RELATIONSHIP BETWEEN BODY CONDITION AND BOVINE CETOSE IN BREASTFEEDING COWS

(RELAÇÃO ENTRE ESCORE DE CONDIÇÃO CORPORAL E CETOSE BOVINA)

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RESUMO

Neste estudo foi realizado um levantamento em algumas propriedades localizadas no município de Francisco Beltrão – PR, e em 41 vacas pós-parto (8ª ao 70º dia de lactação) foi diagnosticado cetose bovina pela detecção de beta-hidroxibutirato (BHB) no sangue, e concomitantemente realizou-se a avaliação do escore corporal de cada animal (1 – 5). A cetose em bovinos é uma enfermidade metabólica que ocorre principalmente no pós-parto e causa perdas econômicas, pois há uma diminuição considerável na produção de leiteira, maior intervalo entre partos e desenvolvimento de doenças oportunistas. O escore corporal durante a prenhes e no pós-parto podem influenciar a ocorrência de doenças metabólicas, principalmente a cetose bovina, podendo apresentar-se tanto na forma clínica como subclínica. A avaliação realizada demonstrou que a maioria dos animais com cetose estavam com escore corporal 3, não havendo relação entre cetose subclínica e escore de condição corporal. Porém no momento no parto, estavam com 0,5 a 1 pontos a mais do que o atual, denotando sobrepeso, o que pode indicar uma relação com a enfermidade, o qual sugere mais pesquisar com mais índices de monitoramento para esclarecer esses resultados.

Palavras-chaves: doenças metabólicas, pós-parto, beta-hidroxibutirato.

ABSTRACT

In this study, a survey was performed on some properties located in the city of Francisco Beltrão - PR, and 41 cows (8th to 70th day of lactation) were diagnosed for beta-hydroxybutyrate (BHB) in the blood and 41 concomitantly the evaluation of the corporal

score of each animal (1 - 5). Ketosis in cattle is a metabolic disease that occurs mainly in the postpartum period and causes economic losses, as there is a considerable decrease in dairy production, longer interval between deliveries and development of opportunistic diseases. The body score during pregnancy and postpartum may influence the occurrence of metabolic diseases, mainly bovine ketosis, and may present both clinically and subclinically. The evaluation showed that the majority of animals with ketosis had body score 3, there was no relation between subclinical ketosis and body condition score. However, at the moment of childbirth, they were 0.5 to 1 points higher than the current one, indicating that it is overweight, which may indicate a relation with the disease, which suggests more research with more monitoring indexes to clarify these results.

Keywords: metabolic diseases, postpartum, beta-hydroxybutyrate.

INTRODUCTION

Bovine ketosis is a metabolic alteration, which occurs more frequently in animals at the beginning of lactation, in high production and multiparous dairy cows, characterized by an increase in ketone bodies and a decrease in glucose concentration (MARQUES, 2003; ZHANG et al., 2010).

In order to supply caloric deficiency, there is an increase in the number of ketone bodies, but the imbalance in the consumption and production of ketone bodies increases their levels in the blood, being predisposing factors for the disease known as ketosis (FLEMING, 1993; CAMPOS et al., 2005; BERCHIELLI et al., 2006).

The body condition score (ECC) is a subjective tool used to adjust nutrition, maximize productive potential and minimize reproductive disorders. The body condition is based on visual observation and palpation of specific areas to assess the deposits of adipose tissue and muscle mass. To determine the ECC is evaluated the cow's rear, ileum bones (coxal tuber), ischium (tuber ischium) and tail insertion (LAGO et al., 2001; POLYCARPO, 2007).

During the pregnancy and postpartum period of a cow, ECC can interfere with the propensity of diseases in a herd leading to infectious diseases, low reproductive efficiency, reduced milk production and metabolic disorders such as ketosis (PATTON et al., 1988). The evaluation of the ECC in the postpartum period can be useful as a strategy to prevent cows from giving birth to be too fat or too thin (FERGUSON, 1991).

Clinical ketosis is diagnosed based on anamnesis, clinical and complementary examination. For subclinical ketosis, it is necessary to detect ketone bodies in milk, urine or blood (SAMPAIO and ÁVILA, 2011).

To detect ketone bodies in the blood, a portable device is used, which measures BHB, which is the most important among them. In the reaction of BHB with a specific reagent it generates an electric current, in which its amperage varies according to the concentration of BHB (IWERSEN, 2009). The aim of the present study was to seek to establish a direct relationship between body score and the incidence of ketosis in clinical or subclinical form in dairy cows.

MATERIALS AND METHOD

This study took place in the months between September and December in the municipality of Francisco Beltrão, Latitude: 26º 04 '42" S Longitude: 53º 03 '11 "W Altitude: 570m.

Altogether forty-one blood samples were obtained, in various properties with different managements; the animals were cows recently calved between the 8th and 70th day of lactation, of the Dutch, Jersey and crossbred breeds. Concomitantly with blood collection, the animals' body condition score was evaluated, following the methods of Wittwer (2000) and Maciel (2006), respectively, for each analysis.

Blood collection was performed with coccygeal puncture using a needle (40x12) and subsequently evaluated with the tape (Opituim β-Ketone) and reading on the device (FreeStyle Opituim) (Figure 1).

The body condition score was assessed through visual inspection and based on the palpation of the transverse processes of the loin vertebrae, cranial coccygeal vertebrae (tail head). Scores were assigned using a standard five-point scale where 1 = very thin to 5 = very fat.

RESULTS AND DISCUSSION

Figure 1. Portable device (FreeStyle Opituim)

The test performed using a portable automatic device using a drop of blood has a quantitative measurement, and beta-hydroxybutyrate is the ketone body evaluated, which has a higher blood level in cases of bovine ketosis. (SAMPAIO and ÁVILA, 2011).

The parameters recommended by Wittwer (2000) were applied in this study, obtaining a positivity of 58.5% (24/41) for ketosis by evaluating all groups of ECC, all of which are subclinical (Table 1).

Table1. Results of plasma levels of beta-hydroxybutyrate (BHB) and its body score.

Number of animals	Blood	Body score
1	0,1 a 0,8 mmol/L	1
8	0,1 a 0,8 mmol/L	2
6	0,1 a 0,8 mmol/L	3
3	0,1 a 0,8 mmol/L	4
22	0,9 a 1,6 mmol/L	3
1	1,6 a 2,8 mmol/L	3

The MACIEL method, 2006, was used to evaluate the body score index (IEC), which cows are evaluated and classified from 1 to 5, with 1 being very thin, characterized by a deep cavity in the region of insertion of the tail, ribs and bones of the pelvis (pelvis) pronounced and easily palpable, absence of fatty tissue in the pelvis or loin area and deep

4

depression in the loin area. Score 2 classifies lean cows and is characterized by a shallow cavity around the tail insertion. Score 3 classifies cows in intermediate body condition and is characterized by the absence of a cavity, but the presence of fat at the tail insertion, a palpable pelvis with slight pressure. Score 4 is for fat cows and is characterized by fat folds visible at the tail insertion. Score 5 is for very fat cows and is characterized by the insertion of the tail immersed in a thick layer of adipose tissue, pelvic bones no longer palpable, even with firm pressure, and posterior ribs covered by a thick layer of fatty tissue.

The results found in the cows evaluated were 2.44% (1/41) for cows with ECC 1; 17.07% (7/41) for cows with ECC 2; 73.17% (30/41) for cows with ECC 3, 7.32% (3/41) for cows with ECC 4, no animal presented ECC 5 (Table 1). It can be seen that all positive animals had an adequate body score index, classified in 3 (Table 2).

Table 2 - Percentage of positive animals related to the body condition score.

	Positive
Score 1 – 2	0%
Score 3	100% (24/24)
Score 4 - 5	0%

To compare positivity between the whole blood test and the body condition score index, the data were evaluated statically by the R program using the Linear Regression Test, which presented a result equal to 0.222, so there is no linear correlation with level of significance, considering a level of 5%. As the value presented was lower than this number (0.5), it can be said that statistically the ECC is not related to the test with blood samples (Graph 1).
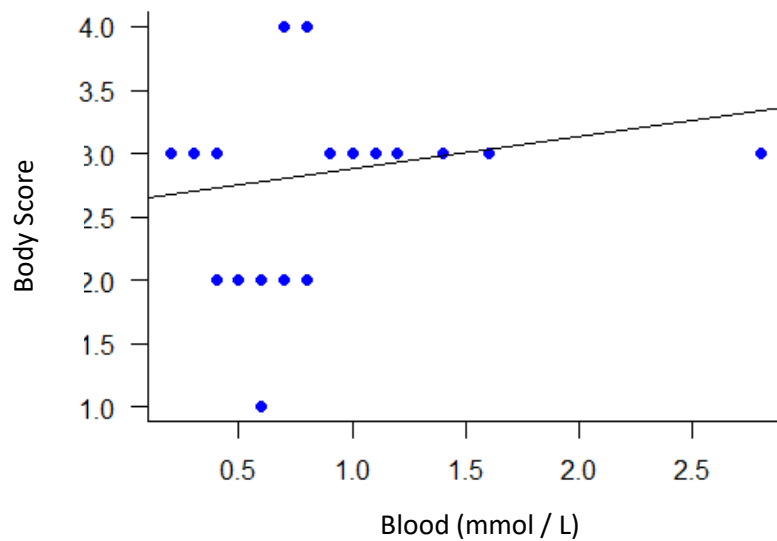
Graph 1. Correlation of body score of cows positive for
ketosis. diagnostics through blood with portable devices.

According to Santos (1996) and Lago et al. (2001), birth weight, weight loss and loss of body score in the postpartum period are higher and different for groups that had a high body score index. However, very fat as well as very thin cows are at risk of having metabolic problems and diseases, reduced milk production and conception rate and difficulty in calving (GEARHART, 1990; FEREGUNSON et al., 1991).

Although in this work the statistics reveal that there is no relationship between ketosis and the body score index, it is normal that cows after calving present a weight loss that can vary from 0.5 to 1 points less in the body score and in the cases of ketosis this fact is even more accentuated. This suggests that the animals in this study had a higher body score before parturition than at the time of diagnosis of subclinical ketosis. These probably had a score of 3.5 to 4, indicating an overweight in the delivery.

This assumption reinforces the reports by Edmonson et al. (1989) and Pedron et al. (1993), who stated that cows with elevated body conditions (4 - 4.25) are more prone to ketosis due to the fact that they have less consumption soon after calving, mobilize more body reserves and tend to lose more weight.

According to LeBlanc (2012), in practice, the entry of cows in the dry period with high body condition should be controlled, prioritizing scores that should vary between 3 and 3,5.

CONCLUSION

During pregnancy and in the postpartum period of cattle, the body condition score can interfere with the development of conditions, with ketosis being one of them. What can be proven in this study, although all positive cows have an adequate score during the evaluation, it is known that before delivery there is an increase of 0.5 to 1 point in the score, which may indicate that the cows evaluated were overweight animals.

The present study demonstrated that there is no relationship between subclinical ketosis and body condition score, it is suggested that more research be carried out with more monitoring rates to clarify these results.

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