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Changing Cows's Productivity by Influence Yeast Culture.

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ABSTRACT

In the article the results of the use in feeding of cows of Simmental breed, brought into the foothill areas North Caucasus (Karachaevo-Cherkessia) of Russian Federation from Austria, probiotics, including strains of yeast cultures. The influence of drugs BIOTAL platinum, I-CAK¹⁰²⁶, I-CAK¹⁰²⁶, Selenium and Estur through gastrointestinal tract on dairy cow performance. Based on research and practical experiments, there is had proposed in order to improve efficiency of yeast additives to use them in combination with one of preparations organic selenium.

Keywords: probiotics, gastrointestinal tract, cows of Simmental breed, intestinal microflora, yeast culture, milk production.

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INTRODUCTION

Adaptation of animals to new natural conditions is had achieved by normalization gastrointestinal tract, which can be obtained by including in the rations for animals probiotics and preparations on their basis. The effect of use probiotics is due to their regulating and stimulating effect on endogenous microflora and immune system.

Yeast cultures, related to probiotics, have use in feeding different kinds of farm animals. They have a positive effect on microflora of digestive tract [1]. In Russian Federation in diets of dairy cows, supplements in the form of yeast cultures are had used with 80-ies of XX century.

Their role increases significantly by use it for imported livestock high productivity, but is not adapted to new conditions. There is directionally affect the mobilization of internal reserves of an organism of highly productive animals, it is necessary to have information on the functional impact of various probiotic preparations.

Study of the mechanism of action of these drugs can use to optimize the system adaptation of Simmental cattle, imported in the foothills of the North Caucasus of the Russian Federation (Karachaevo-Cherkessia) from Austria. In the economic conditions Karachay-Cherkessia brought animals of this breed is economically feasible method of converting cattle in the direction, meeting the requirements of the market.

MATERIALS AND METHODS

To study the effect of different probiotic preparations on milk productivity Simmental cattle breed which were delivered to Karachay-Cherkessia from the Austrian was held scientific-production experience in LLC firm "hammer" Ust-Dzhugutinsky district of the Karachay-Cherkess Republic.

For the experiment, there were formed 5 groups of similar animals – milk cows in the 2nd or 3rd lactation. Groups of animals for experiments had formed by method of analogue – given the milk yield in the previous lactation, age and time of calving. The main diet of cows was the same, but the control group in the experimental group's diet was added biologically active culture of yeast: BIOTAL platinum, I-CAK¹⁰²⁶, I-CAK¹⁰²⁶ and Selenium, as well as Estur.

The rations of cows was calculate from daily milk yield of 18-20 kg, that is the real productivity herd in firm "Hammer". They were balance on all major nutrients. The number of feeds in the rations was traditional for this zone of Karachaevo-Cherkessia. In 1 kg dry matter of the diet of cows in dry period were kept to 9.7 MJ of metabolizable energy and 86 g assimilable protein during lactation in the winter period compared to 10.87 MJ of energy and 114 g assimilable protein, in the summer – 10,13 MJ of energy and 133 g assimilable protein. Dietary supplements were given to cows once a day, mixed with concentrates or individually for each animal according to the following scheme: group 1 (control) received the basic diet (RR), 2 group – OR + I-CAK¹⁰²⁶ (10 g/day. in day), group 3 – EO + I-CAK¹⁰²⁶ (10 g/day. per day) + Selenium (3 g/day. in day), group 4 – EO + BIOTAL platinum (25 g/day. in day), group 5 – PR + Ester (7 g/day. a day).

All of probiotic preparations that are had given to the cows, contained live yeast culture, but differed in its composition and the particular impact on the digestive processes of animals.

BIOTAL platinum is a drug for dairy cows, normalizing processes of cicatrice digestion in a concentrate type of feeding and disorders related to the digestion of fiber. It contains a strain of live yeast *Saccharomyces cerevisiae* 1077 and valuable organically bound forms of selenium and zinc, ensuring full requirements of dairy cows in these elements. 1 kg product contains 80 mg of selenium, and 2,000 mg of zinc. Ester – is a natural feed additive based on three strains of live culture of yeast *Saccharomyces cerevisiae* (8810 CZ, CZ 9201, CZ 9820) and a complex of biologically active ingredients: enzyme extract containing amylase, protease, cellulase, pektinaza, the phytase; amino acids; vitamins; protein and mineral additive based on manganese, copper, zinc and iron; mannanoligosaccharides. Ester stabilizes the microflora of the rumen, improves digestion, has an immunostimulating effect, and inhibits the reproduction of pathogenic microflora. I-CAK¹⁰²⁶ – live yeast culture specially selected strain of *Saccharomyces cerevisiae* 1026.

I-CAK¹⁰²⁶ stimulates the growth of desirable bacteria, inhibits the decrease in pH, utilizing lactic acid. In the rumen I-CAK1026 develops as a symbiont of the rumen microflora and consuming entering with the feed oxygen, promotes the growth of beneficial rumen bacteria [6,7,8]. This creates the conditions for intensive and more complete digestion of fiber [9].

Selenium is a natural feed additive (organic selenium) for farm animals, based on a special strain of *Saccharomyces cerevisiae* grown on selenium salts in a manner that enhances the inclusion of selenium in the organic structure of the yeast. Selenium in this Supplement is in structural connection with the amino acids in the composition of Selenomethionine and selenocystine [2].

I-CAK1026 was fed to animals in pure form or in mixture with Selenium.

During the experiment, we used individual record keeping milk production of cows took into consideration daily average milk yield and total milk yield over the observation period.

During control milking were taking average samples of milk for research in units of output per day. Samples were placed in a portable cooler and sent to the laboratory to determine fat and protein content.

RESULTS AND DISCUSSION

Brought cows of Simmental breed in the natural climatic conditions of Karachay-Cherkessia has shown quite a high productivity. This is partly because purchase and delivery of animals was preceded by the preparatory work related to the study of ecosystems and economic conditions of foothills of the North Caucasus of the Russian Federation (Karachaevo-Cherkessia), as well as the possibility and expediency of introduction of Simmental cattle from Austria to the region of the Russian Federation. The results of the research testify to its good adaptation to the natural conditions of Karachay-Cherkessia.

It is established that the application of the BIOTAL platinum stimulates the increase in the number of cellulolytic bacteria and rumen fungi, which digest fiber. As a result, increases the activity of specific enzymes in the rumen and improves digestibility of the feed ration. All this leads to increased consumption of dry matter by the animals, improves feed conversion, allows more efficient use of feed and improve milk quality indicators [2, 3, 4].

It is proved that Ester provides substantial and statistically significant improvement of feed conversion and increases milk yield and milk fat content, enhances resistance to diseases [2, 5].

Establish that I-CAK¹⁰²⁶ reduces the time between arrival of feed in the rumen and the start of digestion, which leads to increased consumption of animal ration dry matter 1.2 kg [10, 11]. The study of the mechanism of action I-CAK1026 allows to characterize it as "the optimizer rumen digestion" [12].

Milk yield in all groups was high, but there have been some differences, depending on what supplements receive cows in addition to the basic diet feeding. In the control group, milk yield of cows was equal to 5060 kg. When fed yeast AND additives-CAK1026 cows increased milk yield, relative to control, at 402 kg, or 7.9%. And-CAK1026 in combination with Selenium milk yield raised even higher – up to 617 kg, or 12.2%. The use of the drug BIOTAL platinum, which includes selenium and zinc, added to output per 485 kg of milk (9.6%), and the use of Ester gave an increase of 291 kg of milk (5.7 percent).

When using I-CAK1026 + Selenium and BIOTAL platinum daily milk yield compared with the control group increased by 2.15 kg and 1.57 kg, I-CAK1026 and Ester – 1.23 and 1.0 kg. Cow 3 groups, with the highest daily milk yield, daily milk compared with peers 2, 4 and 5 groups at 0.92 kg, 0.58 kg and 1.15 kg.

The coefficient of variation of daily milk yield into feeding probiotic was lower than control, which indicates a more stable, evenly flowing process of lactation in cows.

The greatest amount of milk fat and protein obtained in 3 and 4 groups. Cows of all experimental groups on total yield of milk fat exceeded 200 kg in group 2 – 18.3 kg, 3rd group – 34.5 kg, in group 4 – 25.1, 5 in the group is 22.2 kg.

The amount of protein in milk experienced cows advantage over the control was in the range of 10.9 to 20.0%. The highest protein yield was registered in cows 3 and 4 groups of 201.5 kg 194,0 kg.

Metabolic energy for milk production most rationally spend cows of 2-5 groups. The energy cost of 1 kg of milk were lower than in control group 8.4–10.9 per cent, on the production of milk fat – 5.4–11.2% of the protein synthesis – 7.2–18,0%.

In the control group, the maximum daily milk yield recorded on the second month of lactation, in 2-5 groups in the third month.

Having reached the maximum, milk yield began to decline gradually, but this was different. In the control group, the reduction of yield occurs uniformly in the course of five months, in-group 2 – six months, and in 3-5 groups – for seven months. For the first six months of lactation of Simmental cows from to 70% of the annual milk yield of milk.

The high persistence of lactation of cows distinguishes 4 groups was 81.5%, in other groups the ratio varies from lactation 78,3 to 79,7%.

CONCLUSION

All dietary supplements, tested in the experiment, are a live culture of the yeast of different strains. Different responses of cattle on study supplements, primarily, unequal activity of yeast strains, used in formulating feed additives. Secondly, in 3, 4 and 5 groups of cows received supplements of yeast cultures in combination with other active ingredients and the resulting productivity is the response of animals not only on yeast component, additives, and other members of BAS.

The best option should recognized as simultaneous feeding in the diet I-CAK¹⁰²⁶ and Selenium. Cows in this case, the daily added more milk compared with animals of other groups. It should note as a positive influence on milk production of Simmental cattle, which was provide by the inclusion in the diet of BIOTAL platinum.

Cows of all probiotic treated groups were characterize by more stable, evenly flowing lactation, caused by better digestion and assimilation of dietary nutrients, under the influence of supplementation of yeast cultures, optimize processes of rumen digestion.

Thus, these data serve as a reliable proof of the advantages of cows feed BAS, and in order to improve the efficiency of the use of yeast additives appropriate to use them in conjunction with one of the organic preparations of selenium. Studies have also found high adaptive capacity Simmental cows of Austrian selection.

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