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Process and importance of Artificial Insemination in Cows

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Abstract

For the continuity of life on this earth, reproduction is an important phenomena which is either done sexually or asexually. Among the five classes of vertebrate animals only mammals are viviparous i.e. can give birth to young ones but there are some who cannot conceive due to infertility disorders and thus artificial techniques of reducing the infertility percentage have been developed. Cattles being mammals can perform sexual mating naturally but in order to get an offspring as per our requirements like high milk yielding etc. Artificial insemination are performed. In India, the study of Artificial Insemination was first started in 1941 by Dr. Millar in Naini Agricultural University after which Indian Veterinary Research Institute also started the research in the field developing techniques of Artificial Insemination. In Order to perform Artificial Insemination, first of all healthy semen are collected from the fertile bulls by using a artificial vagina which is constructed in such a way that it feels like a natural vagina to the bull. The semen thus collected are injected in the Rectum of Cows by Rectovaginal method. In this method, a semen containing syringe is injected in the mid cervix within the rectum of the Cow. Artificial Insemination is complicated process and its success rate depends on a skillful hand. Therefore, in this paper we have briefly discussed the process and importance of Artificial Insemination in Cows.

I. Introduction

Artificial Insemination is the act of inserting semen collected from bull directly into the mid-cervix of the Cow's rectum via syringe (Robert Lewis et al., 2016). The approval of artificial insemination technology worldwide worked as driving force for the development of various technologies including technology to regulate the estrous cycle; technology used in embryo freezing, embryo harvesting, Cloning & Cryopreservation of Sperms etc.

Importance of Artificial Insemination:-

- ✓ Artificial Insemination is preferred more over natural mating as it produces a desirable characteristics of a bull and can be quickly pass on to more progeny.
- ✓ The chances of potential genetic selection are increased.
- ✓ The practice of artificial insemination is generally performed via Recto-vaginal method using artificial vagina; semen collecting tube & Syringe and thus it is safe for both animals & farmers.
- ✓ It reduces the chances of occurring of sexually transmitted diseases.
- ✓ It permits the use of fixed time insemination.

Disadvantages :-

- ➢ Artificial insemination requires well trained trainers and special equipment to perform operations.
- ➢ The risk of genital diseases increases if the bull is not properly treated.
- ➢ As the number of offspring increases per male the gene pool always decreases.

Evolution of Artificial Insemination:-

Artificial Insemination was started in India in1939 at Palace Dairy Farm (Mysore).It study was first initiated by Dr. Millar in Naini Agriculture University after which in 1942 Indian Veterinary Research Institute also started focusing in the direction of developing techniques of artificial insemination.

II. Process of Artificial Insemination

He stated that as the bull starts ejaculating the artificial vagina is properly lubricated and at the suitable temperature is fixed.

a) Artificial Vagina:-Hermal at (1939) studied on Artificial Insemination and stated that it is made of heavy rubber cylinder with the length of 16 ½ inches and diameter is 2 ¾ inches , he also mentioned that the hole at one end allows warm water filling to provide proper pressure.

b) Preparation of Artificial Insemination:-In order to collect the semen, the artificial vagina at an ambient temperature is lubricated and placed as such that it feels like natural one to the bull (O. conner., 2012).

c) Collection of Semen:- A Semen collector has following parts –

- **i.** It has a container made up of glass having water jacket & are marked with scales to determine volume of semen to be collected.
- **ii.** The semen collector is also fixed with a sleeve of latex which are thin & flexible and placed such that there are no folding inside its case while pouring water and blowing air through it.
- **iii.** The collecting tube is attached with a cone which joins at the end of the Vagina.
- **iv.** The walls of the tube are incased with cylindrical rubbers.
- **v.** The water poured in the vagina should have a temperature ranging between 40^{o} C to 42^{o}C and the temperature range of the semen collecting container should lie between 35^{o}C to 37^{o}C and thus for thermal protection a bag is anchored between the two.
- **vi.** A lubricating material is also used to lubricate the openings of artificial vagina.

As the bull ejaculates the semen it is collected in the semen collecting vial (Wiesetek 2011).

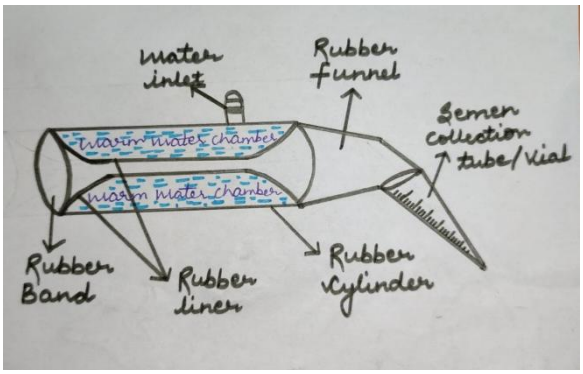

Fig.1- Preparation of Artificial Vagina.

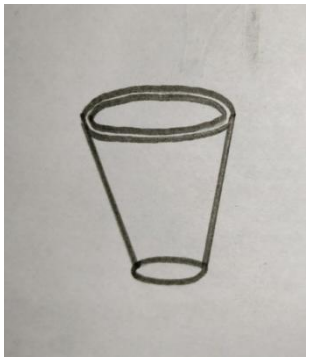

Fig.2- Semen Receiving Cone.

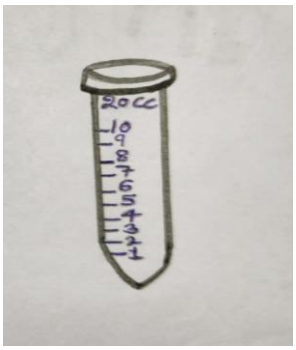

Fig.3- Semen Receiving Vial.

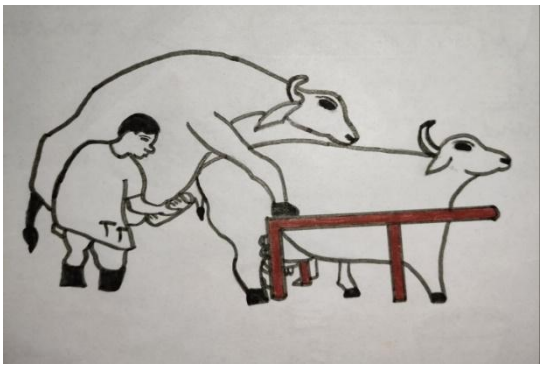

Fig.4- Method of Semen Collection.

Fig.5- Semen Containing Tube.

III. Insemination via Racto Vaginal Method

Before insemination it has to be make sure that the cow is in heat after which restraination is done by moving the tail in upward direction and cleaning the manure and debris from the vulva; then only the syringe containing the semen is inserted inside the Rectum of the Cow and is injected in her Mid-Cervix (Patel et al., 2017).

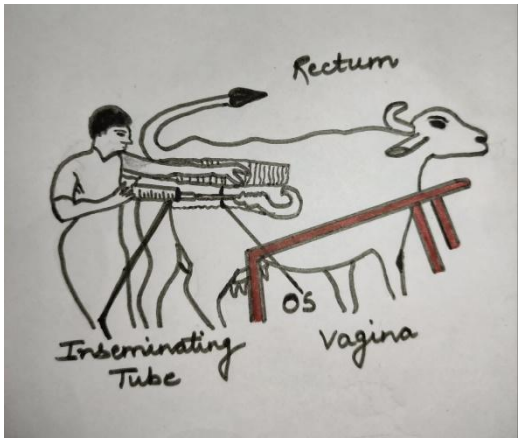

Fig.6 Recto-vaginal method.

Fig.7 Artificial Insemination.

Proper time for Insemination:-

The time period of insemination is different in different cattles because of theird ifferentre productive systems. So, some point should be kept in mind while doing Insemination are:-

1. Heat Duration.
2. Ovulation time.
3. Life of Ova in a system.
4. Life of Sperm (Bekele et al., 2016).

Pregnancy Diagnosis- For the fertility management pregnancy diagnosis is very essential. If pregancy diagnosis is not done animal keeper has to face a loss so, early detection of pregnancy is very important. Some methods of pregnancy Diagnosis are-

1) **Transrectal Palpation-** This test is performed after 70 days of Insemination because before this no changes is their reproductive tract shape occurs and this can be observed by the touching of fingers (Bekele et al., 2016).

IV. Conclusion

The trend of artificial insemination in dairy farming is increasing gradually as it not only improves the chances of animal productivity but also helps in getting an offspring with the superior quality with the decreasing chances of sexually transmitted diseases. Although the success rate of artificial insemination in India is very low but efforts are being made to develop strategies for improving the techniques of artificial insemination thereby uplifting of livelihood of dairy farmers.

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