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## THE EFFECT OF CANOLA MEAL APPLICATION IN THE DIET OF DAIRY COWS OF HOLSTEIN BREED IN BAYSERKE AGRO LLP

**Abstract.** The impact of canola meal on dairy productivity and qualitative indicators of milk in Holstein breed cows was studied under the conditions of Bayserke Agro LLP. The prime cost of milk was calculated with the inclusion of soybean cake and canola meal as well as the average dry matter intake in the diet when the nutritional breakdown of the experimental and control groups changed in a comparative aspect.

**Keywords:** soybean, canola flower, diet, fat, protein, NDF, ADC.

**Introduction.** Dairy productivity of dairy cows largely depends on provision with protein not decayed in rumen and formed by the microbial protein in the forestomachs and entered the bowel [1].

The provision with this protein at a sufficient level in accordance with the need for the productive capacity of cows is largely ensured by feeds with a high content of transit protein. The main protein feed is widely used in balancing the diet on protein of dairy cows in Kazakhstan is soybean in the form of a cake with the content of crude fat up to 10% and soybean meal up to 1.5%, protein - 35-40% or more. The generally accepted rate of adding soybean to the diet ranges from 100 to 150 grams per liter of products, while the highest fat content in milk without loss of volume is observed when using soybean meal. The only drawback of the use of soybean in balancing the diet of dairy cows according to protein is its relatively high cost, which greatly overestimates the prime cost of the final product since the main cost item in the diet accounts for protein feed.

In this regard, ways to reduce the diet cost without loss of dairy products, including fat and protein contents, are being sought. The main analogues are canola meal or press cake, which at the moment are much lower at market price, while the content of calcium, phosphorus, magnesium, and manganese exceeds soybean, and the optimal ratio of decayed and non-decayed protein ensures good development of rumen microflora. According to some scholars, the availability of calcium in canola is 68%, phosphorus - 75%, magnesium - 62%, manganese - 54%, copper - 74%, zinc - 44%. Canola also contains a significant amount of choline, niacin, riboflavin, folic acid and thiamine, and natural antioxidants like tocopherol, phenolic compounds, and tannins. In addition, it has good eating qualities providing excellent palatability when included in mono feeds [2].

**Methods of research.** Research work was carried out in a high producing herd of 132 animals, 3 groups of 44 heads each (1 experimental group and 2 control groups), milking was performed on a voluntary basis at the DeLaval robotic milking machine. Through the milking machine, the pelleted feed can be added through a feed unit at a rate of 100 grams per kg of milk up to 100 days of lactation, and 50 grams from 100 days or more of lactation each. The distribution of mono feed was conducted through a trailed horizontal feed mixer (DeLaval, 12 m<sup>3</sup> volume) 2 times a day with an interval of 8 hours. Chemical

examination of forage and qualitative indicators of milk was determined in Bayserke Agro LLP laboratory.

**Research results.** The research work was conducted on the base of the dairy unit of Bayserke Agro LLP, the main experimental breed was Holstein of Canadian breeding. The average milk yield at the time of the experiment averaged from 38 to 41 liters, depending on the cows entering the machine, which varies from 2.9 to 3.2, the fat and protein mass fraction in milk is an average 3.4% and 3.1% respectively.

**The aim of the research** is to study the effect of canola meal on the dairy productivity of Holstein dairy cows and cost reduction of milk in the nutritional breakdown.

According to the results of a chemical examination of feed, the dry matter content in the diet of the control group averaged 23.5 kg per animal, digestible protein - 3520 g, exchange energy - 282 MJ, NEL - 162 MJ, the total crude fiber content in the diet is 16%. Similar indicators in the diet of the experimental group amounted to 24.7 kg of dry matter per animal, 3548 g of digestible protein, 279 MJ of exchange energy, 158 MJ of NEL and 15.8% of crude fiber. The structure of the experimental diet has been modified for 12 days according to the parameters of mono feed palatability (daily remainder on the feeding table not less than 5%) and the qualitative indicators of milk, such as fat and protein, taking into account the ratio of fat to protein with a coefficient of not less than 1.1. Due to identical indicators of crude protein content in soybeans and canola, which accounted for 38% each, at the beginning of the experiment, soybean cake was replaced by canola meal without changing the proportion of dietary ingredients, but due to a sharp decline in productivity in the experimental group up to 36 kg per animal, a clear recalculation of the diet was carried out with further modifications, which resulted in the approval of the above diet structure.

Table 1 - Diet structure of dairy cows of the control and experimental groups, productivity - 38-41 kg

| Name of feed                                      | Control group | Experimental group |
|---|---------------|--------------------|
| Corn  | 2.2           | 3.3                |
| Barley  | 4.6           | 4                  |
| Soybean cake                                      | 3.6           | -                  |
| Canola meal                                       | -             | 4.54               |
| Pelleted combined feed (through the feed station) | 2.2           | 2.2                |
| IN-R 18 premix for dairy cattle                   | 0.17          | 0.17               |
| Tricalcium phosphate                              | 0.2           | 0.2                |
| Alfalfa haylage                                   | 8.4           | 5.8                |
| Corn silage                                       | 24.4          | 27.4               |
| Total   | 45.8          | 47.6               |

As a result of changes in the diet of the experimental group, the consumption of dry matter per animal increased by an average of 1.2 kg, from 23.5 to 24.7 kg, which is caused by a decrease in the content of neutral detergent fiber in the diet of the experimental group by 1.2%, from 25.6% to 24.4%. According to a number of researchers, a decrease in neutral detergent fiber in the diet leads to an enhancement in dry matter intake, but they also noted a reduction in the mass fraction of fat in milk [3]. It was found that the optimal case of the neutral detergent fiber content in the diets of dairy cows during the second phase of lactation is from 32.0 to 37.0% and the acid detergent fiber content is from 25.0 to 25.5% of the dry matter in the diet with productivity up to 25 kg, to ensure a high level of dairy production, the content of fat and protein mass fraction, and the best recovery of fatness after high milk yield[4]. In this connection, the high-priority task is to increase the proportion of neutral detergent fiber in the diet to 26% in order to improve the qualitative indicators of milk, including fat content up to 3.6-3.7% and protein of not less than 3.2%. The solution to this problem is possible by adding beetroot pulp or soybean peel to the diet, the input rate of which, according to preliminary calculations, averages 1.2-1.4 kg per animal. The obtained data on the enhancing milk yield are not inferior to those in other farms of the Almaty region with Black-and-motley and Holstein black-and-white dairy cattle breeds [5, 6, 7].

As can be seen from Table 2, the average productivity of animals in the experimental and control groups was 40.8 and 40.3 kg per cow, respectively, but there was a decrease in fat and protein in the experimental group by 0.07% and 0.08%.

Table 2 - Indicators of dairy productivity of cows over the research period (90 days)

| Indicators                                      | Group        |           |
|---|--------------|-----------|
|   | Experimental | Control   |
| Total registered animals                        | 44           | 88        |
| Gross yield per animal, kg                      | 2774.4±92.8  | 2741±68.9 |
| Average per animal, kg                          | 40.8±0.95    | 40.3±1.3  |
| Fat mass fraction, %                            | 3.36±0.9     | 3.43±0.7  |
| Protein mass fraction, %                        | 3.04±0.08    | 3.12±0.07 |
| Prime cost in the diet structure, per 1 kg. tg. | 58.2         | 73.1      |

Taking into consideration that milk sales are based on primary fat content (3.6%), the average productivity of the experimental group animals when transited to the basis was 38.08 kg and in the control group - 38.4 kg, but at the same time the prime cost of 1 kg of milk in the diet structure of the experimental group was lower by 20.4% than in the control one. As the state of the animals of the experimental group in relation to the control group, a difference is not marked.

**Conclusions.** In such a way, according to the research results, the possibility of preserving dairy productivity and enhancing profitability was shown using in the diet of dairy cows of canola meal as a protein feed. The average consumption of canola meal per 1 kg of products per diet averaged 110 grams, while the difference in the set of feed in the diets caused a change in the intake of dry matters between the groups.

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**“БАЙСЕРКЕ АГРО” ЖШС ГОЛШТИНСКИЙ ТҰҚЫМДЫ  
САУЫН СИЫРЛАРЫНЫҢ РАЦИОНЫНДА  
РАПС КҮНЖАРАСЫН ҚОЛДАНУ НӘТИЖЕЛЕРІ»**

**Аннотация.** “Байсерке Агро” ЖШС жағдайында рапсты күнжараның сүт өнімділігіне және голштин тұқымды сауын сиырларының сүтінің сапалық көрсеткіштеріне әсері зерттелді. Соя күнжарасы мен рапс күнжарасын рационға қосқан кездегі сүттің өзіндік құны мен тәжірибелік және бақылау тобының рационның құрылымы өзгергенде құрғақ заттың орташа тұтынуы салыстырмалы аспектіде есептелген. Зерттеу жұмысының қорытындысы бойынша сүт өнімділігін сақтау және рентабельділікті жоғарылату мүмкіндігі рапс дәмін диетада сүт сиырларын ақуыздық жем ретінде пайдалану есебінен көрсетті. Орташа тұтыну рапс жүні 1 кг-ға азық-түлік өнімдері орта есеппен 110 грамм, ал рациондардағы азықтардың жиынтығындағы айырмашылық топтар арасында құрғақ заттардың өзгеруіне әкелді.

**Түйін сөздер:** соя, рапс, рацион, май, ақуыз, нейтральді-детергенттік клетчатка, қышқыл-детергенттік клетчатка.

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**РЕЗУЛЬТАТЫ ПРИМЕНЕНИЯ РАПСОВОГО ШРОТА  
В РАЦИОНЕ ДОЙНЫХ КОРОВ ГОЛШТИНСКОЙ ПОРОДЫ  
ТОО «БАЙСЕРКЕ АГРО»**

**Аннотация.** Изучено влияние рапсового шрота на молочную продуктивность и качественные показатели молока дойных коров голштинской породы в условиях ТОО «Байсерке Агро». Рассчитана себестоимость молока при включении в рацион соевого жмыха и рапсового шрота и среднее потребление сухого вещества при изменении структуры рациона опытной и контрольной группы в сравнительном аспекте.

**Ключевые слова:** соя, рапс, рацион, жир, белок, НДК, КДК.

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