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THE USING OF METHIONINE IN COW FEEDING

Anna Horchanok , Oksana Kuzmenko, Nadiia Hubanova

Dnipro State University of Agriculture and Economics

Bila Tserkva National Agrarian University

In intensive dairy farming highly productive cows require comfortable conditions for keeping and full value feeding. With the obtaining of high animal productivity in accordance with their genetic potential it is necessary to achieve the consumption in rations of animals more dry substance with a variety of high quality feeds of high concentrations of energy and basic nutrients [2, 4].

Intensification of milk production leads to the spread of diseases associated with metabolic disorders. Highly productive cows are more exposed to stress factors, negative effects of the environment, they are more demanding to the conditions of keeping, feeding, therefore they are often diagnosed such diseases as acidosis, ketosis, fatty liver hepatitis [1, 2, 5].

The main element of the body is protein, which is a complex organic compounds with high macromolecular weight, built mainly from amino acids. They play a primary role in an organism performing a function that provides vital activity. Proteins are closely related to all processes of cell life. Replenishing the lack of amino acids in the diet can be done with the using of synthetic amino acids [3].

Methionine is an essential sulphur-containing amino acid, in the diet of farm birds it is the first limiting amino acid and the second after lysine in cattle feeding. Lack of methionine in the diets of farm animals and poultry negatively affects the digestion of nutrients and in particular protein from feed, which leads to a decrease of productivity, appearing deviations in development and animal diseases.

Methionine is a strong antioxidant and hepatoprotector, which provides effective protection of the liver from various negative viral, toxic, immune factors [2, 3].

The problem of amino acid availability of high-yield dairy cows at the peak of lactation is one of the most acute problems in domestic zootechnics with a shortage of sources of adequate protein. The analysis of the world dynamics of the priorities of the milk quality assessment shows that the concentration of milk protein becomes an important indicator especially in the production of cheese [1, 2].

Recently great importance is given to methionine that is why the question about feeding it to highly productive cows in the "safe" form in order to protect against the action of microorganisms of the rumen is asked.

Numerous studies conducted abroad, including recent ones in Ukraine, suggest that the feeding of the drug Smartamin promotes increase the yield of milk of natural fat with the simultaneous increase the content of protein and fat in it, and it also has a preventive and therapeutic effect on liver metabolism and improvement of reproductive function of cows.

"Safe" methionine is in granules of Smartamin, it easily blend with all types of feed and additives. The norm of daily dose of Smartamin is only 12 g per head per day which allows to

increase the protein content in milk by 0.1-0.35% and significantly improve the technological properties of milk. Yield increases with the use of Smartamin, during the first 100 days of lactation milk production increases by 1.5-3.5 kg per head per day.

The aim of the research was to determine the effect of the drug Smartamin on the digestibility of nutrients as well as on the productivity and quality of milk.

The studies identified three accounting periods: a preparatory period of 15 days, accounting, and balance. All animals were selected by the principle of analogical pairs, the animals were pure-bred and had a similar productivity of mothers.

In the preparatory period work was carried out to form groups and adapt animals to experimental conditions. For research, Ist (control) group and IInd (experimental) group were formed.

The control group of animals during the preparatory and basic periods received the basic diet (BD). The experimental group of animals in the main period consumed an additional "safe" methionine in the form of the drug Smartamin.

The granules of the drug Smartamin, containing 75% of methionine, are easily mixed with practically all types of feed. After the destruction of the shell in the abomasum more than 90% of methionine come into the small bowel and completely absorbed there.

Analyzing samples of feed of the experimental diet, in which the largest amount of essential amino acid methionine was contained in concentrated feed: in sunflower meal - 7.8 g/kg, in grains from 2.6 to 4.9 g/kg, and in alfalfa haylage - 2.2 g/kg.

Animals of test groups consume oatmeal hay - 3.5 kg; corn silage of milky-wax ripeness - 28.91 kg; alfalfa haylage - 11.14 kg; fodder beet - 14.29 kg; beet molasses - 1.41 kg; grain: of corn - 1.34 kg; barley - 1.41 kg; peas - 1.0 kg; sunflower meal - 1, 0 kg per day.

According to researches cows of the 2nd experimental group had the diet balanced by methionine by 92.0% as a result of the additional introduction of "safe" methionine in the form of granules of the drug Smartamin in the amount of 12 grams per day, which is provided by the methodology of scientific and economic experiment.

The level of feeding in the control and experimental groups was practically the same, the coefficients of digestion of protein, fat, fibre were higher for animals of the 2nd experimental group; the dry substance by 1.92; organic substance by 1.96; "raw" protein by 3.94; "raw" fat by 4.85 and "raw" fibre by 2.46 of absolute % ($P > 0.95$).

According to the results of the research it was found that daily average yields of milk of natural fat in the experimental group exceeded the control by 10.06%. Respectively in the 2nd experimental group the average daily yields with a 4% fat content milk exceeded by 12.50% due to the influence of the drug Smartamin. Also, an increase in the content of fat and protein in milk was noted by 1.68 and 4.11% respectively.

Thus, when feeding "safe" methionine, there was an intensification of metabolism, especially of protein metabolism and lipid metabolism, which leads to increase of milk fat and protein.

As a result of our research we managed to increase the productivity of cows and improve the quality of milk.

Also, the main end products of nitrogen metabolism are urea and creatinine secreted with urine. Creatinine in the blood of experimental cows at the beginning of the experiment was at the lower limit of the physiological norm and in the period of the experiment decreased in the 1st control group by 30.25%; in the 2nd group by 43.02%. This indicates that protein metabolism increased. Muscles lose very important nitrogenous substances - creatinine, which passes into urine. There may be a negative result of nitrogen balance, which also depends on the physiological state of the liver.

Urea in blood serum was within the limits of physiological ranges, indicating a sufficient

balanced protein-energy metabolism. Studying of the biochemical composition of blood of experimental animals did not detect significant differences in the concentration of urea, glucose, mineral substances between groups.

As a result of the research it was found that in the first 100 days of lactation in the organisms of highly productive cows there was a high intensity of protein synthesis and "safe" methionine contributes to the normalization of nitrogenous substances metabolism and protects from disassimilation in the rumen.

To stabilize the metabolism of nutrients, in particular to reduce the risk of ketosis, fat liver and other disorders, "safe" methionine in the granules of the drug - 12 g per head per day is used.

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