PREVALENCE OF SUBCLINICAL KETOSIS IN WESTERN RAJASTHAN[#]

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ABSTRACT

Dairy farming is a business that people engage for financial gain. Diseases in farm animals have a significant economic impact on livestock production. This paper presents to find out the prevalence of subclinical ketosis in dairy cows of western Rajasthan. The subclinical ketosis was diagnosed on the basis of plasma BHBA and NEFA levels during post-partum period. The overall prevalence of subclinical ketosis was recorded as 23. 57 per cent. The prevalence was highest in Pali-Marwar districts (28.08 per cent). The prevalence of subclinical ketosis is high comparatively literature cited due to non-scientific feeding.

***Key words*:** Prevalence; subclinical ketosis, dairy cow

Introduction

The prevalence of animal diseases in the world has been reduced in the last four decades due to its economic importance; there are still some of the livestock diseases that cause reduction in production efficiency leads severe economic losses (Johnchristy and Thirunavukkarasu, 2006; Nagategize and Kaneene, 1985). Prevalence is a snapshot of the amount of a disease existing in a herd at a point in time. Prevalence is calculated by dividing the number of disease positive cows by the number of cows sampled at that point or period in time. Ketosis, a disease of heavy lactating animals, occurs during peak milk yield causing a great economic loss to the milk industry. Diagnosis of bovine ketosis at an early (subclinical) stage is a must to prevent the economic loss to the farmers in terms of reduced milk yield. Production diseases i.e. diseases associated with improper nutrition or management are common in dairy cows. Dairy cows suffer from negative energy balance (NEB) during the first week of lactation due to energy expenditure associated with milk production and limited feed intake, resulting in NEB, a high mobilization of lipids from body fat reserves and hypoglycaemia (Drackley, 1999; Bobe *et al*., 2004; Dokovic *et al*., 2011). Nutrition, age, heredity, body condition score (BCS), management and energy imbalance as various risk factors are possible causes of NEB, periparturient fatty liver and ketosis (Drackley, 1999; Bobe *et al*., 2004). The economic impacts of maladaptation are important and include increased risk of metabolic disease, reduced milk production, early removal from the herd, and poor reproductive performance. The present study was found out the prevalence of subclinical ketosis in dairy cows in western Rajasthan.

Materials and Methods

The subclinical ketosis was diagnosed on the basis of plasma BHBA concentration ($\geq$1.2 mmol/L) and NEFA concentration ($\geq$0.7 mmol/L) during post partum transition period, respectively along with the presence of other signs such as decrease in milk yield. Inappetence was not observed all subclinical ketotic animals. The sampling were carried out after approximately 4-5 hrs after feeding because just after feeding BHBA increase. For the present study, 123 dairy cows were selected in 3 districts (Bikaner, Jodhpur and Pali-Marwar) of western Rajasthan.

Results and Discussion

Based on the results of different biomarker (NEFA and BHBA values) of negative energy balance, prevalence for the subclinical ketosis was calculated.

District wise: The prevalence of subclinical ketosis in dairy cows of Bikaner, Jodhpur and Pali-Marwar districts was 25.42 (15/59), 19.51 (8/41) and 26.08 (6/23) per cent, respectively.

Parity-wise prevalence of subclinical ketosis was highest in above 5th parity (32.35 per cent), followed by 3rd to 5th parity (20.22 per cent). The incidences of SCK increased with age. The results of the present investigation were similar to Bihani (2001), Sharma (2006), Kumar (2011) who reported highest prevalence in 3rd and 4th parity. The prevalence of SCK and clinical ketosis were 13.9% and 3.4%, significant difference were observed between regions, but not in parity wise. The mean daily peak milk yield for clinical ketosis, subclinical ketosis and healthy cows in study were 28, 35 and 45 kg, respectively, suggesting a decline ranging from 22 to 38%, compared to the healthy cows (Samiei *et al.,* 2013). Sato *et al*. (2005) reported 34.7% SCK in Japan and 57.7% in Lithuania (Zilaitis *et al*., 2007), which were higher than our study.

SCK occurred at 5 days in milk (DIM), when 22.3% of cows had their first SCK-positive test. Peak prevalence of SCK occurred at 5 days in milk (DIM), when 28.9% of cows had a SCK-positive test (McArt *et al*., 2012).

Marjan and Saman (2011) reported the incidence rate of subclinical ketosis was 7.2% (per cent of cows with at least one positive test) in early lactation (0-70th day) period and the peak prevalence of subclinical ketosis occurred during the fourth week of lactation in Fars Province of Iran. The overall prevalence of subclinical ketosis was 6.9 per cent to 14.1 per

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Table 1:Prevalence rate of subclinical ketosis in crossbred cows in different district of western Rajasthan

Districts	No. of cows sampled	No. of SCK (Prevalence)
Bikaner	59	15 (25.42 %)
Jodhpur	41	8 (19.51 %)
Pali -Marwar	23	6(26.08 %)
Total	123	29 (23.57 %)

The chi square statistics is 0.5681. The P-value is 0.9665. No significant difference in prevalence of SCK was observed between different districts.

cent in the first two months of lactation (Andersson and Emanuelson, 1985; Nielen *et al*., 1994; Duffield *et al.,* 1998).

The overall prevalence of ketosis was 9.38 per cent in cows and 2.92 per cent in buffaloes, observed in Tamil Nadu.They further observed low prevalence of ketosis in cows of Erode and Coimbatore districts of Tamil Nadu (Thirunavukkarasu *et al*., 2010).

Garro *et al.* (2013) and Suthar *et al.* (2013) reported overall prevalence of 21.8 and 10.3 per cent, respectively in the dairy cows, using a threshold of >1.2 mmol/L for blood BHBA. However, our studies having higher prevalence rate as compared to above mentionedstudy. The major cause of higher prevalence may be non-scientific feeding and management practices adopted in the study area.

Duffield *et al.* (1998) reported an incidence of 59.00 per cent and 43.00 per cent using a cutoff threshold for BHBA concentration of 1200 and 1400 mmol/L, respectively. Similarly Asl *et al*. (2011) observed a prevalence of 63.00, 68.00 and 59.00 per cent during the week 2nd , 4th and 6th post-partum, out of which 30.00 per cent of cows were found positive in all of the 2, 4 and 6 weeks post-partum.

McArt *et al.* (2012) reported a prevalence of 28.70 per cent, 26.30 per cent and 40.80 per cent in cows with parity 1, 2 and above 3, respectively. Higher prevalence reported in their study was due to the bi-weekly sampling (McArt *et al.,* 2012 and Ospina *et al.,* 2010) during the first two months, which resulted in increase in the detection rate of SCK, as the median time from first SCK positive BHBA test to first test <1.2 mmol/ L was 5 days, (McArt *et al.,* 2012) which helped them in detecting more number of SCK cases.

Highest prevalence of subclinical ketosis was found in cows from greater than 5th parity in comparison to 3rd- 5th parity. Possible reason for that might be the active haemostatic mechanisms in the young dairy animal to cope up with the negative energy balance during the early lactation period. Similar to the present findings, number of research workers recorded that the prevalence of ketosis increases with the age and peak prevalence was observed between 3rd- 5th lactation (Overby *et al.,* 1974; Erb and Martin, 1978).

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