
Energy balance between the milk production and the level of feeding in the first hundred days of lactation

P. Novak¹, S. Kracmar², L. Novak³, I. Knizkova⁴,
P. Kunc⁴ & J. Vokralova¹

¹Department of Nutrition, Animal Breeding and Animal Hygiene,
Faculty of Veterinary Hygiene and Ecology, University of Veterinary and
Pharmaceutical Sciences Brno, Palackeho street 1-3,
612 42 Brno, Czech Republic
E-mail: novakp@vfu.cz

²Mendel University of Agriculture and Forestry Brno, Zemedelska street 1,
613 00 Brno, Czech Republic

³Faculty of Medicine, Masaryk University, Brno, Komenskeho nam.2,
662 43 Brno, Czech Republic

⁴Research Institute of Animal Production Prague, Pratelstvi 815,
104 01 Praha 114 – Uhlirneves, Czech Republic

After calving, high nutritional requirements for lactation do impair the body condition during the first 60 days of the milking period. The amount of the milk drawn and the body mass changes during the first one hundred days of milking clearly indicate that the peak of milking curve is reached between the 20 – 40 days of milking. The amount of the feed consumed on contrary peaks during the 40 to 60 days after calving. This disproportion in the energy balance is the cause of the body decrease in the region from 60 % (after first calving) to 88 % (in the cows in the 2nd lactation).

Key words: Dairy cattle, milk production, body mass decrease

In early time of lactation, feed intake is unable to cover the demands of high milk production. The average cow commonly peaks in milk production at 4 to 6 weeks of lactation, but her feed intake reaches the peak about 9 to 11 weeks. This situation gets the organism of cow in to the negative energy balance followed by the body mass decrease. In farmers practice the body condition of cows deserves to be evaluated with respect to their energy resources in the form of fat. This energy

Summary

Introduction

resource, at the begin of lactation, can help to cover the imbalance between the energy content in milk drawn and the energy gained from feed.

Material and methods

The on 22 high pregnant heifers of the Czech pied cattle crossed with Holstein cattle was divided into the experimental group, supplemented two weeks before the expected calving and up to 5 day after calving with additional dose of corn mixture. The animals of the control group were fed with the standard ration. The live body mass of milking cows has been estimated in two weeks period with accuracy of ± 1 kg. The weighing has been don always after the evening and morning period of milking. The milk production was controlled up to 100 days of lactation.

Results and discussion

The body masses of some cows in the first lactation are depressed up to the level of 60 % of the average value. On contrary during the second lactation, in the control group, decreases the body mass only to the level of 80 %. The cows of do exhibit the decrease in body mass in the interval between the 20 up to the 50 days. The body mass in the experimental group decreases only to 80 % of the value before calving. However also in the control group some individuals do exhibit the body mass decrease only to the 95 % during the first 60 days after calving.

The milking curve in the experimental group start at the level of approx. 13 kg of milk per day and reaches the peak between the 40-50 day at the level around 15,5 kg per day. In the control group, the lactation curve start at the level of approx. 9,5 kg per day of milk drawn and did reach the peak in the region of 50 so 60 days at the level of around 12,2 kg per day of milk drawn.

The average body mass of all cows at the begin was 492 kg. Up to the 40 days the body mass decreases to the value of 480 kg. At the same time the lactation curves did approach their peak values in both groups. The lactation curves after reaching the peak go into the auto retardation period and the amount of energy consumed levels the needs for milk production and enables to regain the body mass lost during the previous interval.

The observed coincidence between the auto retardation of the lactation curve and the start of regaining the body mass corresponds with the views presented by Windisch (2003), that the lactation curve is guided by the internal regulatory processes, they do not respect the amount of energy which is in the first 2 to 4 weeks period after calving at disposal from the total mix ration consumed. This corresponds with the general view of Jelínek, Koudela et al. (2003) about the humoral regulatory mechanism they do influence the milk production in the udder.

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Jelinek, P., Koudela K. et al., 2003: The Physiology of Farm Animals. MZLU Brno.

References

Vokralova, J., Novak, P., 2002: The influence of lactation curves in health herd management. In. Workshop: „Animal Environment Interaction“ VFU Brno 2002, 28-29.

Windisch,W., 2003: Fehlersnahrung laktierender Milchkuhe und Ihre Wirkung auf Stoffwechsel und Leistung. In.: 2.BOKU-Symposium TIERNÄHRUNG.Wien.2003,1-7.