International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075 (Online), Volume-9 Issue-2, December 2019

# Efficiency of the New Fodder Additive for the Production of Lamb

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***Abstract*: *This article presents material on the study of the efficiency of raising Edilbayev sheep using a new feed supplement and assesses its effect on increasing the meat productivity of animals and improving mutton indices. To do this, we at Volgograd-Edilbay SGC LLC selected 30 animals of the Edilbayev breed of 7 months of age in two experimental groups according to the principle of pair-analogues with 15 animals each. The rams who received the standard diet were included in the control group, and their analogues, which were introduced a new feed additive in the diet, were included in the experimental group. The duration of the experiment was 105 days. In this case, the preparatory period of the experiment is 10 days, the transitional period is 5 days, the main one is 90 days. As a result of the experiment, it was found that at the end of the experiment, the rams of the experimental group exceeded their counterparts in the control group in live weight by 2.9 kg, or 5.72% (P≥0.999). As a result of the control slaughter, it was established that by the pre-slaughter mass, the rams of the experimental group are 1.65 kg or 3.35% more than analogues of the control group (P≥0.95); weight of fat tail fat - by 0.35 kg, or 13.21%; slaughter mass - by 1.49 kg, or 5.23% (P≥0.99); slaughter yield - by 1.09%, respectively. A study of the chemical composition of lamb showed that in the content of the rams of the experimental group in the meat, iodine was 0.08 μg / g more than the analogues of the control group (P≥0.95); silicon - at 3.92 μg / g; selenium - at 0.12 μg / g (P≥0.99); zinc - at 6.0 μg / g, respectively. According to the content of fatty acids, tail fat obtained from animals of the control and experimental groups differs in favor of the experimental group. Saturated fatty acids in turkey fat of animals from the experimental group contain 61.34%, which is 3.22% higher in comparison with the control group. Unsaturated fatty acids in animals of the experimental group contain 38.66%, which is 3.17% less in comparison with the control group. Thus, the highest results in meat productivity, chemical composition, and the amount of saturated and unsaturated acids were obtained from edilbaevsky rams that received a new feed supplement.*

***Keywords*: *rams, lamb, fat, fat tail, chemical indicators, saturated and unsaturated fatty acids*.**

**Revised Manuscript Received on December 30, 2019.**

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## I. INTRODUCTION

The development of the sheep husbandry industry is one of the directions for implementing the state program of the Government of the Russian Federation “Development of agriculture and regulation of agricultural products, raw materials and food markets” until 2020. At the same time, one of the important roles in providing the country's population with livestock products obtained from alternative livestock production is assigned to the sheep industry.

The Volgograd region has unique agrobiocenoses with rather significant differences from semi-deserts to the meadow steppe. On the territory of the Lower Volga region there is a favorable species set of herbs that is readily eaten by sheep. Among them: kohiya, white gauze, horned lamb, meadow rank, alfalfa, astragalus, medicinal thistle, chamomile, and many others.

A distinctive feature of the sheep of the Edilbayevskiy fat tail breed is their kololost and high adaptability to various sharply changing climate conditions. They have a black or red color, are characterized by the correct physique. A specific feature is the presence of fat tail - fat deposits located in the tail region, weighing about 7 kg in adult animals. He is appreciated in cooking. The weight of adult rams is 110 kg, and that of queens is 70 kg. Recordists by the age of one year reach a live weight of 100 kg.

The most important link for the most complete manifestation of the genetic predisposition of animals to their maximum productivity is full-ration feeding, balanced for all nutrients. One of the limiting factors in the feeding of rams grown in the Lower Volga region is the presence of macro- and microelements in their diets, including iodine, selenium and silicon. The use of trace elements in organic form can significantly increase the effectiveness of their influence on increasing the productivity of animals.

On the territory of the Bykovsky district of the Volgograd region there is the only breeding and genetic center in Russia for the breeding of the Edilbayev breed of sheep on the basis of LLC Volgograd-Edilbay SGC.

Particularly noteworthy is the question of studying the productivity of Edilbaevskiy fat tail sheep when using a new feed supplement containing organic forms of iodine, selenium and silicon.

The aim of the research was to establish the effect of a new feed additive in animal feeding diets on increasing the meat productivity of sheep and increasing the quality indicators of lamb.

## II. MATERIAL AND RESEARCH METHODS

Research work was carried out in the breeding and genetic center for the breeding of Edilbayev sheep of the Volgograd-Edilbay LLC, Bykovsky District, Volgograd Region.For this, we selected 30 animals of the Edilbayev breed of 7 months of age in two experimental groups on the basis of the pair-analogs principle with 15 animals each. The rams who received the standard diet were included in the control group, and their analogues, which were introduced a new feed additive in the diet, were included in the experimental group. The duration of the experiment was 105 days. In this case, the preparatory period of the experiment is 10 days, the transitional period is 5 days, the main one is 90 days.The new feed additive, containing organic forms of selenium, iodine and silicon, is a free-flowing powder consisting of diacetophenone selenide (DAFS-25), iodinated milk proteins (IODDAR-Zn), amorphous silica (Coretron) and pumpkin meal obtained by the method cold pressing.

Individual weighing of experimental animals, carried out to establish live weight, was carried out monthly.

Control slaughter of experimental young animals was carried out on 5 rams from each group after 24-hour exposure (VASKHNIL, 1977).

The study of the physiological state of experimental animals was determined during the selection of blood from 5 animals from the group. Blood from experimental rams was taken from the jugular vein. In the blood, the content of red blood cells and leukocytes in the Goryaev's chamber was determined. The hemoglobin content in the blood of animals was determined by the Sali method. The results of the analysis of the absorption and digestion abilities of neutrophils and the process of phagocytosis determined the level of natural resistance of experimental animals.

Accounting for the level of amino acids in meat of rams was determined using the method of capillary electrophoresis on devices "Drops 105 / 105M" and amino acid analyzer (L-8800, "Hitachi", Ltd) .. Assessment of the biological usefulness of meat was determined by the content of amino acids in it according to the method developed by academician Lipatov N.N.

The content of saturated and unsaturated fatty acids (oleic, stearic, linolenic, palmitic, arachidonic, linoleic, etc.) in the meat and fat of edilbaevsky sheep rams was determined based on biochemical studies.

The results of the experimental work were processed using methods of variation statistics on a PC with the establishment of criteria for the reliability of the difference developed by Student-Fisher.

## III. RESULTS AND DISCUSSIONS

Weighing of experimental rams of the Edilbaev breed showed that at the beginning of the experiment, the average live weight of the experimental young of the control group was at 35.70 kg, and for the analogues of the experimental group - 36.4 kg with an unreliable difference.

**Table 1 – Dynamics of live weight of experimental young animals(n=15)**

| Age, months | Group | |
|---|---|---|
| | Controlled | Experienced |
| 4 | 35.70±0.30 | 36.40±0.45 |
| 7 | 47.80±0.34 | 50.70±0.33 *** |

As a result of the experiment, it was found that at the end of the experiment, the rams of the experimental group exceeded their counterparts from the control group in live weight by 2.9 kg, or 5.72% (P≥0.999).

The study of the meat qualities of rams was carried out on the basis of the control slaughter of experimental young animals with 5 goals from each group.

**Table 2 –Control slaughter of rams of the Edilbayev breed (n=5)**

| Group | Group | |
|---|---|---|
| | Controlled | Controlled |
| Slaughter live weight, kg | 47.65±0.42 | 49.30±0.37* |
| Weight of fat tail, kg | 2.30±0.12 | 2.65±0.14 |
| Slaughter weight, kg | 27.0±0.23 | 28.49±0.34** |
| Slaughter yield,% | 56.70 | 57.79 |

Table 2 shows that a result of the control slaughter in the pre-slaughter mass, the rams of the experimental group are 1.65 kg or 3.35% more than analogues of the control group (P≥0.95); weight of fat tail fat - by 0.35 kg, or 13.21%; slaughter mass - by 1.49 kg, or 5.23% (P≥0.99); slaughter yield - by 1.09%, respectively.The presented experimental studies on meat productivity and slaughter indicators show that animals that received a new feed additive in the diet were more efficient in converting feed nutrients into livestock products.To conduct a study of the chemical composition of meat by the content of iodine, selenium, and silicon elements introduced with a feed additive, lamb samples were taken from each right half of the carcasses of experimental animals (table 3).

**Table 3 –The chemical composition of mutton obtained from animals at 7 months of age (n=5)**

| Indicator | Group | |
|---|---|---|
| | Controlled | Controlled |
| Selenium, mcg / g | 0,22±0,016 | 0,34±0,024 |
| Silicon, mcg / g | 27,34±1,89 | 31,26±2,14 |
| Iodine, mcg / g | 0,15±0,029 | 0,23±0,0017 * |
| Zinc, mcg / g | 29,67±1,96 | 35,67±2,34 |

As can be seen from table 3, the data showed that the content in the meat of the rams of the experimental group of iodine contained more than 0.08 μg / g in comparison with the analogues of the control group (P≥0.95); silicon - at 3.92 μg / g; selenium - at 0.12 μg / g (P≥0.99); zinc - at 6.0 μg / g, respectively.

It is known that the fat content in meat has a significant impact on its quality. Fats in their calorific value significantly exceed proteins and carbohydrates, but the need for them in different people is determined by age, constitution, occupation, physiological condition, climatic features of the area, etc. On average, per person, the consumption of fats with food for people is 100 g, taking into account the average load. It is considered optimal when the amount of animal fat consumed is 70%, and vegetable fat 30%.

Therefore, it is very important to conduct research aimed at studying fats, including those contained in fat tail. After slaughter in mutton fat, hydrolysis begins,

that is, the breakdown of fats, which can lead to spoilage of the product: the process of salting fat or rancidity can go on. One of the most important indicators characterizing the quality of fat is the acid number (KOH, mg), which shows the amount of free fatty acids separated from glycerin. The peroxide value of lamb fat, or the amount of iodine in 0.1 kg of fat released from potassium iodide solution by peroxides in fat was also determined. In lamb fat of good quality, the peroxide value is from 0.0 to 0.006, and in stale fat from 0.006 to 0.1. Fat with a peroxide value of more than 0.1 is not used in food (table 4).

**Table 4 - Qualitative indicators of the fat tail fat of experimental rams (n=5)**

| Acidity | Acidity number | Perexide value | Acidity | Acidity number | Perexide value |
|---|---|---|---|---|---|
| Control group | | | Experience group | | |
| 5.84 ±0.02 | 1.76 ±0.05 | 0.,02 | 5.87 ±0.03 | 1.81 ±0.01 | 0.03 |

As can be seen from the presented data, fat tail fat obtained from animals of the control and experimental groups can be classified as first-class in terms of acid number.According to the content of fatty acids, tail fat obtained from animals of the control and experimental groups differs in favor of the experimental group. Saturated fatty acids in turkey fat of animals from the experimental group contain 61.34%, which is 3.22% higher in comparison with the control group. Unsaturated fatty acids in animals of the experimental group contain 38.66%, which is 3.17% less in comparison with the control group.

## IV. CONCLUSION

Animals of the Edilbayev breed, which received a new feed additive as part of the rations, had a higher live weight, increased slaughter qualities compared to the analogues of the control group. According to the content of iodine, selenium and silicon, the mutton obtained from the rams of the experimental group was characterized by a higher content in comparison with the control group. In addition, the fatty fat obtained from them was characterized by a balanced composition of saturated and unsaturated fatty acids.

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## ACKNOWLEDGMENT

The presented article was completed as part of a grant from the President of the Russian Federation № MK-3731.2018.11.

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