Features of the formation of quality indicators ram edilbay breed in arid conditions

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Annotation. Purpose: The purpose of the presented research is to establish the influence of natural pastures of the arid zone of the Volgograd region on the formation of meat productivity of rams of different types of edilbay breed. Methodology: The studies were carried out using modern mathematical-statistical methods for processing experimental data. Concrete recommendations are given to increase the production of mutton received from sheep of the edilbay breed and to improve its quality indicators. Results: Experimental studies continued for 10 months. For the entire period of the experiment, in terms of body weight, the rams of the new type (78.50 kg) were larger than the animals of the original type (74.20 kg) by 4.3 kg, or 5.79%. Amino acid analysis of the longest muscle of the back of experimental rams showed that the total amount of amino acids contained in mutton obtained from animals of the new type, irreparable, was 8.08%, which is higher compared to the analogs of the initial type by 0.47%. According to the content of replaceable amino acids in mutton, the same tendency was observed for the superiority of mutton obtained from animals of a new type as compared to the original type. A comparative study of the chemical composition of mutton has shown that animals of a new type exceed the indicators of the original type in calcium content (Ca) by 3.64 µg / g; iron (Fe) at 1.32 µg / g; iodine (I) at 0.04 µg / g; potassium (K) at 140 µg / g; manganese (Mg) at 14 µg / g; selenium (Se) at 0.02 µg / g. Recommendations: The experimental work carried out has shown that animals of a new type not only increase their live weight faster, but also accumulate much more elements entering the body, and also increase the nutritional value of mutton due to a higher accumulation of amino acids in its structure. Therefore, in the future, in order to increase the production of mutton and improve its quality, it is necessary to use animals of the Edilbay breed of a new type.

Keywords: sheep breeding, edilbay breed of sheep, mutton, mutton, natural pastures, arid lands, slaughter indicators.

1. Introduction
In Russia, one of the most important issues is to provide the population of the country with high-quality food products of animal origin. Food products derived from lamb, have a number of valuable qualities: low-calorie, digestibility, high nutritional value and rare culinary properties, and also contain in their composition vitamins, minerals, essential and non-essential amino acids, biologically active components – conjugated linoleic acid and carnitine. Lamb can be used in dietary food, and is also used in food in
countries with any religious orientation, which makes research aimed at increasing its production and quality improvement, especially in demand [1, 2].

Young lamb is an excellent raw material used for the production of high-protein products, as it contains a special (specific) fat, characterized by a small amount of stearic complex, which has special taste and nutritional qualities. The composition and taste properties of lamb strongly depend on the breed of sheep and the quality of feed consumed by animals [3, 4].

Sheep edilbay breed attributed to coarse-haired coarse, but on the growth maturity and a number of parameters of meat productivity, it can compete with the sheep of English meat and wool breeds. Animals of this breed have high value qualities: high precocity at a young age; poor use of poor pastures of desert, semi-desert and dry-steppe zones in different seasons of the year; able to transmit to progeny their economically useful traits as in purebred breeding, and when crossed with other fat-tailed sheep [4].

Efficient livestock production in arid areas is difficult not only from the point of view of the need for careful rational use of cheap natural rangelands, but also with balancing the rations of animals for all nutrients by introducing new fodder and biologically active additives. The physiological state of animal health is greatly influenced by the level of availability of necessary food to them, depending on the breed, origin, and conditions of detention. The development of the genetic potential of the organism of animals in the process of ontogenesis directly depends on the feeding factors (excess or lack of nutrients). The level of adaptation of animals is determined by the specific place of birth, as well as the genetic characteristics of the parental genotypes, which is of great importance for the formation of productivity of farm animals. The territories of Russia, characterized by arid climate, include 6 economic regions, consisting of 13 republics, 4 territories, 17 regions and one autonomous region in the Central Black Soil, Volga region, Western and Eastern Siberia, in the North Caucasus and the Urals. Under the highly arid territories of the Astrakhan Region, the Republic of Kalmykia, the northern part of the Republic of Dagestan, the south of the Volgograd and Saratov Regions, and the east of the Stavropol Territory, there are about 8.7–13.1 million hectares. Saratov Region, Stavropol Territory, Republic of Chechnya, Rostov Region, Altai Territory, Novosibirsk and Orenburg Regions with a total area of 21.2-26.8 million hectares. Therefore, it is necessary to study the productive features of breeds of animals that can effectively use natural low-productive pastures [3-5].

The Bykovsky district of the Volgograd region is located at the north-western end of the Caspian lowland. The vegetation cover of the Caspian lowland within the Volgograd region can be conditionally attributed to the black-wormwood and black-wormwood-camomile semi-deserts. On sodic soils black wormwood grows, perennial hodgepodge. Also there are areas rich in such plants as: comb groats, fescue, Tyrsa and Lessing feather grass, wormwood, Russian bedwatch, yellow alfalfa and many others. It should be noted that in the herbage of the steppe zone there are about 100 plant species. These areas are characterized by a sharp continental climate, which leads to high temperatures in summer and low in winter, sharp gusts of wind. However, it is necessary to take into account that the edilbayevesky breed of sheep was bred on the territory of Kazakhstan, where there are even more severe climatic conditions [6-11].

Animals of edilbay breed have black or red color, brown is rarely found, have the correct development of the backbone. Among the features of this breed, it should be noted that they are.

2. Materials and methods of research

The studies were conducted on the basis of the selection and genetic center of Volgograd-Edilbay, LLC, Bykovsky district, Volgograd region. For this purpose, we have formed two groups of rams of the Edilbaey breed at the age of 2 months, 15 heads in each. Groups of experimental animals formed on the principle of steam analogues. In the control group, animals of the initial type of the Edilbaey breed were selected, and in the experimental group - rams of a new type.

The study of the dynamics of body weight was performed using monthly individual weighings.
Slaughter indicators were determined on the basis of data obtained after control slaughter of animals. For this, 5 animals from each group were selected. The control slaughter of rams was carried out according to the method of the Academy of Agricultural Sciences (1977).

The physiological state of the experimental animals was monitored by the results of hematological parameters obtained from experimental animals. Blood was taken from the jugular vein. The content of erythrocytes and leukocytes in the blood of the experimental rams was determined in the Goryaev chamber, and hemoglobin was determined by the Sali method. The natural resistance of the organism to the experimental rams was assessed by the absorptive and digestive capacity of neutrophils and total phagocytic activity.

The quantitative content of amino acids in the meat of the experimental rams was determined by capillary electrophoresis using the Kapel 105 / 105M instrument and the Aracus amino acid analyzer in the laboratory of Volgograd State Technical University.

According to the method proposed by Academician Lipatov NN, the biological usefulness of meat was established on the basis of the content of essential nonessential amino acids.

The experimental data presented in the paper were processed by modern mathematical and statistical methods with the determination of the criterion of the reliability of the difference by the Student-Fisher method with three levels of probability.

3. Results

The monitoring of fodder crops of the Bykovsky district of the Volgograd region in the grazing zone of rams of the Edilbay breed of the breeding plant LLC Volgograd-Edilbay showed that the quantitative and qualitative composition of the forage lands of the region allows providing animals with all the necessary fodder.

One of the most important conditions for determining the quality of the forage base of natural pastures is the analysis of their botanical composition, which makes it possible to determine the possibility of raising animals and conduct an in vivo assessment of the meat qualities of lamb.

Significant changes in the composition of crop rotation in natural pastures appear as a result of jumps in the yield of forage lands in direct proportion to changes in climatic conditions.

The natural fodder lands of the Volgograd Trans-Volga region abound in the following types of feed: kohia, white mary, horned lead, meadow rank, alfalfa, astragalus, sow thistle, chamomile, fenugreek, and many others. It should be noted that these types of grass are eagerly eaten by sheep during all periods of their growing season.

The natural pastures of the Volgograd Trans-Volga region are characterized mainly by grass, fescue-wormwood, and feather grass types, and even meadow grass in the estuary irrigation areas. They number from 10 to 20 species.

The analysis of the chemical composition of natural forage lands was carried out, which showed that the protein content in spring reaches 133 g, and in winter - 72 g. It should be noted that the rather low protein content in winter time on natural pastures should be accompanied by giving concentrated feed to increase production raw meat. The high fiber content in winter feeding rations has a beneficial effect on the gastrointestinal tract of sheep. As a rule, by the beginning of the winter season, animals reach maximum fatness during the pasture period.

The purpose of the research is to establish the influence of natural pastures of the arid zone of the Volgograd region on the formation of meat productivity of rams of different types of edilbayevsky breed.

4. Research results

The studies were conducted in Volgograd-Edilbai LLC of the Bykovsky district of the Volgograd region. For this, two groups of experimental sheep of 60 days of age were selected, 15 animals each, on the principle of pairs-analogues. The first group includes sheep of the original type edilbay breed with a live weight of 28.2 kg, and the second group includes animals of a new type with a live weight of 28.4 kg.
Experimental studies continued for 10 months. For the entire period of the experiment, in terms of body weight, the rams of the new type (78.50 kg) are larger than the animals of the original type (74.20 kg) by 4.3 kg, or 5.79% (P≥0.99).

In order to establish the meat qualities of the sheep of the edilbay breed, we carried out a control slaughter of experimental sheep-rams. For this, 5 typical animals were selected from each group (Table 1).

| Indicator                        | Initial          | New              |
|----------------------------------|------------------|------------------|
| Pre-slaughter live weight, kg     | 74.20±0.67       | 78.50±0.72**     |
| Mass of steam ink, kg            | 33.42±0.47       | 36.46±0.52*      |
| Mass of internal fat, kg         | 1.12±0.05        | 1.18±0.03        |
| Mass of tail fat, kg             | 10.2±0.12        | 10.4±0.14        |
| Slaughter weight, kg             | 44.74±0.23       | 48.04±0.34**     |
| Slaughter yield, %               | 60.30            | 61.20            |

As a result of the control slaughter of the rams, it was established that animals of a new type exceeded indicators of analogues of the original type by pre-slaughter weight by 5.79% (P≥0.99); the mass of the steam carcass - by 9.10% (P≥0.95); the mass of internal fat - by 11.11%; slaughter weight - by 3.58% (P≥0.99); fat tail - by 1.96%; slaughter yield - by 0.90%, respectively.

It should be noted that in almost all the slaughter indicators under study, a new type of baranchik’s advantage over the original type counterparts has been established, which indicates a higher level of metabolic processes in their body.

The nutritional value of lamb directly depends on the content of the complex of amino acids in it. It is known from literary sources that the longest muscle of the back is the so-called litmus paper, which characterizes the chemical and biochemical composition of the meat of the whole carcass. Amino acid analysis of the longest muscle of the back of the experimental rams showed that the essential amino acid lysine in the muscle of the back of the rams of the new type contains more than the original type analogues by 0.17% (1.86%); histidine - by 0.04% (0.56%); methionine - by 0.11% (0.39%); arginine - by 0.06% (0.94%); threonine - by 0.08% (0.67%); valine - by 0.17% (0.78%); isoleucine, by 0.07% (0.85%); leucine - by 0.16% (1.42%); phenylalanine - by 0.08% (0.61%), respectively. The total amount of amino acids contained in mutton, obtained from animals of the new type, was irreplaceable and contained 8.08%, which is higher compared to the analogs of the initial type by 0.47%. According to the content of replaceable amino acids in mutton, the same tendency was observed for the superiority of mutton obtained from animals of a new type as compared to the original type.

A comparative study of the chemical composition of mutton has shown that animals of a new type exceed the indicators of the original type in calcium content (Ca) by 3.64 µg / g; iron (Fe) at 1.32 mg / g; iodine (I) at 0.04 µg / g; potassium (K) at 140 µg / g; manganese (Mg) at 14 mg / g; selenium (Se) at 0.02 mg / g (table 2)
Table 2. The chemical composition of lamb (mg / g)

| Element | initial type | new type | changes |
|---------|--------------|----------|---------|
| Ca      | 60.33±6.03   | 63.97±6.03 | +3.64   |
| Fe      | 22.16±2.22   | 23.48±2.22 | +1.32   |
| I       | 0.71±0.085   | 0.75±0.085 | +0.04   |
| K       | 2343.00±234  | 2483.00±234 | +140.00 |
| Mg      | 247.00±25    | 261.00±25  | +14.00  |
| Se      | 0.21±0.025   | 0.23±0.025 | +0.02   |

Thus, the superiority of animals of a new type over analogues of the original type in the content of certain elements in meat was established. This confirms a higher level of metabolic processes occurring in their body.

5. Conclusions
The experimental work carried out has shown that animals of a new type not only increase their live weight faster, but also accumulate much more into themselves the elements entering the body, and also make it possible to increase the nutritional value of mutton due to a higher accumulation of amino acids in its structure. Therefore, in the future, in order to increase the production of mutton and improve its quality, it is necessary to use animals of the Edilbayevsky breed of a new type.

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