UDC: 636.088.5

SCIENTIFIC BASIS FOR INCREASING MEAT PRODUCTIVITY OF HISSAR LAMBS

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Abstract. *The article analyzes the effects of supplementary feeding on increasing the meat productivity of Hissar lambs, as well as the growth and development of experimental animals, and the relationship between biologically active substances in blood serum and meat productivity.*

Keywords: *productivity, energy, biological potential, protein, hematological parameters, carbohydrates, proteins, hormones, protein, vitamins, macro- and microelements, erythrocytes, leukocytes, hemoglobin.*

Introduction. An important factor in the growth and development of animals is the intensity of biochemical processes, which perform essential functions in all tissues and organs of a growing organism. The scientific basis for increasing meat productivity in animal husbandry lies in the effective use of the biological characteristics of Hissar sheep. In karakul breeding, increasing meat production is achieved by utilizing aged, unproductive karakul sheep, culled rams, and lambs with low-quality pelts that do not meet market requirements, through grazing combined with supplementary feeding. In this process, pasture capacity, climatic conditions, and pasture productivity are taken into account [1,5]. For the development of karakul sheep breeding, it is considered effective to preserve and reproduce only highly productive breeds capable of producing competitive products for global markets. Therefore, rational use of natural pastures and supplementary feeding create opportunities to increase meat productivity in karakul farming. In desert regions, increasing meat production is effectively achieved by utilizing the biological potential of animals raised for meat purposes. Providing the population with high-quality meat products remains one of the most pressing issues today [4,6,7].

All nutrients contained in food products can be conditionally divided into three groups: those that meet the body's energy requirements, those involved in the formation of cells and tissues, and those regulating metabolic processes. Accordingly, feed contains all three categories of nutrients: carbohydrates and fats (first group), proteins

and hormones (second group), and micro- and macroelements, vitamins, and enzymes (third group) [2,5].

In karakul sheep breeding, lambs whose pelt quality does not meet market demands are mainly raised for meat production. Early fattening of such animals brings significant economic benefits to farms. If low-quality lambs are kept for longer periods, feeding costs, veterinary services, and increasing pasture load lead to pasture degradation. As expenses rise, the quality of meat products does not proportionally improve, resulting in economic losses for the farm [3,8].

Research Methodology. For the study, Hissar sheep of average live weight raised in different ecological regions were selected. Quantitative indicators of biologically active substances in the blood, as well as milk productivity of sheep, were examined using generally accepted biological methods. The obtained results were analyzed biometrically using the method of N.A. Plokhinsky.

Conclusion and Recommendations. The growth and development of young animals are directly dependent on hematological parameters in the organism. In addition, growth and development are closely related to environmental factors, housing conditions, feeding practices, feed preparation, and the biological value of feed. In sheep breeding, meat products are generally classified as follows: lambs slaughtered at 1–3 days old are considered karakul (astrakhan) meat; lambs aged 4–4.5 months produce young (tender) meat; one-year-old animals produce yearling meat; and animals older than one year are classified as mutton. One of the most effective methods for increasing meat productivity in sheep farming is supplementary feeding. To study the effect of feeding on meat productivity, animals were selected into experimental and control groups based on similarity in age, physiological condition, and fatness level.

Supplement composition for experimental animals

Component	Barley	Wheat bran	Bran	Total	Per 1 kg
Amount, kg	37,0	13,0	50,0	100,0	1,0
Feed units	0,40	0,18	0,37	95,0	0,95
Metabolizable energy, KJ	3,92	1,86	4,77	1055	10,55
Dry matter, g	297,5	127,5	425	85000	850
Crude protein, g	39,5	10,44	76,5	12650	126,5
Digestible protein, g	29,7	8,85	56	9450	94,5
Vitamins, g	0,17	0,15	1,3	162	1,62
Macro and microelements, g	1,75	0,51	5,45	771	7,71

The experimental group was provided with additional feeding based on a high-protein diet, while the control group was fed according to the standard farm ration.

In countries with developed karakul sheep breeding such as Australia, New Zealand, Bulgaria, and England, meat production is carried out by fattening lambs aged 6–8 months. Experiments aimed at utilizing the biological potential of fattening karakul lambs with low-quality pelts were conducted at the "Bobotog-Suri" Limited Liability Company. The experimental and control groups were raised under identical pasture conditions. The experimental group received supplementary feeding. During the first 10 days, supplementary feeding was provided once a day together with their mothers. Subsequently, the feed amount was increased by 20%, and the lambs were separated from their mothers and fed twice a day. The growth and development indicators of lambs in both groups were monitored at the ages of 4–4.5 months and 8.0 months.

Meat productivity indicators of lambs in the experiment, kg

Lamb group	n	Growth and development					
		2,5 months old		4 – 4,5 months old		8 months at slaughter	
		M±m	C_v	M±m	C_v	M±m	C_v
Experimental	8	14,38±0,58	5,25	24,3±0,47	7,12	16,54±0,45	5,32
Control	8	14,29±0,32	5,59	21,4±0,31	8,03	14,38±0,87	5,89

Note: Significance: **P<0,01**

Lambs in the experimental and control groups were reared under identical pasture conditions, and animals with similar live weight and coat color were selected based on the principle of analogy. According to the data presented in Table 6.6.1.3, no significant differences in live weight between the experimental and control group lambs were observed at the age of 2–2.5 months. This result is statistically highly significant ($P < 0.001$). After the introduction of supplementary feeding starting from 4.0–4.5 months of age, it was determined that the live weight of lambs in the control group reached 21.4 kg (16.0%), while in the experimental group it reached 24.3 kg (18.7%), indicating a higher level in the experimental group. At the time of slaughter, meat yield in the control group lambs amounted to 14.38 kg (14.8%), whereas in the experimental group it reached 16.54 kg (12.4%). The average difference was found to be 13.4%. These results demonstrate that the growth rate potential during the fattening period was more pronounced in the experimental group lambs. The differences were confirmed to be statistically significant.

Correlation of biologically active substances in blood serum with meat productivity when supplemented (n=8)

Biologically active substances	Growth and development							
	2,5 months old		4 – 4,5 months old		6 – 6,5 months old		At 8 – month slaughter	
	M±m	Cv	M±m	Cv	M±m	Cv	M±m	Cv
Experimental group								
AcAT	42,8±11,5	4,29	43,3±12,8	5,28	43,7±11,7	5,25	43,8±12,4	6,25
Total protein	71,5±2,1	2,33	72,5±3,4	2,08	73,2±1,81	3,02	73,5±2,1	2,28
Erythrocytes	9,85± 8,4	1,51	10,57±10,3	2,42	10,81±11,2	2,93	11,27±11,4	1,84
Leukocytes	7,25±0,24	0,21	7,28± 0,84	0,89	7,47±0,59	0,54	7,85±0,984	0,29
Hemoglobin	11,5±3,12	2,21	11,84±2,56	3,40	12,8±2,87	2,07	12,4±3,54	3,02
Control group								
AcAT	40,8±10,7	3,51	41,7±11,7	6,87	41,5±10,6	4,52	41,3±12,2	5,52
Total protein	65,2±3,2	1,28	66,8±2,5	1,29	68,5±3,1	2,20	68,9±3,3	3,82
Erythrocytes	8,54±7,8	0,98	8,59±5,4	1,48	8,85±4,5	3,39	8,98±3,7	1,48
Leukocytes	7,53±1,4	0,36	7,81±0,58	0,37	7,87±0,89	0,45	7,69±1,87	0,29
Hemoglobin	9,89±2,87	3,84	10,8±2,69	2,48	10,2±1,98	2,65	10,7±2,08	3,47

Note: Experimental group significance: **P<0,01**

When analyzing the relationship between biologically active substances in blood serum such as aspartate aminotransferase (AST), total protein, erythrocytes, leukocytes, and hemoglobin and meat productivity, it was determined that in the experimental group receiving supplementary feeding, clear correlations were observed between these indicators and meat productivity. From the age of 2 months up to the slaughter age of 8 months, analysis of blood serum composition showed that the levels of aspartate aminotransferase (AST) gradually increased with age. Moreover, these enzyme levels were found to be higher in the experimental group compared to the control group. Starting from 2.5 months of age, AST levels in the experimental group were on average 2.0 units higher. In terms of total protein content, the experimental group demonstrated higher values, reaching levels of 6.3–6.7. This indicates that in animals of the experimental group, metabolic activity mediated by enzymes was more

intensive. Similarly, with respect to total protein levels, animals receiving supplementary feeding consistently showed higher indicators across all age periods.

Conclusion. It was established through the experiments that animals with higher total protein levels in the organism exhibited higher growth rates and fattening intensity. No significant changes were observed in the formed elements of blood, namely erythrocytes, leukocytes, and hemoglobin levels. However, in experimental animals where higher variability in blood formed elements was recorded, meat productivity indicators and economic efficiency were also found to be higher.

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