CALF MORTALITY AND ITS POSSIBLE CAUSES IN CHATTOGRAM DISTRICT OF BANGLADESH

A production report submitted in partial of the requirement for the fulfillment of the degree of Veterinary Medicine (DVM)

A Production Report Submitted by

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Session: 2017-18

Faculty of Veterinary Medicine

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August 2023

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A production report submitted as per approved styles and contents

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August 2023

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FMD = Foot and Mouth Disease

LSD = Lumpy Skin Disease

HS = Haemorrhagic Septicemia

Para TB = Para Tuberculosis

SD = Standard deviation

SEM = Standard error of mean

Acknowledgement

All praises are due to "Allah" who has created everything of the nature and who enable me to complete this study. I feel great pleasure to express my deepest sense of gratitude and indebtedness to my supervisor, Md. Emran Hossain, Professor, Department of Animal Science and Nutrition, Chattogram Veterinary and Animal Sciences University, for his scholastic guidance, valuable suggestion, constant inspiration and encouragement throughout the entire period of my study.

I would like to express my deep sense of gratitude and thanks to Professor Mohammad Lutfur Rahman, Dean, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University, and Professor Dr. A. K. M. Saifuddin, Director of External Affairs, for setting up this type of research work as a required component of the internship program.

The last acknowledgement and expression of thanks go to my loving family, who helped me along the way. They also continuously inspired me, and without their kind support.

Finally, I would want to thank everyone who contributed to the course and apologize for not mentioning each individual contributor individually.

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Abstract

In cattle production, calf mortality is a serious problem that has a negative impact on the economy, food security, and rural communities. This production report explores calf mortality and its causes in Bangladesh's Chattogram district, which is important to the country's livestock economy. The study shows that the first four weeks of a calf's life are the most crucial for survival through an investigation of management practices, environmental impacts, and health considerations. The risks of death are influenced by illnesses, poor diet, and inadequate housing. From January 2022 to July 2023, surveys were conducted on a variety of dairy farms around the district to gather information on calf death rates, disease prevalence, and age-related effects. In addition to identifying farms with various mortality rates, the analysis looked at changes in disease patterns over the course of the two years. Notably, mortality rates for ailments like LSD and diarrhea decreased, perhaps as a result of efficient preventive efforts, but rates for illnesses like parasitic infections and abortion showed rising mortality rates. The fragility of younger calves is highlighted by the fact that calves aged 1-3 months regularly experienced higher mortality than those aged 4-6 months. In order to lower calf death rates, the study emphasizes the necessity of better management techniques, disease control strategies, and addressing environmental concerns. This thorough understanding can help livestock producers in Chattogram improve calf health, animal welfare, and overall operational sustainability, enhancing both food security and the region's livestock industry's economic stability.

Introduction

Calf mortality has become a major issue in livestock farming because it can have a negative impact on food security and people's livelihoods in rural areas. A financial loss and genetic loss result from calf death on every dairy and breeding farm (Islam et al 2006). In Bangladesh, the importance of understanding the causes of calf mortality is especially important in the Chattogram area, which is a major part of the country's livestock industry.

The study will provide a complete picture of the issue through a thorough analysis of management techniques, environmental factors, and health considerations. The first four weeks of a calf's life are when they are most at risk of dying (Agerholm et al., 1993). The health of calves can be harmed by a variety of diseases and infections, such as parasite infestations, digestive issues, and respiratory infections. These issues can become more severe in the absence of reliable vaccinations and preventative actions. The most frequent causes of newborn death are pneumonia and diarrhea (Agerholm et al., 1993). The immune systems of calves can be weakened and their susceptibility to disease increased by inadequate nutrition and poor feeding techniques. A decline in general health may be caused by insufficient availability to wholesome food and clean water. Stress can reduce a calf's resilience and increase its susceptibility to infections. Harsh weather, severe temperatures, and poor shelter can all do this. Calves' survival and health may be impacted by genetic variables. Higher mortality rates may be a result of breeding procedures that do not account for genetic susceptibility to specific diseases or flaws. Higher calf mortality can be caused by poor management techniques used during the calving and post-calving periods, such as poor hygiene, inadequate neonatal care, and delayed veterinarian assistance.

This production report's goal is to give a thorough investigation of calf mortality and its possible causes. Producers can employ measures that result in healthier calves, higher animal welfare, and a more dependable livestock operation by developing a deeper understanding of the forces at work.

Materials and Methods

Study area

The study was conducted in a dairy farms at Patiya upazila, Boalkhali upazila, Karnafuli upazila, Patenga, Chawkbazar, Chaktai and Fouzdarhat area in Chattogram district, Bangladesh from January 2022 to July 2023. A descriptive cross-sectional survey was conducted in this period. Insights on the procedures and dynamics of the dairy industry are provided by these places through a vast dataset obtained from dairy farms. The intricacies of dairy farming in urban and rural settings are covered in this dataset, from the bustling commercial district of Chawkbazar to the tranquil countryside of Patiya, Boalkhali, and Karnafuli Upazilas. The inclusion of the regions of Patenga, Chaktai, and Fauzdarhat also offers a coastal viewpoint, perhaps highlighting unique challenges and opportunities faced by dairy farmers in these regions.

Data collection

A structured questionnaire and survey methodology were created, to achieve specific objectives. The verbal consent of the respondents was sought after an explanation of the interview's objectives. Finally, the questionnaire was improved and updated while it was out in the field using the comments and suggestions of the responders. Data are also collected from the farm register. Twenty different farm statistics were obtained, including the number of cattle, their weight, the number of calves, the number of dead calves, the age of the dead calves, the age of the living calves, the average milk output, the feeding, the housing system, the vaccinations, and the deworming.

Data analysis

Raw data were collected and compiled into Microsoft Excel-2013. Then the data were analyzed in STATA 13. Descriptive analysis was performed. The mean, standard error, standard deviation, p value were calculated and interpreted accordingly. At the P≤0.05 level, all statistical tests for significance were conducted.

Results

Farm-Wise Mortality

Table 1. Farm wise calf mortality comparison between 2022 and 2023

Name of the farm	Calf mortality % (2023)	Calf mortality % (2022)
Molla Dairy Farm	11.11	0
Anjuma Dairy Farm	4.17	3.57
Ms. Abdul Kader Dairy farm	0	16.67
Nargis Dairy Farm	50	0
Haque Dairy & Agro	60	10.53
Habib Dairy & Agro	41.67	27.27
Khatun Dairy Farm	100	80
Kutub Dairy Farm	33.33	16.67
Abdul Kuddus Dairy Farm	60	55.56
Mannan Dairy Farm	33.33	0
Shahgodi Dairy Farm	13.33	31.25
Hossen Dairy Farm	10	9.09
Shah Amanat Dairy farm	0	3.70
Chowdhury Agro	21.43	0
Azizia Dairy Farm	0	22.22
Belal Dairy farm	50	33.33
Eva Dairy Farm	8.33	33.33
Bandhan Dairy Farm	50	0
Moin Dairy Farm	25	20
Liza Dairy Farm	21.43	8.33
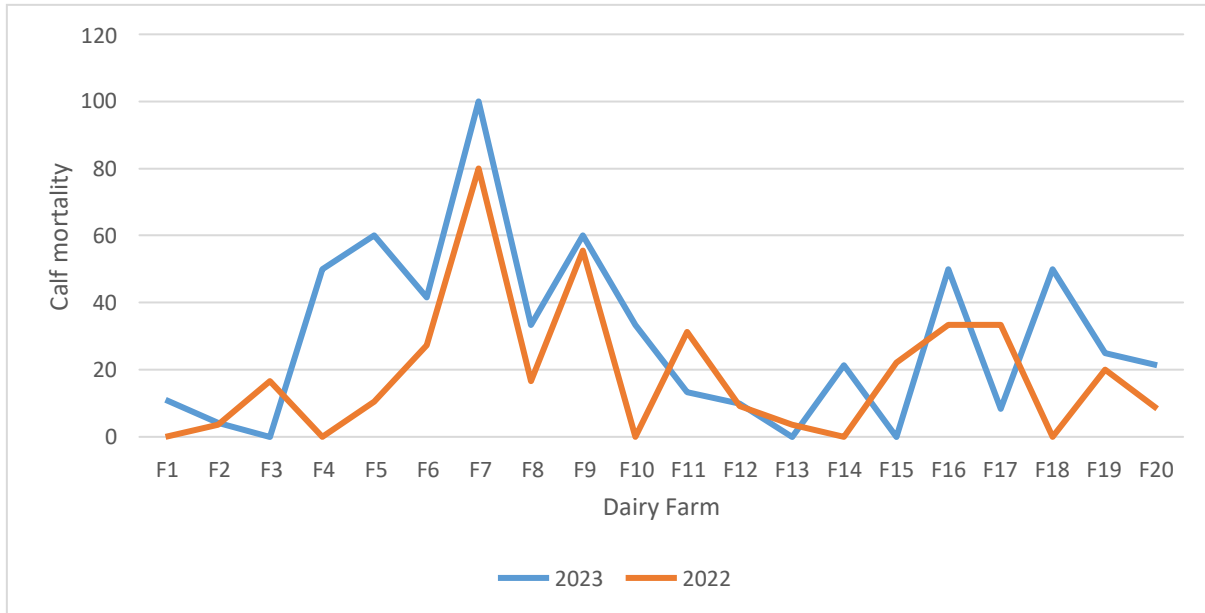
Figure 1. Lines showing comparison between calf mortality of 2022 and 2023 in different dairy farms

From the above mentioned table it is seen that Khatun Dairy Farm remains constant of being the farm with high calf mortality rate. In 2022, the percentage was 80 while the next year it became 100%. It indicates very poor management system of that farm causing downfall. Calf mortality across other dairy farms showed a variety of diverse trends. While some farms saw reductions in calf death rates, others saw increases. These discrepancies were probably caused by a number of factors, including managerial techniques, healthcare, and environmental factors. Farms with higher calf mortality rates should think about developing techniques to enhance calf health and lower mortality. If we do the comparison year wise it is evident that 2023 has the highest calf mortality rate than 2022. During interviewing the farm owners, they answered the climate change and flood to be the main factor behind the increase of calf deaths.

Disease-wise mortality

Table 2. Disease wise mortality of calf in 2023

Disease	Mortality %
Pneumonia	10.20408
Abortion	12.2449
FMD	14.28571
LSD	16.32653
Diarrhoea	18.36735
Parasite	14.28571
HS	2.040816
Para TB	2.040816
Rain and Flood	10.20408

Table 3. Disease wise mortality of calf in 2022

Disease	Mortality%
Pneumonia	5.263158
Abortion	2.631579
FMD	10.52632
LSD	31.57895
Diarrhoea	31.57895
Parasite	5.263158
HS	2.631579
Dysentery	5.263158
Navel ill	5.263158
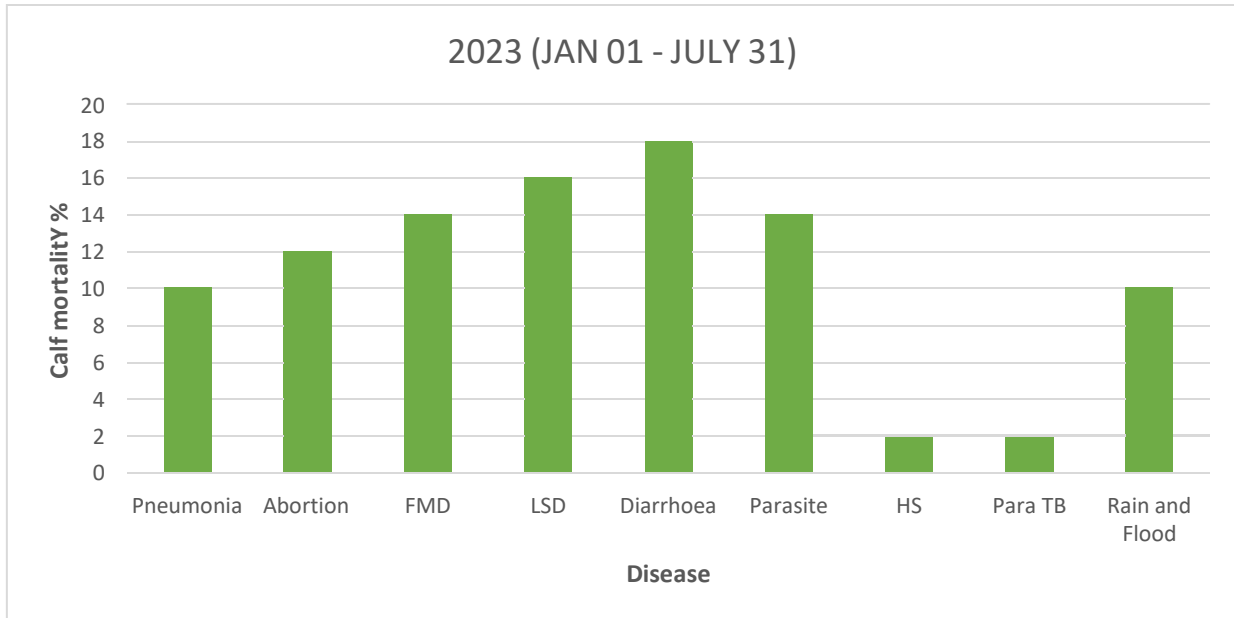
Figure 2. Graph showing calf mortality percentage due to different disease in 2023
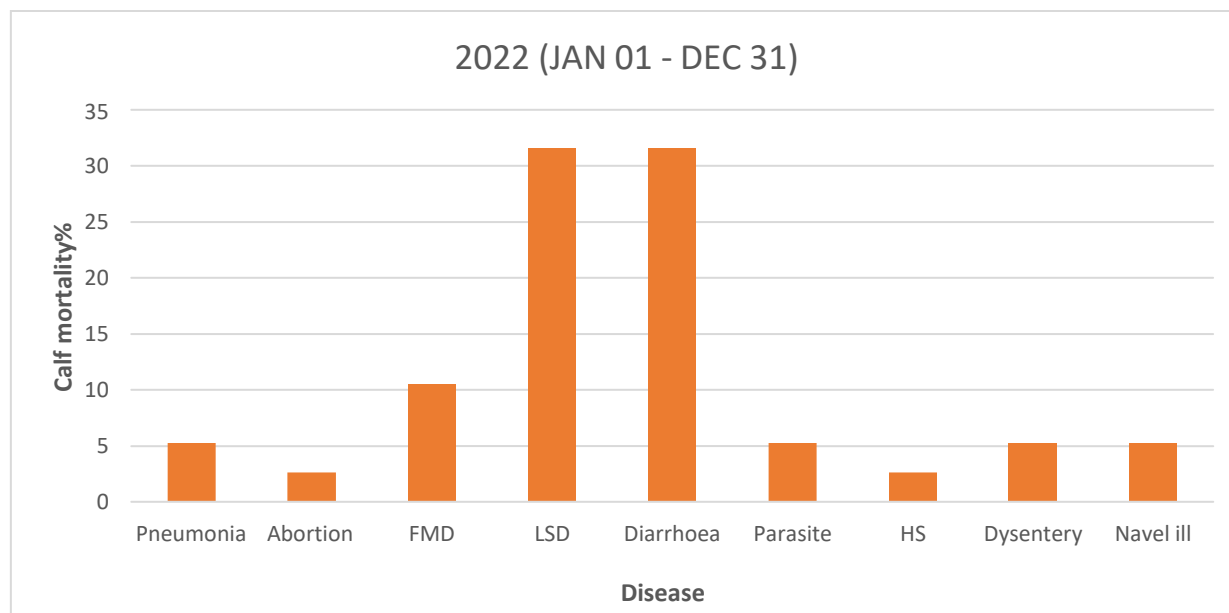
Figure 3. Graph showing calf mortality percentage due to different disease in 2022

Between 2022 and 2023, there were considerable changes in disease-related calf mortality, according to the comparison analysis. Significant increases in mortality were observed for diseases such parasitic infection and abortion, indicating new difficulties in disease control. On the other hand, the decline in death rates for LSD and diarrhea suggests that preventive efforts may be effective. The rise in mortality from pneumonia emphasizes the need for focused treatments to treat respiratory disorders. Similar to how external factors like rain and flooding contribute to calf mortality, managing environmental risks is crucial.

Effect of age on calf mortality

Table 4. Effect of age on calf mortality in 2023

	Mean±SD		SEM		P value	
	Dead	Alive	Dead	Alive	Dead	Alive
1-3month	1.75±1.650359	4.75±4.832728	0.3690314	1.080631	0.0393	0.3277
4-6month	0.7±1.454575	3.55±2.438183	0.3252529	0.5451943		

Table 5. Effect of age on calf mortality in 2022

	Mean±SD		SEM		P value	
	Dead	Alive	Dead	Alive	Dead	Alive
1-3month	1.45±1.700619	5.95±4.430457	0.38027	0.9906803	0.0294	0.3573
4-6month	0.4±1.187656	3.55±2.870448	0.2655679	0.6418518		

Calves aged 1-3 months often have a greater mortality rate than those aged 4-6 months in both years. Younger calves may be more susceptible to mortality risks, according to this pattern. In table 4. p-value in case of dead animal is less than 0.05. So the effect of age in death of calf is significant. It is also same in case of table 5. Again in table 4 and 5 the p-value of live animal is higher than 0.05. That means effect of age is not significant in case of live animal.

Discussion

Farm-wise mortality

Our study identified fluctuating mortality rate in different dairy farms. This indicates different management practices in those farms. We found that environmental factors such as rain and flood also effected the mortality rate this year. It's crucial to take into account variables like the size of the farms, the breeds of calves, and any modifications to management procedures in order to reach more accurate conclusions. Deeper understanding of the reasons of fluctuations in calf mortality may result from more research into these aspects.

Disease-wise mortality

The dynamic variation in disease patterns between the two years is the standout finding from the comparison of disease-related calf mortality. Significant increases in mortality rates were seen for conditions like parasitic infections and abortion, indicating new difficulties with disease control measures. This change underscores the requirement for careful observation of disease patterns and ongoing modification of preventive and therapeutic strategies. Debnath et al. (1995) showed that FMD still significantly contributes to calf mortality after routine vaccination. In this report, it is also shown that mortality due to FMD increased after routine vaccination of most farm from where

data were collected. According to Stefaniak et al. (2004), newborn diarrhea was one of the major causes of calf morbidity and mortality. The death rates for illnesses including diarrhea and LSD were significantly declining, in contrast to the rising trends in some disorders. This decrease raises the possibility that the preventive measures taken are having a good impact. The decline in calf mortality rates for these particular diseases may have been facilitated by effective disease management techniques, such as vaccination guidelines, hygiene precautions, and dietary interventions. The rise in pneumonia death rates is a notable observation. Bhuller et al. (1985), Shimizu et al. (1987), Islam et al. (2005) stated that higher proportion of calves died by pneumonia. The surge in calf fatalities from pneumonia highlights the need of managing respiratory health. Given that respiratory problems can quickly and severely affect calf health and general productivity, targeted therapies for respiratory illnesses should be prioritized. The impact of outside factors on calf health is clearly highlighted by the comparison of disease-related mortality rates. The addition of "Rain and Flood" as a cause of calf death highlights the importance of environmental risks in the spread of disease and the welfare of calves. In order to prevent and reduce disease, it is crucial to address environmental dangers.

Effect of age on calf mortality

According to the results from both years, calves that are 1-3 months old consistently have greater mortality rates than their counterparts that are 4-6 months old. This recurrent pattern is consistent with the management of calves as a whole and emphasizes the vital role of the neonatal stage as well as the vulnerability of younger calves to various stressors. The results are given more rigor by the statistical analysis, which is seen in the p-values. The p-values for dead animals in 2022 and 2023 are less than 0.05, highlighting the statistical relevance of age as a factor in calf mortality. This emphasizes the constancy and dependability of the observed age-mortality association.

Conclusion

This production report concludes with a thorough analysis of calf mortality and its underlying causes in the Chattogram region of Bangladesh. A major problem for livestock husbandry is calf mortality, which affects food security, livelihoods, and economic sustainability. This study provides light on the complex factors impacting calf mortality by a thorough review of

management practices, environmental factors, and health issues. Overall, the study's findings show how closely management techniques, health issues, and environmental factors interact to affect calf mortality rates. The study emphasizes the need for creating thorough plans to improve calf health, lower mortality, and guarantee the sustainability of livestock businesses. For overall food security and economic stability, reducing calf mortality becomes even more important because the Chattogram region continues to be a vital hub of the nation's cattle economy. Dairy farmers in the Chattogram region may contribute to the production of healthier calves, improve animal welfare, and increase the profitability of their livestock operations by developing a deeper understanding of the underlying causes of calf mortality and putting evidence-based solutions into practice. The cattle industry's stakeholders can use this production report as a useful tool to support decision-making and push practical solutions to the problems caused by calf mortality

References

Agerholm, J. S., Basse, A., Krogh, H. V., Christensen, K., & Rønsholt, L. (1993). Abortion and calf mortality in Danish cattle herds. *Acta Veterinaria Scandinavica*, *34*, 371-377.

Bhullar, M. S., & Tiwana, M. S. (1985). Factors affecting mortality among buffalo-calves. *Indian Journal of Animal Sciences (India)*.

Debnath, N. C., Taimur, M. J. F. A., Saha, A. K., Ersaduzaman, M., Helaluddin, M., Rahman, M. L., ... & Islam, M. A. (1995). A retrospective study of calf losses on the central dairy cattle breeding station in Bangladesh. *Preventive Veterinary Medicine*, *24*(1), 43-53.

Islam, S. K. M. A., Hoque, M. A., Alam, M. R., Hassan, M. M., & Rahman, M. A. (2006). A cross-sectional study on production performance of stall fed dairy cattle at Central Cattle

Breeding Station (CCBS), Savar, Dhaka. *Bangladesh Journal of Veterinary Medicine*, *4*(1), 61-63.

Islam, S. S., Ahmed, A. R., Ashraf, A., Khanam, N., & Ahmed, M. B. (2005). Causes and consequences of calf mortality in a dairy farm of Bangladesh. *Journal of Animal and Veterinary Advances*, *4*(2), 260-264.

Shimizu, T., & Nagatomo, H. (1987). Current status of calf diseases in Japan. *Bulletin of the Faculty of Agriculture-Miyazaki University (Japan)*.

Stefaniak, T. 2004. "Diarrhea is the Enemy No. 1." *Breed with the Head* 6: 31-41. (in Polish)

Biography

I am Rakibul Alam Prachurja, son of Md Badiul Alam and Parvin Akther. I was born in Nimtola, an area of Chattogram district. I passed my Secondary School Certificate (SSC) examination from Hatey Khari School and College, Chattogram in 2015 and Higher Secondary Certificate (HSC) examination from Govt. Cambrian College, Chattogram in 2017. I enrolled for Doctor of Veterinary Medicine (DVM) degree in Chattogram Veterinary and Animal Sciences University (CVASU), Chattogram, Bangladesh in 2017-2018 session. In the near future, I would like to work and have interest in research field in epidemiology.