УДК 637.11:636.

THE USE OF CHITOSAN SUCCINATE TO INCREASE THE MILK PRODUCTION OF COWS

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Increasing milk production, facing dairy workers is an important task, especially in areas with developed industry and a large percentage of the urban population [1].

The solution to this problem can be the use of biologically active substances in the feeding of dairy cows that stimulate metabolism in the body and simultaneously have a preventive effect [2]. One of these products is chitosan and preparations based on it. Studies of the use of chitosan in animal husbandry and poultry farming have been carried out. The study of the use of such drugs for dairy cows is relevant and of practical importance. Therefore, we set the task of studying the use of chitosan succinate with different molecular weights for black-and-white cows. Three groups of animals were selected by the method of balanced groups, taking into account age, productivity for the previous lactation, breed characteristics, live weight, etc., 15 heads each. During the study period, the animals were kept in the same conditions of feeding and keeping in accordance with zoohygienic requirements [3-6].

The first group of cows served as a control. The animals of the second group were treated with high molecular weight chitosan with a molecular weight of 487,0 kDa and a degree of deacetylation of 75,3%. The cows of the third group received low molecular weight chitosan succinate with a molecular weight of 38 kDa and a degree of substitution of 85%. The drugs were administered orally, together with concentrates, in the form of a 2% solution of 2,0 ml per 1 kg of live weight 2 times a day for seven days.

After 5 days, the administration was repeated. Milk productivity was assessed by control milking. Qualitative indicators of milk productivity by conventional methods.

Milk productivity of cows is the main selection characteristic in the selection of cows [7-9]. As a result of our studies on the use of chitosan succinate with different molecular weights for dairy cows, it was found that cows that received the supplement increased milk productivity with a simultaneous improvement in the quality indicators of milk (table 1).

Table 1.

Milk productivity of cows, kg

X±Sx, n=15

Index	Group		
	Control	Experienced I	Experienced II
Milk in 305 days of lactation	4583±138,7	5232±216,31	5633±123,20
MJ, %	3,78±0,02	3,83±0,03	3,93±0,03
MDB, %	3,21±0,002	3,34±0,003	3,31±0,004
The amount of milk fat	173±1,18	201±2,52	221±2,33
The amount of milk protein	147±1,14	175±1,43	186±1,86
Number of milk days	302±1,8	304±1,3	303±1,2
Milk during the research period	1027±53,83	1183±66,11	1258±49,18
Average daily milk yield	15,1±0,23	17,3±0,33	18,6±0,21

These tables allow us to conclude that the use of chitosan succinate increases the productivity of cows by 655 kg and 1050 kg, or by 14.3% and 22,9%. The difference is significant in favor of the experimental groups with $P \leq 0.05$ and P¨0.01. It should be noted that a significant difference at P¨0,05 was also obtained between the experimental groups in favor of the second group (low molecular weight chitosan succinate). This is confirmed by the achieved indicators of the average daily milk yield and milk yield during the experiment. Average daily milk yield in the experimental groups was higher by 2,2 kg and 3,5 kg, or by 14,6% and 23,2%, than in the control group (P¨ 0,01). A significant difference was also obtained between the experimental groups (P¨0,05). She was 1,3 kg, or 7,5% in favor of the second experimental group. The same trend is observed when assessing milk yield over the period of experience. In the experimental groups, more milk was received from the cows during the experiment period than in the control group by 186 kg (first experimental) and 221 kg (second experimental), or by 18,1% and 21,5%.

The difference between the experimental groups was small and amounted to 75 kg, or 6,3% in favor of the second experimental group. The use of chitosan succinate had a positive effect on the quality composition of milk. In the milk of cows of the experimental groups, the mass fraction of fat and protein increased. The difference is significant in favor of the experimental groups (P¨0,05; P¨0,01). The fat content in the milk of cows from the experimental groups increased by 0,05% and 0,15%, respectively, in the groups. The protein content was higher by 0,13% and 0,10%.

It should be noted that the mass fraction of fat increases more in the second experimental group, and protein in the first experimental group. From our point of view, the use of chitosan preparations has a positive effect on increasing milk productivity and improving milk quality, which, having ad-

sorbing and ion-exchange properties, improve metabolism in the body, including rumen and intestinal digestion. This led to an increase in milk yield and an improvement in the quality indicators of milk.

An increase in the mass fraction of fat and protein has led to an increase in the production of milk fat and protein, which are more isolated from the milk of cows in the experimental groups due to their high productivity. More milk fat and protein were released from the cows of the experimental groups with milk than the animals of the control group by 18 and 38 kg and 28 and 39 kg, respectively. The difference is significant at P 0,01 – P¨0,001 in favor of the experimental groups. A significant difference in the amount of milk fat and protein was also established between the experimental groups. With the milk of cows of the second experimental group, more milk fat and protein were released by 20 kg and 11 kg, respectively, or by 9,95% and by 6,3%.

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