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Popular Article

Management of Repeat Breeding in Cattle and Buffaloes

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Abstract

Repeat breeding is a common reproductive disorder in cattle and buffaloes, leading to significant economic losses in the livestock industry. This article aims to review the various management strategies for addressing repeat breeding in these animals. Causes of repeat breeding include reproductive tract infections, hormonal imbalances, nutritional deficiencies, and environmental factors. Management approaches encompass proper estrus detection, hormonal therapy, nutritional management, control of reproductive tract infections, and genetic selection. Timely detection and intervention are crucial for effective management of repeat breeding, ultimately improving reproductive efficiency and profitability in cattle and buffaloes.

Introduction

Cattle and buffalo play an important role in maintaining a sustainable food production system in India. The productivity of bovine, however, remains low largely due to poor management of health, nutrition and breeding. The major problems faced by breeders and farmers include poor reproductive efficiency and prolonged inter-calving intervals. Clinical evaluations have shown that repeat breeding (RB) is the major cause of infertility in bovine. A repeat breeder is generally defined as any animal that has not conceived after three or more services associated with true estrus. The incidence of RB is high in cows compared to buffaloes (approximately 19 *vs.* 9%, respectively). RB syndrome is responsible for long service period and inter-calving interval thereby causing low milk and calf production resulting in to greater

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economic losses to dairy industry.

Causes of Repeat Breeding

The cause of RB is unclear and multifactorial. Hormonal insufficiency and dysfunction contribute about 40.1% causes of RB. Prolonged duration of estrus, extended follicular phase, delayed luteinizing hormone (LH) surge and thus delayed ovulation, late postovulatory rise in plasma progesterone considered to be most prominent factors responsible for RB. Failure of fertilization is mostly associated with poor heat detection by farmers, improper estimationof fixed-time artificial insemination (FTAI). It is also due to the abnormalities related to poor semen quality. Therefore, broadly major causes of RB can be classified as:

1. ***Genetics****:* Chromosomal or genetic abnormalities adversely affect bovine fertility. Factors like inbreeding, aged gamete also provoke genetic defects leading to RB. Certain breeds like Holstein and Jersey show high incidence of RB.
2. ***Genital defects****:* Anatomical or functional alterations in oviducts, ovarian bursa, uterine horns and body, cervix either due to injudicious handling while performing artificial insemination (AI), pregnancy diagnosis (PD) or during handling of dystocia can cause gestational failure and RB syndrome.
3. ***Age****:* Higher incidence of RB has been seen in old animals. It is observed that fertility in dairy cows gets better after the 1st or 2nd parity, and thendeclines from the 4^{th} and 5^{th} lactation onwards.
4. ***Body conditioning and nutritional causes****:* The fertility of the dairy animals is associated with their body weight. As per the recommendations of ICAR, dairy cow heifers should achieve above 250 kg and buffalo heifers must attain above 275 kg before breeding for optimal reproductive management. Underweight animals show poor rates of conception. In India, nutritional deficiency is considered as most important factor causing reproductive failures in bovine.
5. ***Uterine infections****:* The uterine environment encourages the normal embryonic development. Hence, any disorders or defects like uterine infections, endometritis, pyometra, metritis etc. adversely affect fertilization or survival of the embryo causing embryonic death which is also one of the major reasons for RB. Periparturient problems like dystocia, retention of fetal membranes, genital prolapse etc. lead to delayed uterine and cervical involution causing uterine infections, delayed ovarian rebound, high embryo mortality and RB.
6. ***Ovarian dysfunctions****:* Various ovarian dysfunctions like cystic ovarian degeneration (COD), luteal deficiency resulting into progesterone deficiency, incomplete luteolysis, delayed ovulation may also provoke RB syndrome. The problem of ovarian cysts

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(follicular and luteal) is quite common inexotic high yielder cows and is considered a major reason for reproduction failure.

7. ***Male factors:*** Any disorder at any action involving bull preparation, artificial vagina preparation, semen collection, semen processing, storage, thawing, post- thaw handling of semen may also result into RB syndrome.
8. ***Managemental issues:*** Any housing issue leading to environmental stress, lameness, inadequate estrus detection, incorrect timing of insemination in relation to stage of estrus, improper technique of AI etc. may cause RB amongdairy animals.

Management of repeat breeding

Certain issues related to genetics and anatomical defects are unavoidable and untreatable. Therefore, such problems must be identified early in life and culling of affected animals should be considered following thorough examination to reduce the economic losses. Timely deworming and balanced ration formulation for animal decrease the problem of repeat breeding. To control the uterine infections, periparturient care of the pregnant animals is most important. If uterine infection is diagnosed then treat the animal with broad spectrum antibiotics such as cephalosporins (Ceftiofur), tetracycline, metronidazole, enrofloxacin or on the basis of CST results. Injections of prostaglandins are preferred in cases of pyometra or persistent corpus luteum (CL) to clear the infections.

To reduce the environmental stress, avoid overcrowding in the sheds and provide both concrete as well as dirt floor. Adopt a practice of loose housing system. Provide as much as cool climate to the animals during summer specially to crossbred animals. Other manage-mental issues like improper maintenance of records, poor detection of estrus, improper timing and technique of insemination, and poor semen quality are also responsible for high incidence of RB among dairy animals.

Poor estrus detection is one of the most significant factors responsible for reproductive losses in a dairy herd. Different methods to improve estrus detection include: proper identification of animals (Good branding, large ear tags etc.), regular observation of animals (observe the animal for 15-30 min and 3-4 observations @ 6 h interval), adequate provision of light especially at night, heat expectancy charts **(s**pecial calendars used to record information), pressure-sensitive mount detectors, tail chalk, crayon, or paint, chin ball markers, heat watch, pedometer, cow scout, vaginal electrical resistance, ultrasound scanning, progesterone assay recording of vaginal temperature, trained dogs and rectal palpation. But the most important way is visual detection, thus experienced person should do that job.

Insemination should always be preferred at least 10-12 h before ovulation. Optimum time to inseminate is between 6-18 h after onset of estrus (standing estrus). It is better to give

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double insemination in crossbreds that should be done with the gap of 12-24 hours after first AI.

Last but not least, selection and timing of hormonal interventions to treat various conditions viz. luteal deficiency, COD, anovulation, delayed ovulation, persistent CL in absence of uterine infections are quite important to combat RB syndrome in dairy animals. For example, use of a luteolytic agent such as PGF2α, or an analogue, which causes the regression of the CL is successful when animals are bred to a detected estrus. This method does not control the time of AI, as estrus detection continues to be necessary.

Now days to further improve the conception rates, various modified GnRH based protocols viz. Doublesynch, Estradoublesynch, Presynch-Ovsynch, Presynch-Heatsynch etc. are preferred over traditional Ovsynch method.

Conclusion:

Repeat breeding poses a substantial challenge to the productivity and profitability of cattle and buffalo herds worldwide. However, through comprehensive management strategies, including accurate estrus detection, targeted hormonal therapy, nutritional optimization, and control of reproductive tract infections, the incidence of repeat breeding can be significantly reduced. Additionally, advancements in genetic selection for improved fertility traits offer long-term solutions to mitigate the occurrence of repeat breeding in these animals. A holistic approach that integrates these management practices is essential for optimizing reproductive performance and ensuring sustainable production in cattle and buffaloes. By implementing these strategies, producers can minimize economic losses associated with repeat breeding and enhance the overall efficiency of their livestock operations.

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