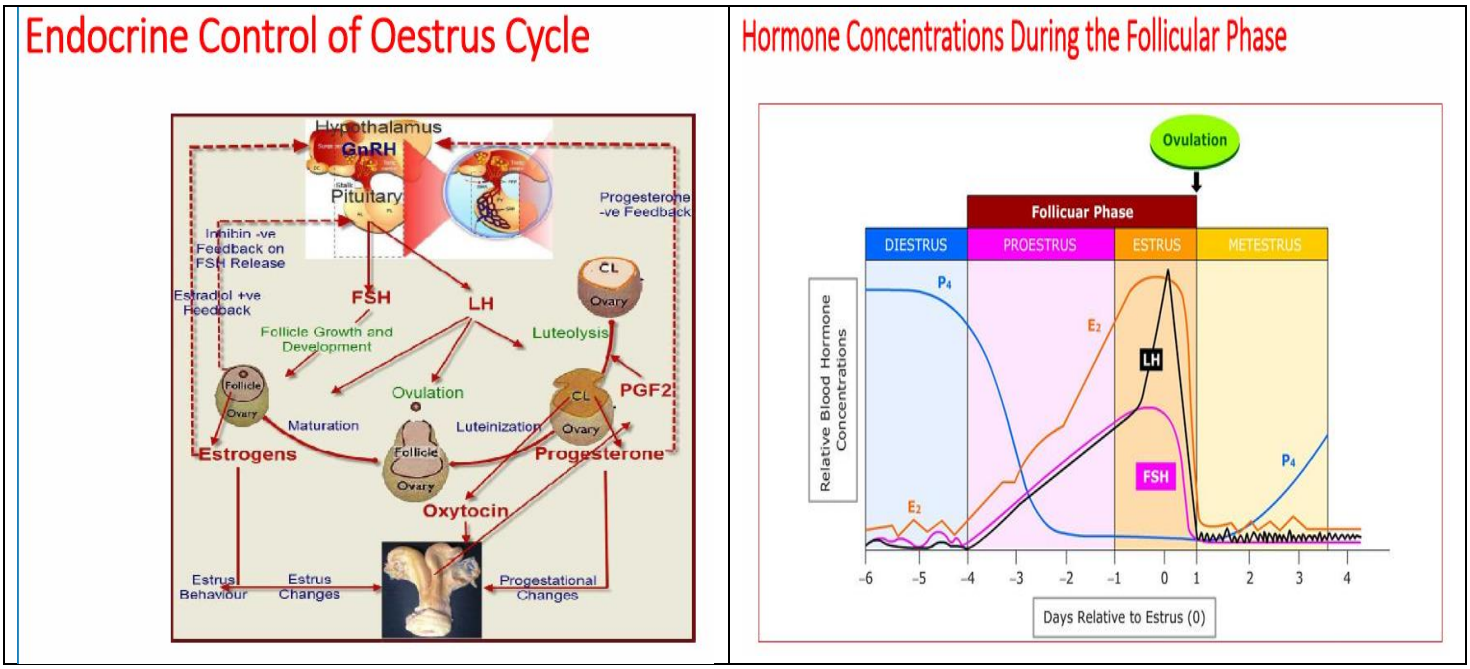

Synchronization of Estrus

Synchronization of estrus implies the manipulation of the estrous cycle or induction of estrus to bring a large percentage of a group of females into estrus at a short, pre-determined time by using an exogenous hormone (Odde, 1990).

The basic principle is the regulation of the life span of the Corpus Luteum (CL). There are two approaches available for Estrous Synchronization-one is shortening the luteal phase by using PGF2 Alpha and another one is extending the luteal phase by using Progesterone.

Estrous Synchronization protocols

1) Prostaglandin based protocol

2) Progesterone based protocol and

3) GnRH based protocol.

Benefits

- ❖ Better control of calving interval
- ❖ Group females for parturition
- ❖ Reduce time required for estrus detection
- ❖ Estrus detection with timed insemination
- ❖ Increased production with same number of cows
- ❖ Increased number of calves per cow
- ❖ Infertility

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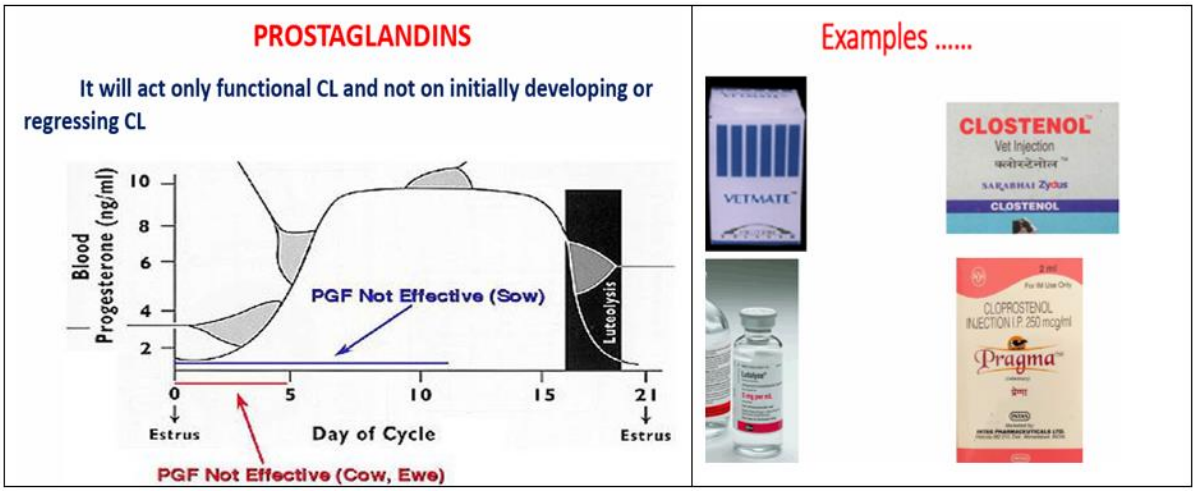
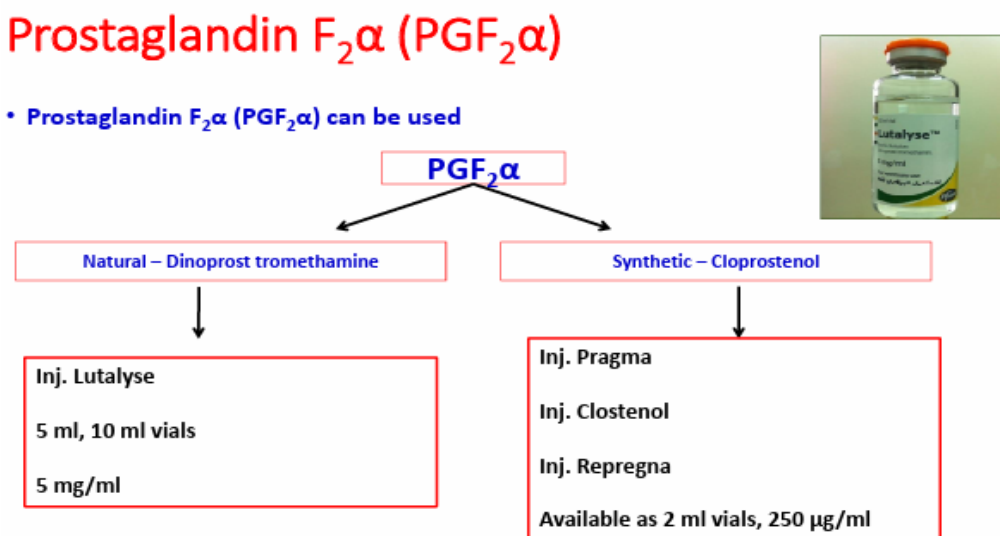
Criteria for Successful Controlled Breeding

- Animal requirement
- Disease free
- Heifer maturity
- Adequate nutrition
- Adequate postpartum interval
- Normal non pregnant reproductive tract
- For PGF2 alpha -animal must be cycling

Management Requirement

- Proper timing
- Good semen quality
- Good AI technique





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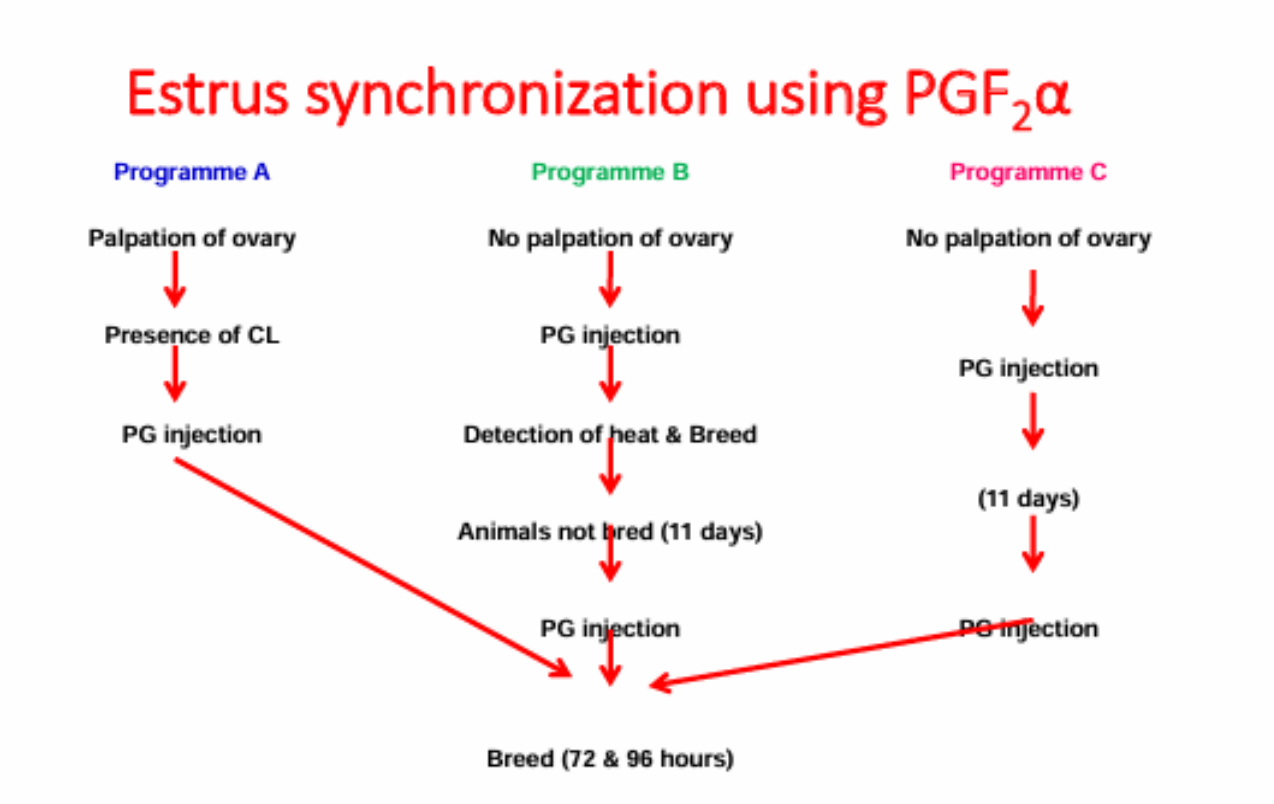

Progestogens

Principle: The exogenous progestogen continues to exert negative feedback on LH secretion after CL regression has occurred. When the progestogen is withdrawn, follicular growth, estrus and ovulation occur within about 2-8 days.

Administration:

- Injection
- Feed
- Implant
- Pessary or Control Internal Drug Release (CIDR)

Advantages

- CL need not be identified
- All the animals can be administered at the same time
- Even if the animal not cycling, they bring the animal into estrus
- All the other conditions with prostaglandins are also applicable to progestogens for success.

Progesterone Injections

50 mg daily or 500 mg every 10 days

Estrus will occur within 4-6 days post withdrawal of the treatment.

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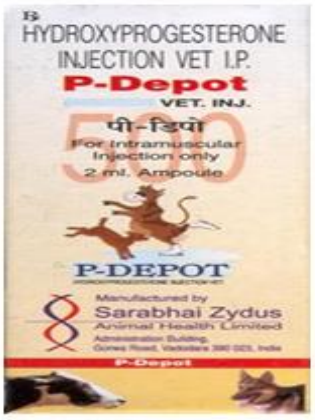
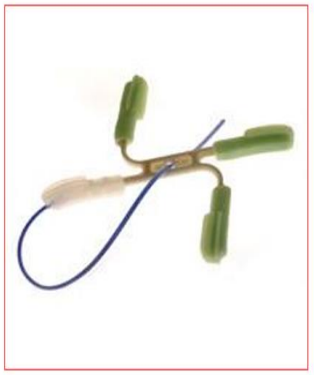


Controlled Internal Drug Releasing Device (CIDR)

- T- shaped nylon spine molded with a silicone rubber skin
- Contain 1.38 gm of progesterone
- Inserted inside the vagina

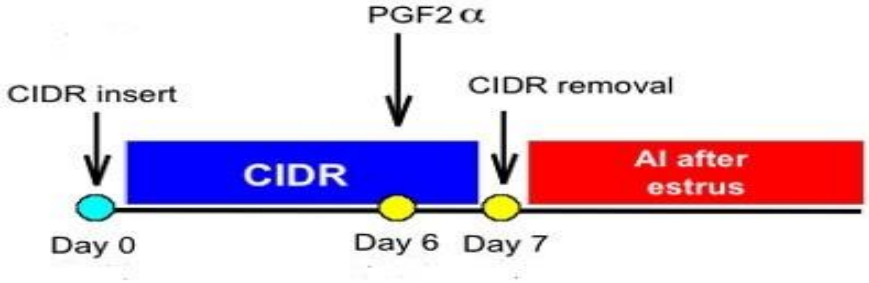
Progesterone impregnated intra vaginal device – TRIU B



- Each green ring has Progesterone 186 mg
- White color is dummy
- Additional pink color ring has 400 mg

Protocols for estrus synchronization

(1) **CIDR + PG-**



Insemination is done based on estrus or at 84 hrs following injection of PG.

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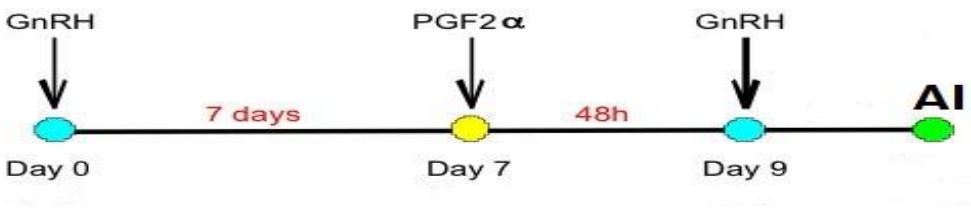
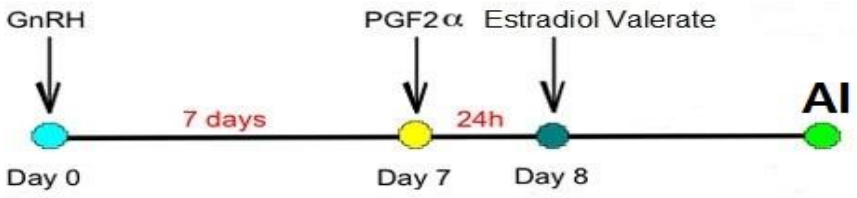
(2) **Ovsynch**

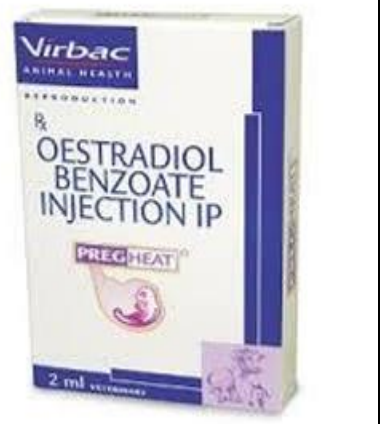


Insemination is done 24 hrs following second GnRH injection.

(3) **Heatsynch-**



Insemination is done 24 hrs following estradiol valerate injection (10th day).



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(4) **Two shot PG-**

Injection of first shot of prostaglandin on day 0 and second shot at day 11-12 and AI is done at detected estrus or at 72 and 96 hrs without reference to estrus.

(5) **CO-Synch-**

GnRH(day 0)→PG(day 7)→GnRH(day9)+AI

(6) **Select synch-**

GnRH(day 0)→PG(day 7)→ Estrus detection and AI, 3-5 days following inj. Of PG while non-responders are bred at 72 hrs with concurrent injection of GnRH.

References

Bihon, A., & Assefa, A. (2021). Prostaglandin based estrus synchronization in cattle: A review. Cogent Food & Agriculture, 7(1), 1932051.

Yizengaw, L. (2017). Review on estrus synchronization and its application in cattle. Int. J. Adv. Res. Biol. Sci, 4(4), 67-76.

Islam, R. (2011). Synchronization of estrus in cattle: a review. Veterinary World, 4(3).

Arya, D., Goswami, R., & Sharma, M. (2023). Estrous synchronization in cattle, sheep and goat. Multidisciplinary Reviews, 6(1), 2023001-2023001.

Pargi, Kalpesh Kumar, Mitesh Gaur, Dinesh Jhamb, Rohit Juneja, and Surendra Singh Nirwan. "Comparative Study of Different Estrus Synchronization Protocols in Pubertal Anoestrus Gir Heifers (Bos indicus)." (2023): 25-31.