



## Study of Scar Content in Cows When Using Carbohydrate-Vitamin-Mineral Concentrate «LS»

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### ABSTRACT

Scientific studies of feeding dairy cattle prove that it is most rational to balance rations according to standardized nutrition indicators due to concentrates, which contain all the necessary nutrients in the main diet, consisting of bulky feed (succulent and rough). The advantage of using protein supplements in the feeding of farm animals is that there is no need for oncoming transport of grain fodder and animal feed, which significantly reduces the cost of livestock production. The digestive apparatus of ruminants, due to the presence of pre-stomachs, is adapted to the absorption and digestion of a large number of coarse plant foods. The main feature of the processes of digestion of ruminants is that the food eaten by animals is exposed to microorganisms in the rumen. Ammonium and other nitrogenous compounds are an accessible form of nitrogen for organisms from which a microbial protein is synthesized in a rumen. This protein and unsplit protein feed are sources of coverage of the amino acid needs of the animal. The contents were investigated: pH, the total concentration of volatile fatty acids (VFA) - butyric, propionic and acetic; the total number of microorganisms and number of ciliates. The introduction of the carbohydrate-vitamin-mineral concentrate «LS» in the diets of dairy cows for 30 days contributed to an increase in the name of bacteria by  $3.3 \pm 3.4\%$  and protozoa by  $6.7 \pm 4.1\%$ . In the cicatricial content of the experimental groups, the number of volatile fatty acids increased by  $12.4 \pm 2.4\%$  and propionic and butyric acids by  $3.4 \pm 3.1$  and  $5.7 \pm 2.7\%$  in relation to the control group of cows.



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### INTRODUCTION

Studies in the field of feeding dairy cattle breeding prove that diets are balanced in terms of nutrition due to compound feed concentrates, which include all the missing in the main diet (Oka and Suzuki, 1984; Brabander *et al.*, 2009). The use of premixes, mineral concentrates in the feeding of farm animals prevents the need to use or reduce the amount of fodder and animal feed, which greatly reduces the cost of livestock production (Viñas *et al.*, 2004).

Currently, farms are forced to use feed additives in

feeding farm animals instead of animal feed, due to their high cost. Typically, in such diets there is a deficiency of protein, minerals and vitamins, which reduces animal productivity and increases feed consumption (Cristina *et al.*, 2012; Zai *et al.*, 2013; Singh *et al.*, 2105).

In recent years, the production of feed additives in the form of premixes and other forms has decreased and they are not enough. Many domestic and foreign enterprises offer feed concentrates on the Russian market. Which have individual properties, they are used to increase milk yield, but this does not guarantee stability and retention of increased milk yield, which also makes it ineffective due to the increase in the cost of each kilogram of milk (Udalova *et al.*, 2015). The use of premixes and other vitamin-mineral components in the composition of compound feeds can also lead to hypervitaminosis. As a result, insufficiently worked out doses and uncontrolled administration of the supplement without taking into account the individual characteristics of the animal's biochemical blood tests based on the content of mineral substances can have a toxic effect and imbalance in the metabolic processes of the body (Singh *et al.*, 2105). This made it necessary to conduct experimental research on the development of recipes for protein-vitamin-mineral concentrates, feeds, mineral additives and premixes of local production in connection with which studies in this direction are relevant and have scientific and practical value (Carrasco-Pancorbo *et al.*, 2008; Mahmoudi *et al.*, 2014; Chilumuru *et al.*, 2015).

However, as practice shows, in a production environment, a weak feed base and poor feed quality leads to metabolic disturbances and a corresponding decrease in animal milk production.

In this regard, the purpose of this work was to study the metabolic processes in the rumen of ruminants, which studied the drug passed preclinical studies on laboratory animals

## MATERIALS AND METHODS

To study the effect on metabolic processes in the rumen of ruminants, a new recipe for carbohydrate-vitamin-mineral concentrate "LS" was first developed and tested in animal experiments, which was allowed to lick for 30 days on cows of the black and white breed.

For research, 2 groups of animals were formed, 8 animals each. The cows were selected on the basis of analogues, the control group received the main diet (vetch-oat silage, corn silage, alfalfa hay), and the animals of the experimental group received in

addition to the main diet to the will of UVMK "LS."

To study the intensity and direction of metabolic processes in the body of cows, samples of cicatricial fluid were taken from three animals from each group using a food probe 4 hours after morning feeding. The contents were investigated: pH value by electrometric method using a pH meter; the total concentration of volatile fatty acids (VFA) - butyric, propionic and acetic - according to the method of Markham; the total number of microorganisms and the number of ciliates is in the Goryaev chamber.

The resulting material was processed by the method of variation statistics, the reliability of the difference in values was calculated by Student.

## RESULTS AND DISCUSSION

Studies have shown that the use of milk cows carbohydrate-vitamin-mineral concentrate "LS," was accompanied by a change in the experimental group of the microflora of the rumen.

LFA, formed in the process of microbial fermentation from carbohydrates, absorbed through the epithelium of the pre-ventricles, provide at least 40-60% of the energy needs, create favorable conditions for bacteria. Propionic acid for ruminants is a source of glucose, and its precursor in the rumen is lactic acid. It is formed from easily digestible carbohydrates-sugars, starch, does not accumulate in the rumen and through transformation is converted into propionic acid.

The amount of LFA in the scar content of cows in the control group was low compared to the experimental group; the value of this indicator increased by  $12.4 \pm 2.4\%$ . The content of propionic and butyric acids in the experimental groups was slightly increased by  $3.4 \pm 3.1$  and  $5.7 \pm 2.7\%$  with respect to the control group of cows, the results of which are presented in Table 1.

Bacteria and protozoa in the rumen play an important role in the digestive processes of the pre-ventricles, a large number of microorganisms of the rumen are represented from the protozoa-very small flagellates and infusoria. The total number of microorganisms in the scar fluid of cows in the control group was  $7.1 \pm 2.7$  billion/ml, in the experimental group more-by  $3.3 \pm 3.4\%$ . The number of infusoria amounted to 583 thousand / ml was also higher in the experimental group by  $6.7 \pm 4.1\%$ .

## CONCLUSIONS

In the rumen of ruminants, due to their enzymatic breakdown of food nutrients, a complex fermenta-

**Table 1: Results of the study of the contents of the scar**

Indicator	Group of animals	
	test	experimental
Volatile fatty acids, mmol/100 ml	8,36±1,21	9,40±0,21
pH	6,42±0,14	6,51±0,11
Total number of microorganisms, billion / ml	7,91 ±2,14	8,1±3,81
The number of ciliates, thousand/ml	379,77±2,41	405,04±14,81

tion process occurs, which increases digestibility; therefore, an increase in their number contributes to the improvement of fermentation processes. The introduction of the carbohydrate-vitamin-mineral concentrate "LS" in the diets of dairy cows for 30 days contributed to an increase in the number of bacteria by  $3.6 \pm 3.4\%$  and protozoa by  $6.7 \pm 4.1\%$ . In the cicatricial content of the experimental groups, the number of volatile fatty acids increased by  $12.4 \pm 2.4\%$  and propionic and butyric acids by  $3.4 \pm 3.1$  and  $5.7 \pm 2.7\%$  in relation to the control group of cows.

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