



Mini Review

Volume 24 Issue 3 - June 2020
DOI: 10.19080/ARTOAJ.2020.24.556271

Agri Res & Tech: Open Access J

Copyright © All rights are reserved by Antônio Amaral Barbosa

Hematological and Feeding Behavior in Lame Dairy Cows



Antônio Amaral Barbosa*, Gabriela Bueno Luz, Laura Valadão Vieira, Ana Paula Schmidt, Viviane Rohrig Rabassa, Francisco Augusto Burkert Del Pino, Josiane de Oliveira Feijó, Cássio Cassal Brauner, Carla Augusta Garcia, Leonardo Marinsl, Marcio Nunes Corrêa

Livestock Research, Education and Extencion center, Federal University of Pelotas, Rio Grande do Sul (RS), Brazil

Submission: May 12, 2020; Published: June 01, 2020

*Corresponding author: Antônio Amaral Barbosa, Livestock Research, Education and Extencion center, Federal University of Pelotas, Rio Grande do Sul (RS), Brazil, Avenue Juscelino Kubitshek, 3161, Pelotas, Brazil

Abstract

Foot disorders of dairy cattle are associated with low production rates and lead to losses that can reach up to 50% of the productive capacity. The objective of this work was to evaluate the feeding behavior and hematological profile of healthy and lameness dairy cows kept in the compost barn system. Eighteen multiparous Holstein cows, with daily milk production of 46.7 L were divided into two groups: nine animals that had a locomotion score (LS) 2 or more and sole hematoma and another group composed of nine healthy animals. The animals were followed for 10 days and was evaluated the food consumption, milk production and hematological profile. Lame cows presented hematocrit lower than healthy cows ($p=0.04$), being 26.4% and 27.7% respectively, and lower concentration ($p<0.05$) of total leukocytes ($7.96 \pm 0.63 \times 10.21 \pm 0.73$). Healthy animals presented greater concentration ($p<0.05$) of lymphocytes (4.25 ± 0.70) when compared with lameness cows (1.96 ± 0.60). The total daily food consumption was not affect by the health condition, however, when evaluated the milk production, lameness cows showed less milk production than the healthy animals. Thus reflecting, in this result, one of the many direct losses that lameness can bring into the milk production systems.

Keywords: Locomotion score, Leukogram, Milk production

Introduction

Changes in the locomotor system have increased significantly in recent years, since, currently, worldwide estimates of the prevalence of claudication vary from 20% to 55%, with sole hemorrhage being one of the most diagnosed injuries [1,2]. Foot disorders of dairy cattle are associated with low production rates and lead to losses that can reach up to 50% of the productive capacity. In addition, lameness is considered the most representative indicator of impaired welfare in dairy cows [3,4]. In this context, orthopedic disorders are a growing problem in dairy farming, so that understanding the behavioral and metabolic changes related to these events is extremely important within production systems. Thus, the objective of this work was to evaluate the feeding behavior and hematological profile of healthy and lameness dairy cows kept in the compost barn system.

Materials and Methods

Eighteen multiparous Holstein cows were evaluated, with daily milk production of 46.7 L, with approximately 80 ± 20 days in milking (DIM), allocated in compost barn, and milked twice a

day. The animals were separated into two groups, consisting of 9 animals that had a locomotion score (LS) 2 or more on a scale of 1 to 5 according to Phillips [5] methodology and sole hematoma in at least one limb; and another group composed of 9 healthy animals, these matched by DIM, milk production and number of lactations. The animals were followed for 10 days, being evaluated the food consumption by automatic and individualized feeders (Intergado, Minas Gerais, Brazil) and milk production of each animal during milking (DeLaval, São Paulo, Brazil). On the LS evaluation day, blood was collected from all animals for complete blood count. Data were analyzed using NCSS 2005 software (Number Cruncher Statistical Systems, Kaysville, Utah) through analysis of variance considering the group as a fixed factor, in which the animals were blocked in terms of milk production, days in lactation and number of lactations, and significant differences were considered when $p<0.05$.

Results and Discussion

The hematocrit of lameness animals was lower than that of healthy ($p=0.04$), being 26.4% and 27.7% respectively, differently

the results found by Marti et al. [6] when compared lame and non-lame cows. In our study, this results can be related to a possible dehydration, but not necessarily and directly with de claudication. Even though the values are within the physiological. The hematocrit corresponds to the percentage of erythrocytes in the blood and when associated with other components of the erythrogram and leukogram, it can be considered essential for assessing the nutritional status and detecting tissue and metabolic pathological changes in the animals [7]. In the leukogram evaluation, the lameness animals showed a low concentration of total leukocytes (7.96 ± 0.63), compared to healthy animals (10.21 ± 0.73) ($p < 0.05$). Leukopenia found in lame cows is believed to be related to leukocyte diversion to the lesion site. According to Cole et al. [8], in ruminants the hematological tests used for the diagnosis of inflammatory conditions, such as leukocyte count, offer limited information since many inflammatory processes do not produce an increase in leukocyte count and leukopenia is often observed initially due to migration of neutrophils to the "focus area" of the lesion.

In relation to the concentration of lymphocytes, a difference was found between the two groups, where lameness cows presented lymphopenia (1.96 ± 0.60), in relation to healthy animals (4.25 ± 0.70) ($p < 0.05$). Established lymphopenia may be related to the organism response to an acute phase inflammatory response, corroborating the results found by Kidd [9], where it was determined that in ruminants, in response to adrenal activity, in the acute phase, destruction of lymphocytes resulting in lymphopenia, a condition also observed by Borges et al. [7], in a study on leukocyte values of cattle with pododermatitis. In relation to the total daily food consumption, the lame animals showed a numerically greater intake of food (47.37 ± 1.77) compared to healthy animals (45.65 ± 2.16), with no statistical difference between groups ($p > 0.05$), different from that found by Melendez et al. [10], where they verified weight loss and less dry matter intake in lameness animals. However, despite the result found, when compared with the daily milk production of the groups, the claudicating animals showed less milk production than the healthy animals in both milking, with the average production of lameness cows being $21.02 \pm 0,66$ on the first milking of the

day and 20.98 ± 0.65 on the second and healthy cows of 22.34 ± 0.81 and 22.31 ± 0.81 , respectively. These results demonstrate that although lameness did not affect consumption, healthy cows were more efficient when evaluating the milk production of both groups. Thus reflecting, in this result, one of the many direct losses that lameness can bring into the milk production systems.

Conclusion

Food consumption was not affected by the health condition of the animals, however, when assessing the hematological profile, lameness cows showed lower hematocrit, lower concentration of total leukocytes and lower concentration of lymphocytes when compared to healthy cows.

Conflicts of Interest

The authors declare no conflicts of interest.

References

1. [https://www.vetfood.theclinics.com/article/S0749-0720\(17\)30020-8/abstract](https://www.vetfood.theclinics.com/article/S0749-0720(17)30020-8/abstract)
2. <https://wp.ufpel.edu.br/ppgveterinaria/files/2019/10/Ant%C3%B4nio-Amaral-Barbosa.pdf>
3. <https://www.sciencedirect.com/science/article/pii/S0022030201746425>
4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3003581/>
5. Phillips CJ (2010) Principles of Cattle Production. 2nd Ed. Cambridge University Press 75-129.
6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6285321/>
7. <http://200.137.217.156/bitstream/ri/144/1/valores.pdf>
8. Cole DJ, Roussel AJ, Whitney MS (1997) Interpreting a bovine CBC: evaluating the leukon and acute-phase proteins. The Veterinary Clinics of North America - Food Animal Practice 92(5): 470-478.
9. Kidd R (1991) Interpreting neutrophil numbers. Veterinary Medicine 86: 975-982.
10. https://www.sciencedirect.com/science/article/pii/S0093691X02011524?casa_token=TD6NmUtnTFgAAAAA:aryCURFoUeyk-JV5V9YdFDomSemuFBLlJ8umLNcFb7SqsxaGo6_0d-6EblwVcl51fUNs6YTGKoQ



This work is licensed under Creative Commons Attribution 4.0 License
DOI: [10.19080/ARTOAJ.2020.24.556271](https://doi.org/10.19080/ARTOAJ.2020.24.556271)

Your next submission with Juniper Publishers will reach you the below assets

- Quality Editorial service
- Swift Peer Review
- Reprints availability
- E-prints Service
- Manuscript Podcast for convenient understanding
- Global attainment for your research
- Manuscript accessibility in different formats
(Pdf, E-pub, Full Text, Audio)
- Unceasing customer service

Track the below URL for one-step submission
<https://juniperpublishers.com/online-submission.php>