



Management approaches to improve reproductive efficiency in dairy cattle

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India has highest milk producing country in the world, but in comparison to other countries, the productivity of the indigenous animal is very low. The reasons behind that low productivity include low genetic potential, inadequate feeding and poor reproductive management practices. Therefore, the economics of dairy farming is dependent on reproduction efficiency of animal.

Reproductive efficiency

Reproductive efficiency is measured by the timelines of getting a cow bred and producing a healthy calf within one year. The reproductive efficiency includes age at puberty, sexual maturity, age at first calving, services per conception, conception rate, calving interval and period between calving to conception. Poor management cause stress and increase in incidences of mastitis, uterine infections, metabolic disorder leads to decreases the reproductive life of animals. Reproductive efficiency of cattle can be improved by modification in the feeding, management and disease control.

Strategies to improve reproductive efficiency

Strategies for improve reproductive efficiency of dairy cattle through the nutritional manipulation and management of critical factor to reduce the certain extent. Strategies for the heifer management, estrus detection and transition cow management.

Heifer Management

Age of puberty and sexual maturity are important indicator of reproductive efficiency in dairy animals. Onset of puberty in dairy animals is depending upon the genetics and environmental factors. Puberty in Indian dairy animals is varying range between 18 to 40 months. Attain around 40-50 % of mature body weight at puberty but breeding should occur at 50-60% of mature body weight (Boro *et al.*, 2016). Poor nutrition, exposure of heat stress during growth period affects the onset of puberty. Heifers should gain weight an average 500 gm/day prior to breeding while heifers gaining slowly can have reduced conception rates. Heifer managemental practices are maintaining proper growth and early onset of puberty and sexual maturity includes:

1. Feeding of good quality green fodders with concentrate mixture for obtain daily growth rate about 500-550 gm in crossbred and 450-500 gm in indigenous calves.
2. Heifer management during summer is necessary for better growth. Structural design of shelter, environmental control, providing water sprinkling and nutritional management during hotter part. Provision of ceiling fans in cattle shed during cool hours mainly in the night, provision of mist cooling devices and wallowing especially in buffalo heifers.
3. The advance pregnant heifers should be trained for milking by taking them to the milking parlour along with the milking cows and allowed to go through the milking routine.

Estrus detection efficiency

Accurate and efficient detection of estrus in dairy cattle and buffaloes is an important factor of good reproductive management. Accurate heat detection is necessary for successful insemination programs. Inadequate heat detection affects herd profitability due to poor conception rate, requires more number of services per conception and extended calving intervals (Patterson *et al.*, 2003). Cows should be monitored for estrus two to three times daily for 30 minute periods in morning and evening hours. Use of heat expectancy charts are best assists for heat detection.

Good flooring can improve heat detection. Synchronization of estrus with use of reproductive hormones also increases the probability of detecting estrus at appropriate time.

Transition cow management

Transition period is defined as the period 21 days before and 21 days after calving in dairy animals. This period is the most challenging period of cow because several metabolic, physiological and endocrine changes occurs (Drackley, 1999). During transition period cow undergoes dramatic changes in physiological, metabolic and endocrine aspects related to parturition and the onset of lactation (Bell, 1995). Dairy cows are also forced to adapt to numerous management challenges during the transition period such as social regroupings and changes in diet. These challenges compromise the immunity against various diseases and increase incidence of infectious diseases. Therefore, herd health management practices improve the animal ability to cope up with the stressful condition and increase post-partum conception rate and reproductive efficiency.

Maintaining proper Body Condition Score (BCS):

Body condition scores is indication the energy status of dairy cattle. Body condition score of cow during transition period is about 3 to 3.5. Body condition scores of animal are influence the productivity, reproduction, health, and longevity of dairy cattle. The feeding of good quality green, dry fodders and supplementation of 1-2 kg of concentrate mixture per cow per day during dry period maintain the body condition of cow. Supplementation of Vitamin E and selenium during transition period improves the immunity and decreases incidence of mastitis and retained placenta, post-partum uterine infections. Regular examination of those animals and history record related with parturition problem such as dystocia, prolapse, abortion, torsion, retention of placenta, ketosis and milk fever. Diagnosis of susceptible animals to uterine infections at an early stage and they will treated immediately to improve the postpartum reproductive efficiency. Monitoring social behaviour during the transition period may be another tool that can be used to identify animals that are at greater risk of developing health complications.

Management of animal to prevent postpartum metabolic disorders

Successful reproduction depends on a stage of physiological change like resumption of ovarian cyclicity postpartum, development and ovulation of a viable oocyte, fertilization, embryo development and implantation, and maintenance of pregnancy until fetal maturation (Garnsworthy *et al.*, 2008). Metabolic diseases like Milk fever, subclinical hypocalcaemia, clinical and subclinical ketosis are important predisposing factors that lead to increased incidence of post-partum uterine infections and mastitis. Negative energy balance during transition period increased incidences of Subclinical and clinical ketosis adversely affecting cow fertility during post-partum period. Therefore it is essential to maintain proper BCS by ensuring adequate feed intake during transition period is essential to prevent incidences of metabolic diseases.

Breeding records

Regular monitoring record keeping of dairy animal to improve reproductive and breeding efficiency. The breeding records necessary for calculations of the indexes are:

Date (month, day, and year) of the most recent calving

1. Date of the previous calving for second and later lactation cows
2. Reproductive status (pregnant, open, and bred but too early to detect pregnancy)
3. Number of services for all cows
4. Date of first breeding and most recent breeding if a cow has been bred more than once.

Management to improving postpartum reproductive performance

The hormonal intervention in early postpartum period are helpful in maintaining the reproductive tract in estrogen dominance for first 45 days and in progesterone dominance from 45 days onwards before normal breeding thereby achieving the desirable calving to conception interval with higher conception rate. Supplementation of Vitamin-E and Selenium results in improving immunity thereby significantly reducing the incidence of mastitis, retained placenta, uterine infections like endometritis, metritis etc.

Conclusion

It can be concluded that efficient reproductive performance in dairy animals need best management and balance nutrition. Therefore, it is required to more energy diet to maintain optimum BCS and reduce the risk of postpartum metabolic and reproductive disorders. Supplementation of high energy nutritional feed to improve reproductive efficiency in dairy animals.

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