Acta Scientific AGRICULTURE (ISSN: 2581-365X)

Volume 8 Issue 3 March 2024

Research Article

Factors Affecting the Prevalence of Diseases in Crossbred Dairy Cattle in an Organized Farm

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DOI: 10.31080/ASAG.2024.08.1353

Received: August 23, 2023

Accepted: February 14, 2024

Abstract

In the organized dairy farm, incidence of respiratory diseases, reproductive diseases, GIT infection, non specific fever, abscess, lameness and wounds, parasitic infestation, metabolic disease and mastitis was 10.22, 11.26, 11.95, 12.99, 4.5, 17.5, 13.69, 7.62 and 10.22 per cent, respectively. The chi-square revealed highly significant ($P < 0.01$) differences amongst the frequency of diseases in cross-bred dairy cattle. There was significantly higher ($P < 0.01$) prevalence of diseases (60.49%) in Holstein-Friesian cross-bred cows out of total diseases in both the genetic groups. The incidence of diseases was found to be highest in S2 (Monsoon) season (35%), followed by S3 (Post-monsoon) (23%), S4 (Winter) (21%) and S1 (Pre-monsoon) (20%) season out of total cases of diseases. It can be concluded that Holstein-Friesian cross-bred cows were more prone to diseases and during monsoon season the occurence of diseases was highest in dairy cattle.

Keywords: Diseases; Prevalence; Dairy Cows; Cross-Bred

Introduction

Dairy cattle are integral part of agricultural system of India and have occupied a prominent place in rural life providing not only a subsidiary income and nutritional security but also a significant source of organic fertilizer. Out of 535.78 million numbers of livestock in India cattle population is 192.49 million [1]. As per the latest report the milk production in India has reached 130.58 million tons during the year 2022-23. Our country ranks first in milk production in the world since last 4 decades and growing steadily. However, the annual milk production of Assam is only 1.006 million tons with per capita availability of 78 gm/day [2]. Cattle are main milk producing bovine in Assam. A large amount of milk might have lost due to diseases. Their management should be improved to reduce the occurrence of such diseases. It is imperative to study the factors favouring the occurrence of diseases and to make some concrete strategies so that improvement of milk production and dairy sector can be achieved. There are very few authentic information available on the incidence of diseases in the organized dairy farm. Therefore, present study was carried out to observe the effect of genetic group, season and period on the incidence of diseases in an organized farm.

Materials and Methods

To investigate the prevalence of diseases; present work was carried out in the Department of Livestock Production and Management. Data pertaining to the incidence of diseases during the period 2007-2017 were collected from the organized Instructional Livestock Farm (Cattle) of College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati. Data were collected from various records maintained in the farm that included the diseases involving. The study material consisted of total 577 cases of incidences of diseases occurred in the farm viz., respiratory, reproductive, gastro-intestinal tract (GIT), non-specific fever, abscess, lameness and wounds, parasitic infestation (internal), metabolic diseases and mastitis. The prevailed diseases were expressed in percentage (%). The data were classified according to genetic groups, seasons and periods. There was two genetic groups such as Jersey crossbred (G1) and Holstein-Friesian crossbred cows (G2);

four seasons such as Pre monsoon (S1), Monsoon (S2), Post monsoon (S3) and Winter (S4) and two periods : 2007-2012 (P1) and 2012-2017 (P2). The data were subjected to Chi-square test for the disease prevalence and pair wise comparison was performed by test of proportion in MS Excel.

Results and Discussion

The incidence of various diseases has been furnished in table 1. It is revealed that out of total 577 cases of various diseases in the present study, respiratory diseases, reproductive diseases, GIT infection, non specific fever, abscess, lameness and wounds, parasitic infestation, metabolic disease and mastitis was 10.22, 11.26, 11.95, 12.99, 4.5, 17.5, 13.69, 7.62 and 10.22 per cent, respectively. The chi-square revealed highly significant (P < 0.01) differences amongst the frequency of diseases in cross-bred dairy cattle. Among the diseases the occurence of lameness and wounds was significantly higher (P<0.01) and it was followed by parasitic infestation. Out of the prevailing diseases, incidence of abcess was significantly less (P<0.01). This might be due to concrete floor in the dairy farm which causes ulcers, bruising, abrasion due to friction [3]. The foot and leg disorders causes lameness [4]. Most causes of lameness in cattle (70%-90%) involve hoof lesions. Lameness that does not originate from the hoof can be due to trauma, arthritis, muscular ruptures, and neurologic diseases [5].

Diseases	Number affected	Prevalence (%)	Chi square-Value
Respiratory Diseases	59	10.22^{A}	56.70**
Reproductive Diseases	65	11.26^{AB}	
GIT Infections	69	11.95^{ABC}	
Nonspecific fever/ Diseases	75	12.99^{BC}	
Abscess	26	4.50^{D}	
Lameness and Wounds	101	17.50^{E}	
Parasitic Infestation	79	13.69^{C}	
Metabolic Diseases	44	7.62^{F}	
Mastitis	59	10.22^{B}	
Total (%)	577	100	-

Table 1: Total incidence of diseases.

NB: **Highly significant (P < 0.01); Means with different superscripts within a column differ significantly.

Effect of period

From the table 2 below it was observed that a maximum disease was occurred during P1 (2007-12). The chi-square test revealed non-significant effect of period on the type diseases in the dairy herd. Apparently the diseases were higher during P1 than P2 (2012-17). It might be due to improvement of management during P2. In both the period incidence of lameness and wound was maximum. Floors and flooring surfaces are significant contributors to lameness in dairy cattle. Housing condition and hard floor predisposes to cow comfort [6]. Earlier reports on the prevalence of diseases under low and high stress environment was 21.87 and 33.43 percent, respectively [7].

Diseases	P1		P2		Chi-square Value
	No. affected	%	No. affected	%	
Respiratory Diseases	37	11.97	22	8.20	10.75^{NS}
Reproductive Diseases	39	12.62	26	9.70	
GIT Infections	43	13.91	26	9.70	
Nonspecific fever	37	11.97	38	14.17	
Abscess	9	2.91	17	6.34	
Lameness and Wounds	50	16.18	51	19.02	
Parasitic Infestation	39	12.62	40	14.92	
Metabolic Diseases	24	7.76	20	7.46	
Mastitis	31	10.03	28	10.44	
Overall (%)	309	53.55	268	46.44	2.91^{NS}

Table 2: Diseases according to periods.

^{NS}: Non-significant (P > 0.05).

Effect of genetic groups

The prevalence of diseases was significantly higher (P < 0.01) in G2 (60.49%) genetic groups (Table 3). However, various categorical diseases did not differ significantly due to genetic group. It was observed that parasitic infestation was higher in Jersey crossbred cows (G1), where as lameness and wounds were higher in Holstein-Friesian cows (G2). Significantly higher incidence of diseases in G2 might be due to poor adaptability in the hot humid climatic condition of Assam. In another research [8] reported a 33.2 percent incidence of mastitis and 24 percent incidence of lamness in Holstein cows. The previous workers [9] found higher incidence of milk fever in Jersey cows (14.78%) than Holstein Friesian cows (4.82%).

Effect of seasons

The season wise different disease incidence has been furnished in Table 4. The result of chi square revealed highly significant effect of season on incidence of diseases irrespective of genetic group and period. The incidence of diseases was found to be highest in S2 season, followed by S3, S4 and S1 season.

Diseases	G1		G2		Chi-square Value
	No. affected	%	No. affected	%	
Respiratory Diseases	23	9.91	36	10.43	4.33^{NS}
Reproductive Diseases	25	10.77	40	11.59	
GIT Infections	25	10.77	44	12.75	
Non-specific fever	30	12.93	45	13.04	
Abscess	12	5.17	14	4.05	
Lameness and Wounds	33	14.22	68	19.71	
Parasitic Infestation	35	15.08	44	12.75	
Metabolic Diseases	19	8.18	25	7.24	
Mastitis	26	11.20	33	9.56	
Total	228	39.51^{a}	349	60.49^{b}	25.37**

Table 3: Diseases according to genetic groups.

NB: $^{NS:}$ Non-significant (P > 0.05)

**Highly significant (P < 0.01).

Diseases	Seasons				Chi- square Value
	S1	S2	S3	S4	
Respiratory Diseases	8 (6.72)	21 (10.44)	17 (12.78)	13 (10.48)	45.08**
Reproductive Diseases	10 (8.40)	25 (12.43)	14 (10.52)	16 (12.90)	
GIT Infections	27^{a} (22.68)	26^{a} (12.93)	7^{b} (5.26)	9^{b} (7.25)	
Nonspecific fever	17 (14.28)	23 (11.44)	15 (11.27)	20 (16.12)	
Abscess	6 (5.04)	10 (4.97)	5 (3.75)	5 (4.03)	
Lameness and Wounds	19^{a} (15.96)	38^{b} (18.90)	27^{c} (20.30)	17^{a} (13.70)	
Parasitic Infestation	15^{a} (12.60)	30^{b} (14.92)	22^{c} (16.54)	12^{a} (9.67)	
Metabolic Diseases	6^{a} (5.04)	7^{a} (3.48)	12^{b} (9.02)	19^{c} (15.32)	
Mastitis	11 (9.24)	21 (10.44)	14 (10.52)	13 (10.48)	
Total	119^{a} (20.0)	201^{b} (35.00)	133^{c} (23.00)	124^{ac} (21.00)	30.47**

Table 4: Diseases according to seasons.

NB: Figures in the parentheses indicate percentage; Means with different superscripts within a row differ significantly and **Highly significant (P < 0.01).

Highest incidence of diseases during S2 season might be due to heavy rain-fall along with hot-humid condition and heat stress. The sciencetist [10] reported that higher occurrence of diseases was found in summer season (28.5%) compared to rainy (23.8%), winter (26.2%) and spring (22.7) and values differed significantly (p < 0.05) in dairy calves. They concluded that summer season was more susceptible to diseases than other seasons.

Other workers [11] said that heat stress had deleterious effects on fertility and causes reproductive diseases and disorders in dairy cows in tropical and sub-tropical countries. It has been known that along with other stressors, heat stress could induce several physiological changes in animals [12,13].

Conclusion

In the organized dairy farm respiratory diseases, reproductive diseases, GIT infection, non specific fever, abscess, lameness and wounds, parasitic infestation, metabolic disease and mastitis were

prevailed to the tune of 10.22, 11.26, 11.95, 12.99, 4.5, 17.5, 13.69, 7.62 and 10.22 percent, respectively. Significantly higher ($P < 0.01$) prevalence of diseases was found in Holstein-Friesian Crossbred cow and during monsoon season. It can be concluded that Holstein-Friesian crossbred cows were prone to diseases more in the prevailing hot humid condition and so, necessary preventive measures are very essential particularly during monsoon season to optimize the production and welfare of high yielding dairy cows.

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