

Recent concepts in management of fertility in cattle

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Introduction:

With the development of herd fertility control programs and the tendency to measure the fertility of the herd the individual cow is ignored. It is axiomatic that the fertility of the herd is just a reflection of the reproductive status of individual animals within the herd. Furthermore, problems identified in a few may indicate the likely infertility problems to come for the herd as a whole. Recent concept is to adopt methods to augment fertility in a herd rather than spend time and money on refractive infertile animals, whose condition is likely to be here dietary in nature.

What causes infertility:

There are several factors causing infertility and sterility. Anatomical defects of the reproductive tract, infections, endocrine disturbance and certain pathology of the reproductive tract are some of the factors that cause infertility and some time sterility. Nutrition and managemental factors also play equally important role in causing infertility. Male is an important factor to affect fertility in female. Semen from infertile bull and improperly preserved and handled semen when used for AI can cause infertility in a large female population. Unfortunately this andrological aspect is not being given the due importance.

There is yet another condition called 'Repeat breeder'. This condition is unique in that the affected animal will be normal and healthy but do not conceive to natural services or AI even after repeated breeding to fertile bull or semen. These cows will have normal estrous cycle length, and oestrus period with no palpable abnormality of the reproductive tract. Repeat breeding can result from ovulation failure, fertilization failure or early embryonic mortality.

Detailed investigation will help to identify the cause for infertility so that suitable treatment can be adopted. At the same time it is also very important to identify the sterile animal with changes like bilateral hydrosalpinx, ovaro-bursal adhesions etc., and remove them from the herd.

Managemental factors to control fertility:

1. Heat detection; 2. Proper and timely AI; 3. Early pregnancy diagnosis.

1. **Heat detection** :It is obvious that effective estrus detection is the key to maximize reproductive efficiency but estrus detection continues to be the main problem with the farmers. Even veterinarians and research workers consider heat detection is very important to achieve the optimum reproductive efficiency and reduce the reproductive failures.

Estrus detection problem are basically due to missed or unobserved estrus period and also due to errors in estrus detection methods. Failure to spend sufficient time daily for heat detection, want of correct knowledge about the signs of heat, failure to provide adequate space for the animals to move and exhibit the heat signs are some of the reasons for poor heat detection. Especially in buffaloes the heat period is short and also nocturnal. Many of the buffaloes do not show overt signs of heat. So use of teaser bulls in such farm will be ideal to detect estrus animals. Further proper maintenance of records such as heat expectancy charts etc. will help the farmer and also the visiting veterinarian to examine the animals at the expected time for specific changes in the reproductive tract. Use of heat detection aids such as K-Mars, Chin-ball -marker, pedometer and pressor-sensitive device are very popular in western countries wherein the animals remain in free ranges and

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the number is too many to practice individual examination.

2. Proper and timely AI: Artificial Insemination is the method of breeding cows and buffaloes. The practice of inseminating cows only at a particular time such as in the morning hours by bringing the cows in heat to the AI center by the farmer does not necessarily coincide with the optimum reproductive status of the cow for conception. The AI is either done early or late and so there is no synchrony and failure of fertilization occurs. Further with the use of frozen semen it is obligatory that the semen is deposited near the internal os of the cervix or in the body of the uterus to achieve optimum conception rate. Proper storage and preparation of the frozen semen is very important. In many occasions the semen used may not contain the adequate number of progressively viable sperms due to improper storage in the liquid nitrogen, improper thawing and improper method of loading and insemination technique.

3. Early Pregnancy Diagnosis: Early pregnancy diagnosis is yet another important management practice. Rectal examination is the common method adopted to diagnose pregnancy in large ruminants. In general practice, rectal examination is done by 2 to 3 months after breeding. It would be more economical and beneficial to the farmer if the pregnancy diagnosis is done earlier to this. If the pregnancy can be diagnosed by 22 days after breeding or at least if the non-pregnancy is identified by that time it will help the farmer to rebreed them in the next heat or subject the animal for investigation or /and treatment. Further, early detection of pregnancy reduces production time lost as a result of infertility. The silent heat in buffalo makes detection of pregnancy all the more difficult. Estimation of levels of progesterone in milk, by using kits,

pregnancy can be detected as early as 22 days. Recently identification of biomolecules such as Early Pregnancy Factor, Pre-implantation factor are considered as potential methods to detect pregnancy in bovines. These methods are not yet ready for field use. They are also found to be not very specific in Buffaloes. Accurate, easy, inexpensive, once only and uncomplicated method of early detection of pregnancy is yet to be developed for field use.

Management of Infertile cows: In a herd a regular practice of examining cows with the following signs should be adopted.

- Cows which has not exhibited heat signs by 45 to 60 days after calving.
- Cows with short or prolonged estrus cycle or prolonged estrus period.
- Cows which do not settle even after 3 AI with good quality semen.
- Cow with abnormal estrous discharge.

The following schedule may be practiced to examine and treat infertile cows:

- ♦ Detailed gynaecological examination of the reproductive organs preferably at the time of estrum.
- ♦ Give sexual rest for at least two estrus cycles.
- ♦ Study the nature of estrus discharge.
- ♦ Monitor the ovarian activity on the day of estrum, 2, 4, and 6 days after the estrum and again on the 12th and on 20th day after the estrum.
- ♦ Perform tubal patency test.
- ♦ Perform antibiotic sensitivity test with the uterine discharge to identify the specific antibiotics to treat possible subclinical endometritis.
- ♦ Use very good quality semen to

inseminate twice . One AI at the time of mid-heat and again repeat the AI preferably 6 hrs after the first AI.

- ♦ Use hormones as LH or GnRH at the time of AI to ensure ovulation
- ♦ Administer GnRH on 10-12th day after AI to fortify corpus luteal function.
- ♦ Fortify overall health by deworming, mineral mixture feeding and providing well balanced concentrate and green fodder to have positive energy balance.

Recent concepts to augment fertility in a herd:

In a herd prolonged inter-calving period is mainly due to delayed onset or failure to recognize the post partum estrum or/and prolonged time interval between the onset of estrum to conception. The first stage includes post-partum anestrus, silent estrum, unobserved estrum and subestrus or true anestrus. The second condition includes infertility due to specific conditions or due to repeat breeding syndrome.

To overcome these problems, recently, hormones like progesterone, prostaglandins alone or in combination are used to induce estrum, ovulation and also synchronize the estrum. The main practical advantage of this method are:

- Better control of calving interval.
- Reduction of the dependence of the heat detection methods
- Increased economic use of AI.
- Increase the number of calves per cow during her life time.
- Synchronise the calving

Prostaglandins:

In ruminants Prostaglandin F2 alpha is injected to bring about premature

regression of the corpus luteum. The injection can be given as single injection or as double injection at an interval of 11 days. Estrus will occur 2 to 3 days after the injection. The estrus is ovulatory and conception ensues if AI is done with good quality semen at the appropriate time. For this method to be successful, the animals to be treated should be healthy, normal calving, cyclical, and also in the increasing plane of nutrition. Prostaglandin is also used in the treatment of Cystic ovarian disorder, in endometritis and pyometra, in mummified and macerated fetus, in early embryonic death due to progesterone deficiency and to hasten postpartum involution of uterus and shorten the post partum anestrus period

Progestogens:

In animals with post partum anestrus Progestogens can be used to induce estrus and also ovulation. Synchronization of the estrus is also possible by this method.

The devices used are in the form of ear-implants and intra-vaginal devices. The ear-implant popularly known as syncro-mate B is implanted in the ear for 9 days and on withdrawal the animal will come to heat and the conception is also good. Similarly the intravaginal device known as PRID or CIDR are kept in the vagina for 12 days and on removal the animal will come to estrus. To make these devices to be more efficient in synchronizing the number of animals to come to estrus at the same time and also to increase the conception rate, prostaglandin or PMSG injections are given at the time of withdrawal of the implant.

Other recent developments in animal reproduction include ETT, IVF, transrectal ultrasound scanning and laparoscopy. However, application of these methods under field conditions to benefit the farmer is very much limited.

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