



Seasonal Changes in Deaths by Categories and Their Causes in Dairy Cattle in the Province of Camagüey, Cuba

María Lucía Pérez-Castro Basulto *, José Alberto Bertot Valdés **, Roberto Vázquez Montes de Oca **, Godofredo Ramón Garay Alvarez **

*Ministry of Agriculture. Provincial Office, Camaguey, Cuba.

**The Ignacio Agramonte University of Camaguey.

Correspondence: maluвет0019@gmail.com

Received: September 2024; Accepted: September 2024; Published: October 2024.

INTRODUCTION

The death of a dairy cow is always a financial loss for a farmer and potentially, a welfare issue that must be addressed within the dairy industry (Sarjokari *et al.*, 2018). In recent decades, there has been a noticeable, persistent, and concerning increase in the mortality of dairy cows (McConnel and Garry, 2019).

According to the results collected by the National Office of Statistics and Information of Cuba (ONEI) in the 2020 Statistical Yearbook, 165.7 thousand heads of cattle died in the country that year, representing 4.4% of the total population; of these, 41.4 thousand were from the province of Camagüey, which accounts for the high rate of 24.9% of all deaths in the country. The main causes of death were malnutrition, gastrointestinal disorders, accidents, and respiratory disorders.

There is not much information from studies dedicated to the analysis of cattle mortality, so the aim of this work focuses on evaluating possible seasonal changes in deaths by categories and their causes due to the effects of prolonged drought periods and the spontaneous displacement of calving patterns depending on the availability of pastures.

DEVELOPMENT

Based on the monthly data between January 2016 and December 2021 from the archives of the Animal Health Department at the Provincial Office of the Ministry of Agriculture in Camagüey, Cuba, exploratory time series analyses were performed on cattle deaths by category (cows,

Citations (APA) Seasonal Changes in Deaths by Categories and Their Causes in Dairy Cattle in the Province of Camagüey, Cuba (2024). *Journal of Animal Prod.*, 36(2). <https://apm.reduc.edu.cu/index.php/rpa/article/view/e153>



©The author(s), the Journal of Animal Production, 2020. This article is distributed under the terms of the international license Attribution-NonCommercial 4.0 (<https://creativecommons.org/licenses/by-nc/4.0/>), assumed by collections of open access scientific journals, recommended by the Declaration of Budapest, which may be consulted at Budapest Open Access Initiative's definition of Open Access.

heifers, adult males, yearlings, calves) and their causes (malnutrition, accidents, gastrointestinal disorders, and respiratory disorders) and the seasonal decomposition process with an additive model. The criterion used to consider a significant seasonal variation was $\pm 10\%$. All statistical analyses were performed using IBM® SPSS® Statistics version 24.

Between February and July, an increase in the death rate for all categories was observed (Table 1), with May being the most affected month, particularly for cows and heifers.

Table 1 Seasonal factors causing deaths by categories

Period (month)	Seasonal factors (%)					
	Cows	Heifers	Calves	Yearlings	Adult Males	Total deaths
1	62.9	67.1	113.6	111.7	81.8	91.7
2	89.4	95.9	135.2	136.8	81.6	111.2
3	122.5	104.1	128.8	146.3	112.6	127.7
4	146.2	134.3	110.2	131.9	130.9	130.0
5	184.6	148.3	106.7	126.0	132.5	138.7
6	149.3	138.9	90.1	87.0	109.9	110.5
7	95.3	98.1	69.1	73.7	95.0	84.4
8	76.5	77.1	69.0	60.6	84.9	71.7
9	73.3	84.1	75.5	70.8	84.1	74.7
10	75.5	92.0	92.6	82.2	112.9	89.6
11	59.2	76.5	95.8	75.2	81.7	78.7
12	65.4	83.7	113.5	97.8	92.2	91.2

Malnutrition was the cause that showed the greatest seasonality (Table 2). Between February and May, there is a significant increase in the death rate due to this cause.

Table 2. Seasonal factors causing deaths by categories

Period (month)	Seasonal factors (%)			
	Malnutrition	Accidents	Respiratory disorders	Gastroenteric disorders
1	95.7	66.8	111.6	97.4
2	135.8	76.2	105.9	110.8
3	176.2	100.9	102.4	105.1
4	187.1	95.5	98.0	96.9
5	194.0	123.3	110.2	113.8
6	115.6	121.1	98.9	97.4
7	61.5	107.6	81.2	94.4
8	36.9	104.0	70.6	79.4
9	33.3	104.8	72.2	74.4
10	49.7	121.2	120.2	104.5
11	48.0	93.4	105.3	103.1
12	66.4	85.2	123.4	122.7

The results show the effect of seasonality, as the highest number of deaths in all categories was recorded during the drought months. In Cuba, climate change has altered the calving patterns of animals in response to heat stress, as well as the quality and quantity of pasture (Bertot Valdés *et al.*, 2019). According to Gauly and Ammer (2020), these conditions result in higher mortality rates, impaired immune systems, disease spread, reproductive issues, and decreased milk

production. Therefore, it is essential to implement mitigation and adaptation strategies that improve breeding, management, nutrition, and genetics to achieve long-term sustainable solutions.

CONCLUSIONS

For the first time in the province of Camagüey, seasonal mortality patterns have been detected in dairy herds, with malnutrition identified as the main cause of deaths. Significant increases were observed during the spring months, primarily affecting cows and calves.

REFERENCES

- Bertot Valdés, J. A., Mendoza Rodríguez, I., Horrach Junco, M. N., Vázquez Montes de Oca, R., Garay Durba, M., Soto Senra, S., & Avilés Balmaseda, R. (2019). Patrón estacional de los nacimientos en ganado lechero durante el período 1982-2017 en Camagüey, Cuba. *Revista de Producción Animal*, 31(3), 10-18. <http://scielo.sld.cu/pdf/rpa/v31n3/2224-7920-rpa-31-03-10.pdf>
- Gauly, M. & Ammer, S. (2020). Review: Challenges for dairy cow production systems arising from climate changes. *Animal*, 14(S1), s196-s203. <https://doi.org/10.1017/S1751731119003239>
- McConnel, C. S., & Garry, F. B. (2019). Invited Review: Why cows die in US dairy herds. *Applied Animal Science*, 35(6), 596-605. <https://doi.org/10.15232/aas.2019-01926>
- Oficina Nacional de Estadísticas e Información (ONEI). República de Cuba. Anuario Estadístico (2020). La Habana. <https://www.onei.gob.cu/agricultura>
- Sarjokari, K., Hovinen, M., Seppä-Lassila, L., Norring, M., Hurme, T., Peltoniemi, O. A. T., ... & Rajala-Schultz, P. J. (2018). On-farm deaths of dairy cows are associated with features of freestall barns. *Journal of dairy science*, 101(7), 6253-6261. <https://doi.org/10.3168/jds.2017-13420>

AUTHOR CONTRIBUTION STATEMENT

Research conception and design: MLCB, JABV, RVMO, data analysis and interpretation: JABV, RVMO, redaction of the manuscript: MLCB, JABV, RVMO, GGA.

CONFLICT OF INTEREST STATEMENT

The authors state there are no conflicts of interest whatsoever.