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Field Study About Incidences and Management of Reproductive and Metabolic Disorder Occurring During Transition Period

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Abstract

The dairy sector had a crucial role as it supplemented the family income, backed up household nutritional security, and generated employment in the country India for millions. To improve the productivity of dairy animals is one of the major challenges faced by dairy farmers which were mainly influenced by productive and reproductive traits. Considering the above facts there is a vast scope for increased productivity through improved transition period management. The transition period of a cow is generally defined as 3 weeks before calving to 3 weeks after calving. During this period, dairy cows are highly susceptible to metabolic and infectious diseases; therefore, prior identification of disease may be especially useful at this time. Thus keeping these points in view the above study was conducted for the assessment of incidence and various dairy farm management practices followed by the farmers. An ex-post facto study was conducted in Mathura district of Uttar Pradesh. First-hand information was collected from 100 dairy farmers. The study stated that the incidence of prolapse was highest in the buffalo (7.41%). The results of metabolic disorder incidence reveal that the occurrence of milk fever was 2.21, 3.65, and 1.23 in indigenous, crossbreed, and buffalo respectively. It can be concluded that the result shows that the incidence of RFM was highest in crossbreed animals followed by buffalo and indigenous animals. It was further seen that the occurrence of mastitis is highest in crossbreed animals. Thus it can be concluded that measures should be adopted for better management of the transition period among farmers. Specialized training and tailored programs can be arranged at the grassroots level to enhance the knowledge of the farmers regarding improved practices.

Keywords: Dairying, Incidence, Metabolic Disorder, Reproductive Disorder, Transition Period.

Introduction

Dairy sector plays a crucial role in the Indian economy by supplementing the family income, strengthening household nutritional security and generating gainful employment for 22.45 million people (Srivastava, 2016). Livestock sector contributes 5.3% of total Agriculture GDP and about 150 million people depend upon livestock for their livelihood. India is home for 536 million animals out of which 192.49 million are cattle and 109.85 million are buffaloes. Though India is highest milk producing country in the world, the production potential of our indigenous animal is less as compared to their population because of which large disparity exists in our country in terms of milk production. (Kale *et al*., 2016). Improving the productivity of farm animals is one of the major challenges faced by country (Singh *et al*., 2020). Milk production and associated economic returns from dairy animals depend on productive and reproductive performance of dairy animals. This is one of the reasons why reproductive disorders occur mostly during transition period of dairy animals. The transition period of a cow is generally defined as 3 weeks before calving to 3 weeks after calving (Grummer, 1995). During this period, dairy cows are highly susceptible to metabolic and infectious disease; therefore, prior identification of disease may be especially useful at this time. Metabolic disorders are a key problem in the transition period of dairy cows and often appear before the onset of further health problems. It is the most challenging and critical period in relation to the dairy cow's health status during the lactation cycle. Major physiological, nutritional, metabolic, and immunological changes occur within this time frame as the production cycle of the cow shifts from a gestational non-lactating state to the onset of copious milk synthesis and secretion (Bell, 1995; Sordillo and Raphael, 2013). It was stated that major disease incidences (mastitis, ketosis, digestive disorders, and lameness) occur in the first 10 days after parturition. LeBlanc *et al.* (2006) revealed that nearly 75% of disease incidences in adult dairy cows significantly occur in the first month after calving. Most livestock farmers are less educated and landless; therefore, they depend on traditional knowledge for the rearing of animals. The traditional system holds many good points from farmer's point of view and with the situations prevailing among farmers, there is a great demand for intervention of certain external systems in terms of new technologies or innovation, which can increase productivity and improve the farmer's income. Correct interventions and proper management are the keys to enhancing the productivity of the animals as well as improving the economic status of the farmers. The development of scientific animal husbandry techniques has steadily increased productivity and widespread diffusion of these techniques has eventually led to enhanced growth in this sector. The present study was conducted for the assessment of incidence and various dairy farm management practices followed by the farmers.

Materials & Methods

The study was conducted in Mathura district of Uttar Pradesh. Mathura is purposively selected as it is among the high milk-producing districts of the state and it is the hub for production of milk-based sweets. Multi-stage random sampling technique was used to select the respondents from ten blocks of Mathura district. While selecting the respondents' due care was taken that the responding farmer should have at least one year of experience of following transition period practices and he/she should be possessing at least one calf. A total of 100 respondents (10 respondents from each randomly selected village) were sampled for obtaining the first-hand information through personal interview method. Well-structured interview schedule was formulated for the collection of information about incidences of Reproductive and Metabolic disorder occurring during the transition period of dairy animals by the respondents in the study area. Data were analysed in term of descriptive statistics like percentage, mean, standard deviation, etc.

Results and Discussion

The herd size of the respondents ranges from 4-10 animals and majority of them have more than five animals in their herd. The study revealed that among all the 100 respondents, 24.00% and 32.00% were having small and medium (4-6 dairy animals) herd size and 44.00% of respondents possess large herd size of more than six animals. Out of total 652 animals possessed by the respondents 136, 192 and 324 were indigenous cows, crossbred cows and buffaloes respectively. Buffalo was the most preferred animal of the respondents in the study area as their milk is richer in fat and protein than that of dairy cattle.

Table 1: Category wise distribution of dairy animals per household

S/No.	Particulars	Indigenous	Crossbred	Buffaloes	Total
1.	In milk Non-pregnant	48	76	140	264
2.	In milk Pregnant	24	44	84	152
3.	Dry	8	12	24	44
4.	Pregnant heifer	12	12	24	48
5.	Calves	44	48	52	144
6.	Adult male	0	0	0	0
	Total	136	192	324	652

Incidences of Various Diseases During Transition Period of Dairy Animals

Incidence of diseases is evaluated to measure the occurrence of the various disease events within definite time period in a specific animal population. The results presented in table reveals that the incidence of RFM was highest in crossbreed animal followed by buffalo and indigenous animals. The incidence of metritis and prolapse was highest in the buffalo (11.42% & 7.41%). The study conducted by Dharmesh *et al.,* 2012 also state that incidence of retention of placenta was more in buffaloes (8.46%) followed by cross breed (2.13%). While Madhu *et al.,* 2013 revealed that occurrence of pre partum complications was 12.83%, whereas the occurrence of postpartum complications was 45.36. The study from Haryana also reported that the rates of occurrence of various reproductive disorders were 26.33% for retained placenta, 23.66% for metritis, 17.00% for dystocia and 16.00% for vaginal/uterine prolapse (Meena and Malik, 2009). The rate of abortion and retained placenta was highest i.e., 56.00% and 50.00% respectively in large farms (more than 10 animals) as compared to small and medium farms (Deka *et al.,* 2021).

Table 2: Incidences of various reproductive disorders in dairy animals of the study area

S/No	Diseases	Indigenous	Crossbred	Buffaloes
1.	Dystocia	2.21	4.17	5.25
2.	Retention of foetal membranes (RFM)	6.62	13.54	12.96
3.	Metritis	5.15	10.94	11.42
4.	Prolapse	0.74	3.65	7.41

(All the values are in percentage)

The results of metabolic disorder incidence reveal that the occurrence of milk fever was 2.21, 3.65, and 1.23 in indigenous, crossbreed, and buffalo respectively. It was further seen that the occurrence of mastitis is highest in crossbreed animals. Overall it was seen that rates of occurrence of milk fever, mastitis and udder oedema were highest in crossbred cattle as compared to indigenous cattle and buffaloes and those were 3.65%, 7.29% and16.67% respectively. Nimbalkar *et al.* (2020) found out that nearly 12.05% of the dairy animals in the state of Punjab were suffering with subclinical mastitis. According to Van Saun and Sniffen (2014), out of the total peri-parturient metabolic diseases, subclinical metritis and subclinical ketosis have high rates of incidence 37-74% and 26-55% respectively.

Table 3: Incidences of metabolic and other disorders in dairy animals of study area

S/No	Diseases	Indigenous	Crossbred	Buffaloes
1.	Milk fever	2.21	3.65	1.23
2.	Mastitis	5.15	7.29	2.78
3.	Udder Oedema	10.29	16.67	8.64

(All the values are in percentage)

In case of calf diseases, rates of occurrence of calf mortality, pneumonia and ectoparasitic infestation were highest in buffalo calves as 26.92%, 26.92% and 40.38% respectively and occurrence rates of naval ill and calf scour were highest in crossbred calves as 21.15% and 26.92% respectively.

Table 4: Incidences of various calf diseases in calves of the study area

S/No	Diseases	Indigenous	Crossbred	Buffaloes
1.	Calf mortality	13.64	16.67	26.92
2.	Navel ill	15.91	22.92	21.15
3.	Calf scour	27.27	29.17	26.92
4.	Pneumonia	20.45	25.00	26.92
5.	Ectoparasitic infestation	34.09	29.17	40.38

(All the values are in percentage)

Indigenous Traditional Knowledge (ITKs) Used by Dairy Farmers

Indigenous traditional knowledge is the local knowledge that is unique to a particular culture or society where it passes from generation to generation. It is the knowledge that people have gained through inheritance from their ancestors. Here, we are concerned with the knowledge of responding farmers regarding preventive measures and treatment of various diseases in dairy animals during transition period. These practices can also be covered under existing healthcare practices followed by the farmers. The table 5 reveals different types of indigenous traditional knowledge possessed by the dairy farmers in the study area. It was observed that the respondents use jaggery and water solution mostly for expulsion of foetal membrane. Apart from practicing of feeding methi (*Trigonella foenumgraecum*) and jaggery were also followed by most of the respondent. Metritis, which is termed as the inflammation of uterus in dairy animals. Dairy farmers use their traditional knowledge to counter the disorder by feeding Samudrijhaga and Kashiphal (*Curcurbit moschotopoir*) in appropriate proportion.

Table 5: Existing healthcare practices followed for treating aliments by respondents

Diseases	S/No	Practices, their ingredients and dosages	Durations
Retention of foetal membranes (RFM)	1.	Jaggery (500 g) mixed in 2 litre	Twice a day for 2 days
	2.	500 g grinded methi (*Trigonella foenumgraecum*) and 500 g jaggery were mixed and divided in two doses	Twice a day for 2 days
	3.	Neem (*Azadirachta indica*) leaves paste (100 g)	Once for 2 days
	4.	Barlay (*Hardeum vulgare*) grain (0.5 kg) along with jaggery (500 g) and divided in two doses	Twice a day for 2 days
Metritis	1.	100 g of Samudrijhaga soaked in water overnight	Once for 2 days
	2.	5 seeds of Kasiphal (*Curcurbit moschotopoir*) were finely crushed and mixed with 250 g Jaggery	Once for 2 days
Mastitis	1.	Spraying of hing decoction (*Ferulaas afoetida*) over the teats	Once for 3 days
	2.	50 g of Rash kapur along with one banana were mashed	Once for 2 days
Milk fever	1.	Decoction of 500 g Gud + 100 g Ajwain (*Trachyspermum ammi*) was prepared in 2 litre of water	Twice for one day
	2.	50 g of lahasun (*Allium sativum*) was grinded and paste was fed.	Once for one day
Prolapse	1.	100 g Satyanasi (*Argemone mexicana Linn*) seed and 250 g jaggery and make bolus in ghee/ oil	Twice for 2 days
	2.	100 g Lajwanti (*Mimosa pudica Linn*) seeds were grinded	Once for 2 days
	3.	100 g mishri, 500 g basan and 100 g ghee were mixed	Once for 2 days

Chand *et al*. (2021) revealed that majority of farmers fed boiled methi grain to dairy animals in morning (empty stomach) at the rate of one kg for five days for correcting the case of late maturity and anoestrus. At the same time a handsome number of farmers were feeding bajara with jiggery, and bajara with guar. Sharma *et al.* (2019) stated that for treatment of repeat breeding some livestock owners fed 250 gm overnight soaked ajwain (*Trachyspermum ammi*) to animal for five days. To counter the milk fever in dairy animals it was seen that the respondent's practices usage of giving decoction of 500 g Gud + 100 g Ajwain (*Trachyspermum ammi*) was prepared in 2 litre of water to dairy animals. In case of Prolapse, it was seen that Satyanasi seed and jaggery preparation was used. Apart from this they also feed Lajwanti (*Mimosapudica Linn*) seeds and Chiyasupari to the animal.

For control of disorders in calf majority of them uses the feeding of butter milk with salt to calf, followed by feeding of neem paste prepared from neem leaves to counter calf scour.

Table 6: Existing healthcare practices followed for treating calf diseases

Calf scour	1.	Small quantity of Salt was added to 250 ml of Butter milk	Twice for 2 days
	2.	50 gmneem (*Azadirachta indica*) leaves paste was prepared and fed.	Once for 2 days
Pneumonia	1.	100 g jaggery, 50 g ajwain (*Trachyspermum ammi*) were mixed	Twice for 2 days
	2.	50 gm of rash kapur was crushed mixed with gud and fed.	Once for 2 days

It was also observed that to control calf pneumonia a mixture of jaggery, ajwain and bedoma was used by the respondents. Cooked roots of *Dipsacus inermis* (Pilha) are also used to cure prolapse of uterus (Khan et al., 2021). Sarswat and Purohit (2020) stated that livestock owners used *Mytrus communis* for the treatment of Prolapse of uterus and *Nigella sativa, Pedalium murex* for the treatment of puerperal and uterine diseases.

Conclusion

From the present study it can be concluded that the result shows that the incidence of RFM was highest in crossbreed animal followed by buffalo and indigenous animals. The incidence of prolapse was highest in the buffalo (7.41%). The results of metabolic disorder incidence reveal that the occurrence of milk fever was 2.21, 3.65 and 1.23 in indigenous, crossbreed and buffalo respectively. It was further seen that the occurrence of mastitis is highest in crossbreed animals. Thus it can be concluded that measures should be adopted for better management of transition period among farmers. Specialized trainings and workshops arranged at village level can enhance the knowledge of the farmers regarding improved practices as well as the productivity of the animals which is possible only through proper extension services. Specially tailored programmes for the awareness of the farmers through government/ non- government initiatives can definitely improve the conditions.

Conflict of Interest

The authors don't have any conflict of interest for the publication

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Contribution by Authors

Equal contribution. All authors declared that 'written informed' consent was obtained from the approved parties for the publication of this article and accompanying images.

Conflict of Interests

There is no conflict of interest.

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