The Effect of Biostimulative Substance on Daily Milk Yield and Quality Components in Cow´s Milk

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Abstract
The aim of this work was to assess the impact of the liquid Biopolym FZT on quality components in cow´s milk and daily milk yield. Biopolym was, calibrated by a milking robot, given to dairy cows in a selected breeding around České Budějovice for a selected period of time. It found a slight increase in the average daily milk yield in dairy cows at first lactation. Daily milk yield increased on average by about 6, 7 L, but all we can give only the product but also as good nutrition. Because the components of milk a slight increase in fat levels in milk, while the impairment of protein.

Keywords: Biopolym, fat, proteins, rumen

1. Introduction

Breeding is a constant effort to increase livestock performance and production economics. The most important part is then to provide quality nutrition to dairy cows, enabling them to efficiently convert roughage to milk.
Additive substances that favourably influence the characteristics of feed improving performance and resilience of animals also play an important part in cow feed. At present, attempts are made to use substances derived from natural products. Biopolym, used in this study, is such a substance, namely a bioalginate derived from brown seaweed.
The aim of this study was to determine the effect of Biopolym on daily milk yield and quality of milk components (fat, protein).
Biopolym is hydrolyzed brown seaweed, *Ascophyllum nodosum*. It contains vitamins, iodine, amino acids, alginate acid in the form of

sodium alginate E 401 and other trace elements. It is designed for addition to drinking water and feed. It stimulates the development of intestinal microflora, microorganisms for gastric
digestion and accelerates the transmission of nutrients into the bloodstream. It will hereby also promote feed intake and more efficient use of nutrients. Biopolym has diverse effects, one of them being an increase in milk yield in dairy cows [1]. Milk is a suitable testing medium for the evaluation of development of the energy metabolism in dairy cows [2]. Milk quality is also significantly affected by proper adjustment and sufficient care of milking equipment as well as milk cooling. It is desirable to align the requirements on cows and milking machines. Good milking robot is able to provide following operations and tasks: identification of animal, cleaning of udder (teats), preparation for milking, first strike separation, testing of milk quality, udder check - testing for mastitis, measuring the activity of belling prognosis, the use of milking machine, milking itself, milking machine removal, collection of data on the amount of milked milk [3].
Changes in metabolism, which have negative impact on the quality and the quantitative composition of milk, are often manifested as rumen dysfunction. There are failures and proteo-

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synthetic fermentation processes in the rumen caused by a sudden change in diet, by poor physical structure, low quality or digestibility and by other shortcomings to the required quality of feed. Unless optimum nutrition is ensured, there cannot be any expectations on good milk production. In assessing the level of nutrition it is not enough to judge only from the content of nutrients in the ration, but also from the reached levels of fermentation processes in rumen, as these actually decide the conversion of nutrients and the level of milk production [2].

The most important processes that take place in the rumen, are the fermentation of carbohydrates and the conversion of the less valuable vegetable protein for high quality -bacterial protein [2]. An integral part of the rumen are microfloral bacteria such as cellulotic bacteria, bacteria producing volatile fatty acids (VFA), lactic acid and methane and proteolytic and lipolitic bacteria, protozoa, that uses slightly fermented sugars and polysaccharides, preventing pH decline and stabilising hemicellulotic activity and fungi, that show high cellulotic and hemicellulotic activity [4]. Carbohydrates are the most important source of energy for rumen microbes [5]. The function of enzymes of the rumen microflora is to degrade soluble carbohydrates from simple sugars to cellulose. The resulting products of this fermentation are volatile fatty acids [2]. Proteins are partially decomposed by rumen bacteria and protozoa to peptides, amino acids and finally to ammonia [6]. Freed ammonia is used by rumen microflora in bacterial biomass production. Nutrients created by microbial activity are the basis of nutrition for the organism and precursors for milk production [2].

2. Materials and methods

The effect of liquid Biopolym FZT on the daily milk yield of dairy cows and on the quality of milk constituents (fat, protein) was studied on selected animals, located near České Budějovice. The original barn, located at an altitude of 440 m above sea level, has undergone a complete modernization, is equipped with three milking robots (Astronaut A2) and operation is now fully automated. The barn has a capacity of 210 pieces of cows of Czech Pied cattle breed.

The experiment conducted in this chosen location involved adding liquid Biopolym FZT (bioalginate seaweed) at a dose of 24 ml / cow / day diluted 1:1 with water in one of the robots (robot number 3). Robot number 3 thus serves the experimental group of cows, while robot number 2 serves a control group, i.e. without product addition.

In both groups (control, experimental) the cows were divided according to lactation (1, 2, 3). The individual lactations for the two groups were then compared as to the daily milk yield, respectively to the average daily milk yield and milk components (fat, protein). The experimental period lasted 5 months (July-November). Daily milk yield were recorded by the milking robots and were subsequently stored in a computer, while data on milk components (fat, protein) were derived from monthly monitoring tests.

3. Results and discussion

Comparing the results of experimental and control groups the highest increase in average daily milk yield in dairy cows was observed at first lactation (Figure 1). For the other lactations increase in the average daily milk yield appeared after a prolonged period of time.

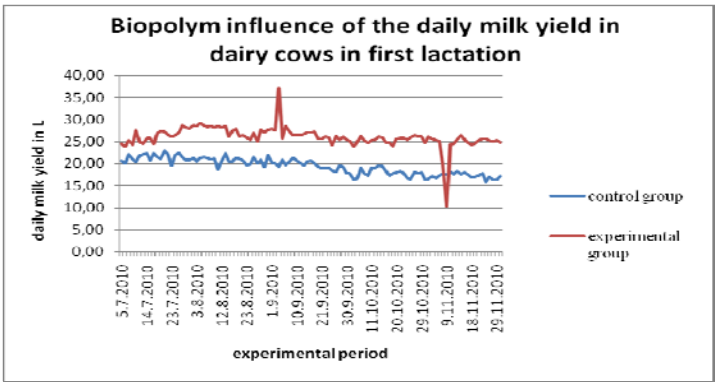

Figure 1. Average daily milk yield in dairy cows at first lactation

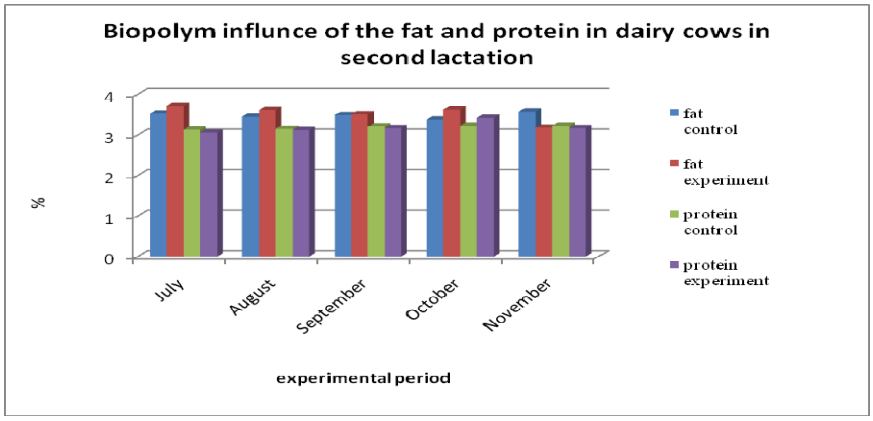

Figure 2. Values of fat and protein% in dairy cows on second lactation

Table 1. Values of fat and protein% in dairy cows on second lactation

Specification	fat control	fat experiment	proteincontrol	protein experiment
July	3.53	3.71	3.13	3.06
August	3.45	3.62	3.15	3.12
September	3.49	3.51	3.21	3.17
October	3.38	3.63	3.23	3.42
November	3.58	3.18	3.23	3.17

In terms of assessing the quality of milk components occurred in dairy cows in all lactations was slight impairment of protein, while the values of fat in all lactations of dairy cows showed a slight increase. The biggest effect can be observed in the second lactation (Figure 2, Table 1). These results show a slight increase in milk yield in dairy cows that were administered Biopolym [1]. Also, as shown by [2] and proved by this experiment, it is important to ensure optimal nutrition for the subsequent achievement of desired fermentation processes that greatly determine the conversion of nutrients and milk production.

4. Conclusions

The product Biopolym positively influenced the average daily milk yield for all lactations. The components of milk were only slightly effected by Biopolym where protein levels showed a decrease, while fat levels increased slightly.

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