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Repeat Breeding in Indian Cattle: Causes, Impact and Preventive Management

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Abstract:

Repeat breeding is an important reproductive problem affecting the productivity and profitability of dairy cattle in India. A repeat breeder is generally described as a cow that fails to conceive after three or more services despite apparently normal reproductive organs and regular oestrous cycles. The condition is multifactorial and may involve inappropriate oestrus detection and artificial insemination (AI) timing, nutritional and metabolic disturbances, reproductive tract infections, hormonal abnormalities, heat stress and deficiencies in reproductive management. Repeat breeding increases the number of services per conception, prolongs the calving interval and increases the cost of maintaining non-pregnant animals. Studies from different regions of India demonstrate that its prevalence can be substantial, particularly in crossbred cattle. Effective prevention requires an integrated approach involving proper nutrition, accurate oestrus detection, timely and technically sound AI, prevention and control of reproductive infections, heat-stress mitigation and regular reproductive examination. Early identification and correction of underlying risk factors can improve conception rates and overall reproductive efficiency.

Keywords: Repeat breeding, cattle, infertility, artificial insemination, oestrus detection, reproductive management, India

1. Introduction:

Reproductive efficiency is a major determinant of productivity and profitability in dairy farming. An animal that conceives at the appropriate time after calving can maintain a desirable calving interval and contribute consistently to milk and calf production. Conversely, repeated failure to conceive increases the number of non-productive days and imposes additional costs on the farmer.

Among reproductive disorders, repeat breeding is an important field-level problem in dairy cattle. It is generally used to describe a cow that has regular oestrous cycles and apparently normal reproductive

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organs but fails to conceive following three or more services. The condition has been recognised as one of the important gynaecological problems affecting cattle and buffaloes in India (Agarwal *et al*. 2005). The prevalence of repeat breeding varies with geographical region, breed, production system, nutrition and management. A study conducted in Punjab reported an overall prevalence of 27.6%, with prevalence of 41.8% in crossbred cattle and 32.0% in indigenous cattle (Malik *et al*. 2019). More recently, a study involving 2,254 dairy animals in Tamil Nadu reported repeat breeding in 20.4% of the animals studied (Ravichandran *et al*. 2026). Such variation highlights the multifactorial nature of the problem and the importance of region-specific reproductive management.

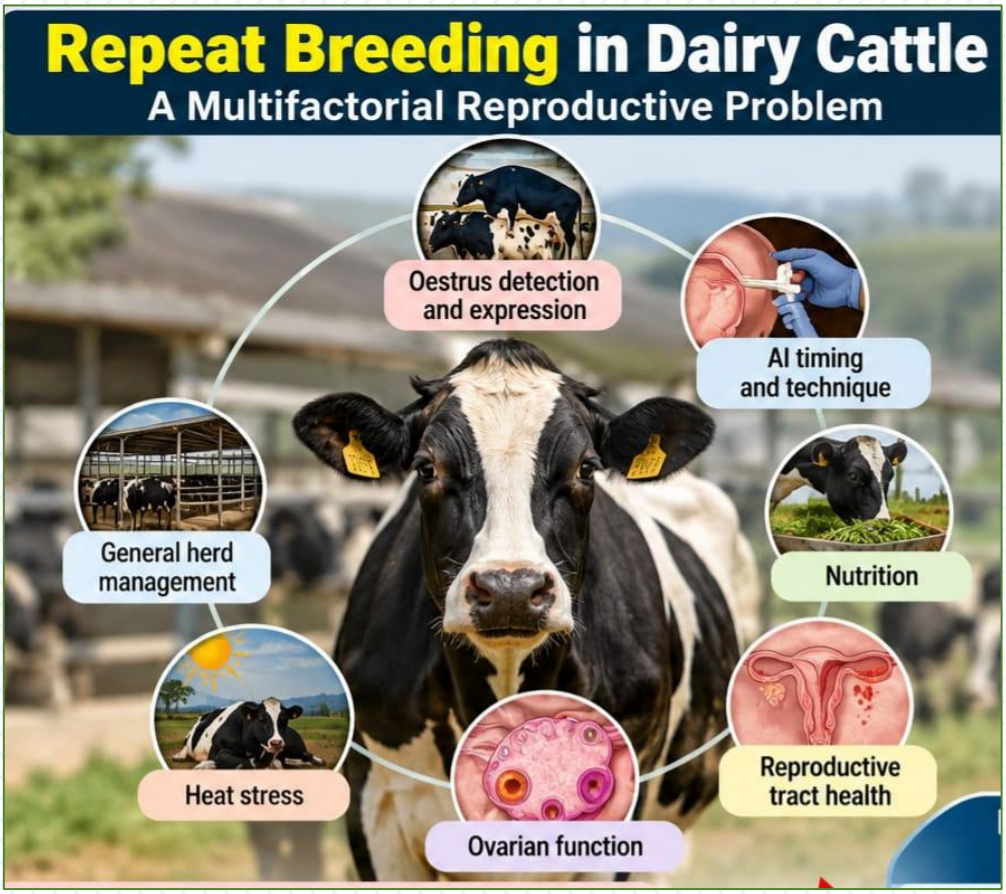
2. Causes of Repeat Breeding:

Repeat breeding is not a single-disease entity. Failure to establish pregnancy may occur because of problems associated with oestrus detection, ovulation, fertilisation, uterine environment or early embryonic survival. Multiple factors may act simultaneously in an individual animal.

2.1 Improper Oestrus Detection and Timing of Artificial Insemination:

Accurate detection of oestrus is essential for successful AI. Failure to identify the onset or duration of oestrus may result in insemination at an inappropriate time in relation to ovulation. This can considerably reduce the probability of conception. In field conditions, inadequate observation of animals, weak expression of behavioural signs and lack of proper reproductive records may contribute to inaccurate heat detection. Therefore, farmers should be trained to recognise behavioural and physical signs of oestrus and maintain appropriate breeding records.

The competence of the inseminator and proper handling of semen are also important. Insemination should be performed by trained personnel using appropriately stored and handled semen. Improper technique can potentially cause genital tract trauma and compromise reproductive performance (Singh *et al*. 2017).



2.2 Nutritional and Metabolic Factors:

Adequate nutrition is essential for normal ovarian activity, oocyte development, conception and maintenance of pregnancy. Inadequate energy intake, particularly around the transition period and early lactation, may adversely affect reproductive performance.

The Punjab study found that repeat breeders were frequently high-yielding animals and that affected animals tended to have below-average body condition scores (Malik *et al*. 2019). This emphasises the importance of maintaining appropriate body condition and providing balanced nutrition according to production and physiological status. Rather than attributing repeat breeding to a single mineral deficiency, nutritional management should focus on providing adequate energy, protein, minerals and vitamins through a balanced ration appropriate for the animal's requirements.

2.3 Reproductive Tract Infections:

The health of the uterus and reproductive tract is essential for successful establishment and maintenance of pregnancy. Clinical and subclinical uterine infections can adversely affect the uterine environment and may interfere with fertilisation or early embryonic development. Reproductive diseases such as brucellosis and other infectious conditions can also contribute to reproductive losses and infertility. Therefore, animals showing repeated reproductive failure should undergo appropriate clinical and, where indicated, laboratory evaluation rather than receiving repeated empirical treatments (Agarwal *et al*. 2005).

2.4 Ovarian and Hormonal Disturbances:

Normal follicular development, ovulation and corpus luteum function are essential for successful conception and pregnancy establishment. Delayed ovulation, anovulation, ovarian cysts and other disturbances of the oestrous cycle can therefore contribute to repeated conception failure. Hormonal interventions may have a role in selected cases, but treatment should be based on the reproductive diagnosis rather than being administered routinely to every repeat breeder (Singh *et al*. 2017).

2.5 Heat Stress:

Heat stress is an important environmental factor affecting reproductive performance in dairy cattle. Increased temperature and humidity can alter reproductive physiology and adversely affect conception and pregnancy rates. Dash *et al*. reported that reproductive performance in dairy cattle declines with increasing temperature-humidity index (THI), with conception and pregnancy rates declining when THI exceeds approximately 72–73 in cattle (Dash *et al.* 2016).

This is particularly relevant in India, where cattle may experience considerable heat load during summer months. High-producing animals may be especially vulnerable because of their greater metabolic heat production.

2.6 Management-related Factors:

Poor postpartum management, inadequate hygiene, delayed detection of reproductive disorders, inappropriate breeding practices and inadequate record keeping can all contribute to reduced reproductive efficiency. A herd-level approach is therefore necessary because repeated conception failure may reflect shortcomings in the overall reproductive management system rather than a problem restricted to one animal.

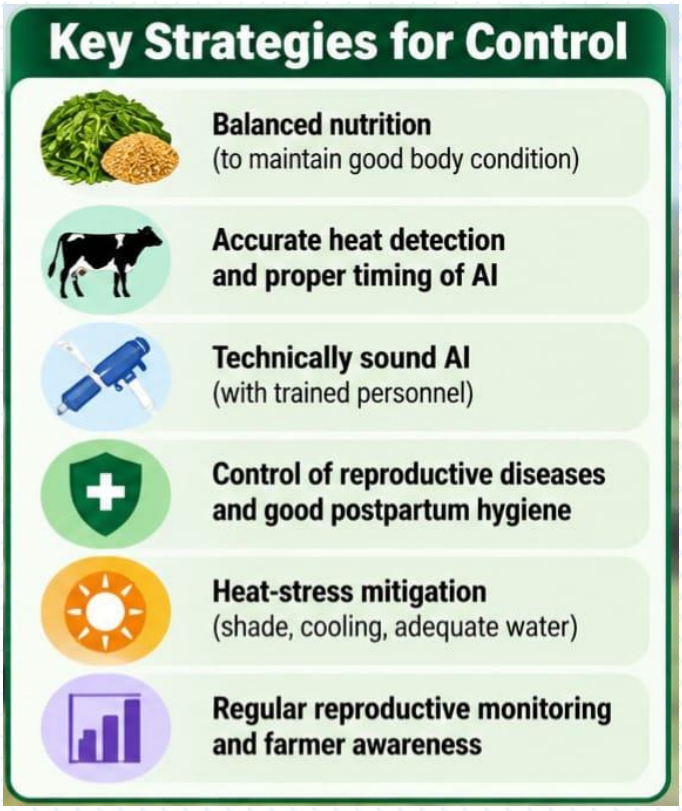
3. Impact of Repeat Breeding:

The consequences of repeat breeding extend beyond failure to achieve pregnancy. Repeated unsuccessful services increase expenditure on semen, AI and veterinary services. More importantly, delayed conception increases the number of open days and prolongs the calving interval. This reduces reproductive efficiency and increases the period during which the animal has to be maintained without producing another calf.

In addition, prolonged reproductive failure may eventually result in culling of otherwise productive animals. The economic burden can therefore arise from increased treatment and breeding costs, prolonged maintenance of non-pregnant animals and loss of potential production. At the herd level, a high proportion of repeat breeders can indicate underlying problems with heat detection, AI technique, nutrition, disease control or general reproductive management. Addressing the underlying cause is therefore more useful than repeatedly treating individual animals without diagnosis.

4. Management and Prevention:

The most effective strategy for controlling repeat breeding is prevention through systematic reproductive management.



4.1 Accurate Oestrus Detection:

Farmers should be trained to recognise signs of oestrus and observe animals regularly. Particular attention should be given to standing behaviour, mounting activity, restlessness and changes in vulval appearance or vaginal discharge.

Maintaining records of oestrus and AI dates helps identify the appropriate breeding time and allows animals with repeated conception failure to be recognised early.

4.2 Proper Timing and Technique of AI:

AI should be performed at the appropriate stage of oestrus by a trained technician. Semen should

be maintained under proper storage conditions and handled correctly during thawing and insemination.

Animals that have already failed to conceive repeatedly should ideally undergo reproductive examination before another service rather than being subjected to repeated inseminations without determining the possible cause (Singh *et al*. 2017).

4.3 Balanced Nutrition:

Adequate energy and protein supply, together with appropriate mineral and vitamin nutrition, should be ensured throughout the production cycle. Particular attention should be paid to the transition period and early lactation, when nutritional demands are high. Body condition should be monitored regularly because both inadequate and excessive body condition can be associated with reproductive problems.

4.4 Prevention and Control of Reproductive Infections:

Good hygiene during calving and the postpartum period can reduce the risk of uterine infections. Animals with abnormal postpartum discharge, delayed uterine involution or other reproductive abnormalities should receive timely veterinary attention. Herds should also follow appropriate biosecurity and reproductive disease-control measures. Where an infectious cause is suspected, appropriate diagnostic testing should be undertaken before implementing herd-level interventions.

4.5 Heat-stress Management:

Heat stress can be reduced by providing adequate shade, ventilation and access to clean drinking water. Where feasible, sprinkling, misting or other cooling strategies can be used during periods of high heat load. Feeding and management practices may also be adjusted during the hottest part of the day. Reducing heat load is particularly important during the breeding period because thermal stress can adversely affect conception and early pregnancy (Dash *et al.* 2016).

4.6 Regular Reproductive Examination:

A cow that repeatedly fails to conceive should undergo systematic reproductive evaluation. Depending on the case, this may include reproductive history, clinical and rectal examination, ultrasonography and appropriate laboratory investigations. The objective should be to determine whether conception failure is associated with oestrus detection, ovulation, ovarian function, uterine health, infectious disease, nutrition, AI technique or early embryonic loss.

4.7 Maintaining Reproductive Records:

Accurate records are one of the simplest and most useful tools for improving herd reproductive efficiency. Records should include calving dates, dates of observed oestrus, AI dates, number of services, pregnancy diagnosis and postpartum reproductive problems.

Regular review of these records can help identify repeat breeders early and can also reveal herd-level trends requiring corrective action.

5. A Preventive Approach for Indian Dairy Farms:

Repeat breeding should ideally be addressed before it becomes an established problem. A practical preventive programme can be based on five key components:

Observe → Record → Examine → Inseminate correctly → Monitor pregnancy

Farmers should regularly observe animals for oestrus, maintain reproductive records and seek veterinary examination when conception does not occur as expected. AI should be performed by trained personnel using properly handled semen, while nutrition, body condition, uterine health and heat stress should be monitored continuously.

This approach is particularly important in Indian dairy farming systems, where small herd sizes, variable feeding practices, limited reproductive records and seasonal environmental stressors can make reproductive management challenging.



6. Conclusion:

Repeat breeding is a multifactorial reproductive problem influenced by oestrus detection, AI timing and technique, nutrition, reproductive health, ovarian function, heat stress and herd management. Effective control should focus on prevention, early diagnosis and systematic reproductive monitoring rather than repeated empirical treatment. Balanced nutrition, accurate heat detection, proper AI, disease control, heat-stress management and farmer awareness can improve conception rates, reduce calving intervals and minimise economic losses in Indian dairy farming.

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