
EVALUATION OF THE TRANSFER OF COLOSTRAL ANTIBODIES BETWEEN MOTHER AND CALF

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ABSTRACT

In our experiment there were included 10 breeding cows of the Czech Spotted Cattle and their calves. The aim of the experiment was to evaluate the monitoring content colostral Ig G in colostrum cows that were included in the experiment and compare with γ -glutamyl transferase (GGT) in the serum of calves, which is the indicator of adequate feeding colostrum in calves.

Samplings of colostrum were performed at 0, 6, 12, 24, 48 and 72 hours after the birth into the vacuum churns with a portable milking tract. A representative sample was always taken from the total cow colostrum. The colostrum cows were measured with following values Ig G 0 = $97.19 \pm 33.197 \text{ g l}^{-1}$, 6 = $94.46 \pm 50.092 \text{ g l}^{-1}$, 12 = $43.71 \pm 24.310 \text{ g l}^{-1}$, 24 = $23.39 \pm 15.078 \text{ g l}^{-1}$, 48 = $9.60 \pm 7.113 \text{ g l}^{-1}$, 72 = $6.08 \pm 7.173 \text{ g l}^{-1}$. GGT levels in calves after cows were $18.74 \pm 10.435 \text{ U / l}$. The results were statistically processed in Microsoft Excel.

We can conclude that there is no sufficient breeding transfer of colostral antibodies Ig G, due to insufficient nursing job.

Key words: Czech Spotted Cattle, colostrum, IgG, γ -glutamyl transferase, blood serum

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INTRODUCTION

Currently in the cattle breeding there are quite often problems with calves with subsequent mortality of calves. Staněk et al. (2012) indicate that in 175 breeds of dairy cattle, the mortality of calves in weaning was between 1.4 to 17.5 %. The causes of these deaths can be different. These are mainly diarrheal diseases caused by lack of drinking rumen function bonnet-maw weir, tympany of calves, calves respiratory syndrome, changes in the umbilical region, arthritis, lack of selenium and vit. E and mutual sucking calves. Pavlata et al. (2012) believes that an important factor in the unfavorable situation in the rearing of calves is to minimize the cost of the nursing work. The results of the research and breeding practices show that any neglect of the calf at the colostrum nutrition has long-term negative effects. The breeders should be experienced in the proper treatment principles of a calf after birth (Saun, 2012). In this article we will focus on the need to control the quality of colostrum for the calf, which is important in achieving colostrum immunity, followed by an evaluation of sufficient connection calves colostrum control over the GGT levels in calves and highlighting the correct principles leading to the successful rearing of calves.

MATERIAL AND METHODS

This work was processed on the farm in the Pardubice region. The observation included 10 Czech Spotted Cattle. Group of cows received an identical ration. The colostrum from cows was collected at times 0, 6, 12, 24, 48 and 72 hours after birth. The samplings were carried out by nursing staff in vacuum cans with a portable milking mechanism. The colostrum was kept in the 30 ml sample cards with a proper labeling. Then the samples of the colostrum were frozen and as a comprehensive set they were transported to the laboratory LABtechnik Brno. In the laboratory, the quantitative determination of Ig G bovine from the biological samples was made, using the method of a sandwich enzyme-linked immunosorbent assay (ELISA).

After the sampling was done, it has been lodged with the competent colostrum of the calf and it was connected to the nursing staff. To obtain the blood of the calves, the sample was taken from the vena jugularis at the 3rd - 5th day after birth. The blood was transported to the laboratory where the separation of a blood serum was made at a laboratory centrifuge at speed of 3500 rev / min for 10 minutes. In the laboratory there was a further investigation of γ -glutamyl transferase (GGT) on the unit Reflovet. The results were statistically analyzed using the Microsoft Excel.

RESULT AND DISCUSSION

The control of the colostrum quality is already commonly used in practice by hydrometer. But it is sometimes not enough and it is necessary to check any further handling of colostrum, the route of administration and the storage of colostrum, and to perform direct controls of the level of colostrum immunity. There are several possibilities of how to objectively check the results. There is an inspection of the blood of the calves checking the concentration of IgG, a determination of total immunoglobulin (Ig) using the zinc sulfate method, a determination of total protein in the serum after determination of γ -glutamyl transferase (GGT), which is an enzyme from penetrating into the blood calf colostrum (Šlosárková et al., 2011). We can supplement the already mentioned control of colostrum by hydrometer by laboratory, quantitative determination of Ig G from biological samples by sandwich enzyme-linked immunosorbent assay. This gives us a clearer idea of the quality of colostrum.

In our follow-up, the values that were determined are shown in the Graph. 1.

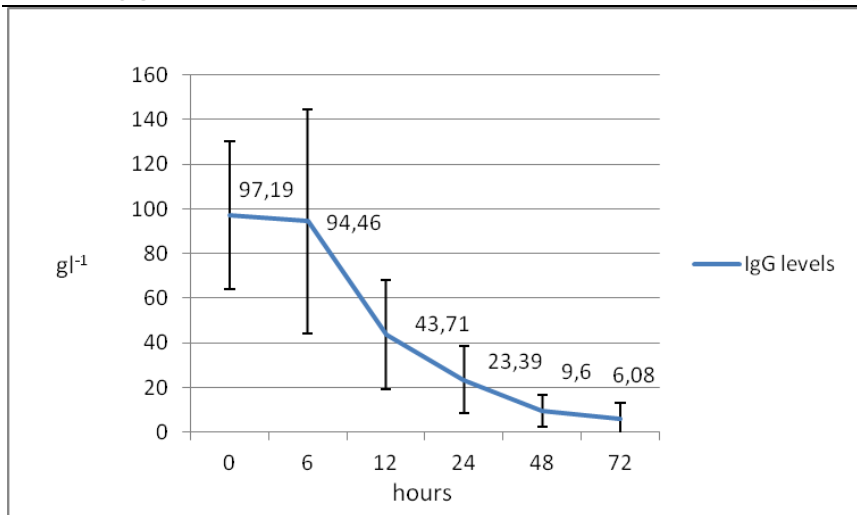


Fig. 1 Development levels of immunoglobulin G in time

These values can be evaluated as satisfactory in the comparison with other authors. Toman et al. (2009) indicate that the average value of Ig G in early colostrum is 73.95 g l⁻¹. Suchý et al. (2011) indicate that the quality colostrum should contain 30 to 80 g l⁻¹ Ig G. Further work by Šlosárková et al. (2011) shows that good colostrum can be seen as the one, where the content of the Ig G is greater than 50 g l⁻¹. If we take these values as a standard, we can consider as a high-quality colostrum the one we collected during our monitoring in 10 hours. Bárta et al. (2008) agrees with this and recommends due to the decreasing ability to absorb immunoglobulins within 10 hours of giving birth the first intake of colostrum.

If the quality of colostrum is at a high level despite the frequent health complications and eventual mortalities it is necessary to proceed directly to check the level of colostrum immunity. One possibility is the examination of the enzyme γ -glutamyl transferase (GGT) in the blood of the calf. GGT is an enzyme which determination in the adult animals is commonly used for diagnosing liver disease, but at high concentration they are also present in the colostrum, and if a calf colostrum is connected, then this enzyme together with other components of colostrum is absorbed and its activity in the blood of calves is significantly increased. During the first days after the connection can reach values of 50 to 80 U / l, but given that the half-life is relatively short, its activity is rapidly decreasing. The calf is well connected around the 6th activity GGT day at 8-10 U / l (Pavlata et al., 2012). Since our samples were collected between the 3. – 5. day and their average value was around $18.74 \pm 10,435$ U / l, we can say that these results are stretched. It is necessary to individually assess the situation in the monitored breeding. In our observation, it was found that colostrum produced in breeding is good and should be in compliance with all principles of rearing calves to ensure adequate passive immunity. Follow up GGT levels in the blood of calves, but discovered some reserves. Some of the integral part of the care of the calves may be incorrectly performed and the method of administration of colostrum, the amount administered colostrum and wrong time of colostrum administration.

CONCLUSIONS

We can conclude that the quality of colostrum in the monitored breeding was in a satisfactory way, but in the care of the calves and their treatment was breeding at an average level. Although colostrum quality, so it cannot replace the other. If you do not ensure quality nursing care for newborn calves, the risk of health problems in calves are very high, even at high quality colostrum. It is necessary to train caregivers about proper connection calves up to two hours after birth the necessary amount of high-quality colostrum and colostrum quality is constantly monitored. If we provide the right conditions for the body in the postnatal period, we can expect its production life of an adequate response.

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