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FEEDING OF DOMESTIC THIN-TAILED SHEEP USING FEED ADDITIVES

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Annotation. Insufficient feeding slows down the development of animals, the growth of muscle tissue, sharply reduces fat deposition, while increasing the yield of edible tissues and less valuable cuts. Under intensive feeding, development is accelerated and meat precocity increases, and at a young age, animals have such a ratio of tissues that it is possible to obtain a significantly higher yield of better quality meat can be obtained. Improved nutrition sharply stimulates muscle growth. The role of improved feeding is especially influential in the first year of an animal's life, since the muscles develop most intensively during this period. High-quality feeding is the most important factor determining the quality of products obtained from animals. The presence of a good supply of feed is the main condition for the development of animal husbandry. For the proper rearing of animals, obtaining a large volume of products and increasing the livestock, it is necessary to have a feed base that provides animals with nutrients. Inclusion of the feed additive felutsen in the fattening diet of fine-wool sheep rams in the conditions of the Ibyraim kazhy peasant farm in the Kazygurt district of the Turkestan region increased the live weight gain of the animals. During the fattening period, they gained 1.94 kg or 5.3% more weight than their peers from the control group, with low feed costs per 1 kg of weight gain.

Keywords: fattening, sheep breeding, ram, live weight, weight gain, slaughter yield, feed costs.

Introduction. Creating optimal feeding and housing conditions during the rearing, fattening and feeding of animals ensures the most economical use of feed and labour and high production efficiency. At the same time, it is advisable to make maximum use of local and high-protein feed [1]. The increase in live weight of lambs occurs mainly due to intensive muscle growth, therefore, when fattening them, it is necessary to use feed with a higher content of digestible protein [2].

According to Sh. N. Zarpullaev, G. Maykhanova [3], during the 75-day fattening period, the increase in carcass weight of lambs was mainly due to the most valuable muscles in terms of nutrition (4.78 kg) and fat deposits (1.79 kg) and, to a lesser extent, due to the less valuable bones of the carcass skeleton (1.09 kg), therefore, the quality of lamb meat improved significantly.

The protein requirement of lambs and young animals during intensive meat production is high, and it is not always possible to compensate for its deficiency in the diet with traditional feeds. In these conditions, feed additives play a certain role in solving the problem of feed protein deficiency [4].

Authors studying feed additives [5] found that protein supplements (sunflower meal) increased the live weight of sheep by 13.7-16.7% and reduced feed costs. Some scientists confirm that an imbalance in animal diets for protein components is the main factor hindering productivity growth [6]. At the same time, ruminants are characterized by relatively low efficiency in utilizing dietary protein, especially diets high in nitrogen. However, this efficiency increases dramatically when animals are fed low-nitrogen diets.

Numerous studies have established that ruminants have a unique ability to absorb large amounts of nitrogen from amide compounds and ammonium salts with the help of symbiotic microflora. A variety of factors, including physical, chemical, dietary, biological, and endogenous

ones, have been shown to influence microbial protein synthesis in the rumen [7]. However, at high and even medium levels of productivity, protein synthesis by rumen microorganisms is far from sufficient to meet the animals' amino acid requirements. On the other hand, simply increasing the natural protein content of feed leads to excessive breakdown in the rumen and ultimately to irrational use [8].

Analyzing global experience in sheep breeding, it can be concluded that high competitiveness and economic efficiency in the industry can be achieved primarily by increasing meat productivity. In the current situation, it seems relevant to use various supplements to increase the meat productivity of domestic fine-wool breeds [9, 10].

Following summer fattening on summer pastures, low-weight lambs and weaning lambs were intensively fattened. Before fattening, the control and experimental groups of rams were dewormed. The control and experimental groups were fed ad libitum, with nutritional and energy values determined by calculation using the tabular data [11] and direct laboratory analysis.

The reference manual "Norms and Rations for Farm Animals" [12] established feeding standards for fattening lambs and young ewes. The feed mixtures were enriched with high-protein concentrates, and local and alternative feeds were used as much as possible. Before placing the animals on fattening and finishing, as well as during and after fattening, to study the dynamics of meat productivity, test slaughter of 3-5 rams from each group was performed according to the standard methodology [13]. During test slaughter, pre-slaughter live weight, fatness, carcass weight and yield, visceral fat, category I and II offal, hide, blood and muscle, fat deposits, and carcass bones were recorded. Product evaluation was performed visually based on the shape and development of muscles, the presence of fat deposits, and the nature of their distribution.

Carcass morphology, weight, yield, and the ratio of meat, muscle, deposited fat, and bone were determined at placement and after removal from fattening and finishing.

The rate of meat growth, fat deposits, and bone deposits was determined based on the results of preparation and weighing. The amount and nature of fat deposited in the bodies of lambs and young sheep were determined based on the results of weighing it during control slaughter, carcass preparation, and determination of the chemical composition of the carcass pulp.

Meat quality was determined based on the ratio of muscle, fat, and bone content, as well as the chemical composition of the carcass flesh. Chemical analysis of the carcass flesh determined the water, protein, fat, and ash content of the samples. The caloric content of meat was determined based on the chemical composition and calculated pulp content. The economic efficiency of preparing lambs and young sheep for meat was determined based on the costs incurred and the proceeds from animal sales, as well as the profit margin and profitability.

Research into the use of feed additives in feeding young sheep of domestic fine-wool breeds is of significant scientific and practical importance, as the effectiveness of sheep farming is largely determined by the complete and balanced nutrition of young animals. Given increasing demands for wool and meat quality, as well as the limited availability of traditional feed, the search for biologically active additives capable of enhancing nutrient digestibility, intensifying growth, strengthening immunity, and improving feed conversion is particularly important. For domestic fine-wool breeds adapted to local climate and feeding conditions, the use of appropriately selected additives not only increases productivity and maintains breed characteristics, but also reduces production costs. Therefore, research into the effectiveness of various feed additives in young sheep diets is an important area for enhancing the competitiveness of domestic sheep farming and the sustainable development of the livestock industry.

Materials and research methods. The aim of our research was to study the prospects of using protein-mineral supplements in the diets of fattened rams. To achieve this goal, the following tasks were set:

- to study the growth and development of young animals with different fattening diets;
- to evaluate the fattening and meat qualities of the experimental young animals;
- to determine the level of economic efficiency of fattening rams of fine-wool breeds using

feed additives.

The material of the research was the rams of the fine-wool breed of sheep of the peasant farm "Ibyraim kazhy" of the Turkestan region. During the work, general zootechnical research methods were used to determine the increase in live weight, feed costs per unit of production, and control slaughter of animals [14]. The experimental data were processed in the Microsoft Excel program using biometric and mathematical methods of analysis. After fattening, the rams were put on intensive fattening according to the developed research scheme (Figure 1).

Effective technologies for preparing lambs and young fine-wool (South Kazakhstan Merino) sheep for meat in the conditions of southern Kazakhstan	
↓	↓
Technology of intensive fattening and finishing of rams	Meat productivity of rams
↓	↓
1. Intensive fattening of lambs on natural pastures, grain crop residues, and alfalfa afterglow with supplemental feeding. 2. Fattening and finishing of lambs. 3. Fattening of lambs using local and alternative feeds. 4. Autumn fattening of young lambs on natural pastures, grain crop residues, and alfalfa afterglow with supplemental feeding. 5. Intensive fattening of young lambs using local, high-protein, and alternative feeds.	1. Changes in slaughter quality of lambs during fattening. 2. Lamb quality. 3. Live weight, carcass weight and yield, visceral fat, meat products, tissue, and lamb quality during fattening. 4. Development of meat productivity in young animals during the spring-summer fattening period. 5. Growth, meat development, and changes in lamb quality during intensive fattening.
↓	↓
Economic efficiency of selling rams for meat	

Figure 1 – Developed research plan

The manifestation of hereditary productivity of animals depends primarily on feeding and maintenance. They are the most important environmental factors that have a significant impact on the growth and development of animals, the level of productivity and the quality of products [15, 16]. To assess the feed payment by live weight gain, we put thirty rams on control fattening, fifteen in each group. The age of fattening was 4 months; the age of removal was six months. All animals had a level of live weight close to the average. Based on the traditionally used feeds on the farm, a farm ration for fattening fine-wool rams on the farm was compiled, consisting of alfalfa hay, barley bran, and wheat bran (Figure 2).

Figure 2 – Fine-wool rams during fattening

The basic diet of fattening rams corresponded to the body's requirements and consisted of the following types of feed: alfalfa hay - 1.0 kg, barley meal - 0.35 kg, wheat meal - 0.2 kg. The diet contained 1.3 EFU and 154.2 g of digestible protein. To balance the diet in terms of vitamin-mineral and sugar-protein ratio, the experimental group of rams additionally included the feed additive felutsen in the diet. The feed additive felutsen contains easily fermented carbohydrates (sugars), vegetable protein, vegetable fat, and highly purified salt (sodium chloride). Macronutrients: calcium, phosphorus, magnesium, sulfur. Micronutrients: manganese, copper, zinc, cobalt, iodine, selenium. Vitamins: A, D3, E. Metabolic energy: 2.9 MJ/kg.

Table 1 – Diet for fattening rams

Indicator	Unit of measurement	Quantity
Alfalfa hay	kg	1.0
Barley husk	kg	0.35
Wheat husk	kg	0.20
The diet contains:		
EFU (energy feed unit)	-	1.3
dry matter	kg	1.31
crude protein	g	206.6
digestible protein	g	154.2
calcium	g	14.0
phosphorus	g	3.97
carotene	mg	423.7

The experimental young animals were kept in the same base, but in different pens. Every day, each group of rams was given a certain amount of feed in the morning, between 7 and 8 o'clock, they were given ½ of the daily norm of alfalfa hay, then, between 12 and 13 o'clock, they were given barley bran, and between 13 and 14 o'clock - wheat bran, and between 17 and 18 o'clock they were given the second half of the bulk feed. The animals of the experimental group were additionally given the feed additive felutsen in their diet. To account for palatability, the uneaten remainder from the previous feeding was weighed before each feeding. Based on the daily accounting of the given and uneaten feed, it was established that the rams from the control group ate less feed than the animals of the experimental group.

We also calculated the feed costs for production. Analysis of the obtained data, allowing us to judge the live weight gain over the entire fattening period, showed that the live weight at the beginning of fattening was higher in the experimental group of rams. This fact reflected the real difference between the average values of this feature in the experimental group of rams. However, during the fattening period, they gained 1.94 kg or 5.3% more weight than their peers from the control group. The experimental rams had the lowest feed costs for gaining 1 kg of live weight, at 7.31 EFU, which is 2.8% less than in the control group.

Table 2 – Feed costs for live weight gain

Indicator		Group	
		control	experimental
Live weight, kg	initial	27.53±0.24	29.13±0.39
	final	36.38±0.32	38.32±0.43
Absolute gain in live weight, kg		8.85±0.09	9.19±0.11
Total costs for the experimental period per 1 head, ECU		66.16	67.16
Consumed ECU per 1 kg of live weight gain		7.48	7.31
Total costs of digestible protein per 1 head, g		7574.1	7706.88
Consumed digestible protein per 1 kg of live weight gain		855.83	838.62

In order to study and evaluate the slaughter qualities of the experimental young animals, in our experiment, a control slaughter of rams was carried out. For this purpose, 3 heads of young animals were selected from each group, which had live weight indicators close to the average for their groups (Table 3).

Table 3 – Slaughter qualities of rams at the age of 6 months, kg

Indicator	Group	
	I	II
Pre-slaughter live weight	36.48±0.24	38.43±0.27
Weight of fresh carcass	16.13±0.18	17.42±0.15
Weight of internal fat	0.147±0.06	0.164±0.04
Slaughter weight	16.28±0.17	17.58±0.21
On average	44.6	45.8

The main criteria that give an idea of meat productivity are slaughter weight and slaughter yield, which are largely associated with the genotype of the animal [17]. The results obtained during the control slaughter indicate certain differences between the rams of the control and experimental groups (Figure 3).

Figure 3 – Carcasses of rams removed from fattening

In terms of pre-slaughter live weight, the young animals of the experimental group exceeded the indicators of their peers from the control group by 5.3%. The differences remained in the post-slaughter characteristics. The carcasses of the rams of the experimental group weighed 8.0% more than the carcasses of the control animals; the content of internal fat was 11.5% higher, with higher slaughter yield indicators for the rams of the experimental group of 45.8%, which is 2.7% more than in the control group.

Lamb quality. According to scientists, quality feeding determines the quality of the final product obtained from animals [18]. During the 60-day fattening process, the increase in carcass weight occurs mainly due to the more valuable skeletal muscles and fat (2.325-2.64 kg) and to a lesser extent due to the increase in skeletal bones (0.56-0.57 kg). In this regard, the meat coefficient and muscle-bone ratio increase sharply from 2.98 and 2.67 to 3.98-4.08 and 2.97-3.10 units (Table 4).

Table 4 – Morphological composition of lamb carcasses

Indicators	Units	After removal from fattening	
		control	experimental
1	**2**	**3**	**4**
Carcass	kg	16.13±0.18	17.42±0.15
	%	100.0	100.0

1	2	3	4
Pulp	kg	12.69±0.35	13.78±0.36
	%	78.7	79.1
Incl. muscles	kg	7.45±0.20	8.28±0.18
	%	58.7	60.1
Fat	kg	2.53±0.09	2.61±0.09
		20.0	19.0
Bones	kg	2.51±0.10	2.67±0.09
	%	19.8	19.4
Tendons	kg	0.19±0.08	0.20±0.08
	%	1.5	1.5
Coefficients: meatiness	units	3.98	4.08
muscle-bone	units	2.97	3.10
muscle-fat	units	2.94	3.16

During the fattening period, the water content in the pulp noticeably decreases from 70.4% to 55.8-56.7%, while the specific weight of fat, on the contrary, increases from 10.2% to 27.9-28.9%. Due to the increased accumulation of fat in the carcass, the caloric content of 1 kg of pulp increases sharply from 8.3 to 14.4-14.8 mJ (Table 5).

Table 5 – Chemical composition of lamb carcasses

Chemical composition of lamb carcasses	Units	After removal from fattening	
		control	control
Water	%	55.8	56.7
Fat	%	28.3	27.9
Protein	%	14.5	14.6
Ash	%	0.8	0.8
Caloric content	mJ	14.8	14.4

The compared groups of lambs did not have significant differences in the morphological composition of the carcass and the chemical composition of the pulp.

Conclusion. A calculation of the economic efficiency of using the feed additive Felutsen in fattening rams shows that the experimental group animals generated superior revenue compared to the control group, averaging 1,477 tenge per head. Based on studies on the economic efficiency of selling sheep for meat, it can be concluded that selling lambs in the year of birth improves the quality of mutton produced and reduces overhead and costs. At the same time, after rearing young animals and preparing them for meat, high economic efficiency can be achieved.

Thus, a literature review reveals that in countries with developed sheep farming, mutton is produced primarily by selling lambs for meat at 6-8 months of age. Effective methods for preparing the meat contingent of sheep for meat include fattening lambs and young animals using natural and artificial pastures, grain stubble, after growth of perennial grasses, additional feeding (concentrated feed or green mass of pasture grasses), and fattening sheep with complete feeds with the maximum use of high-protein, non-traditional feeds and feed additives.

Summarizing the obtained data, it can be concluded that the use of the feed additive Felutsen in fattening young rams improves the fattening quality of young animals, enhances their ability to convert feed into product, and increases revenue by 1,476 tenge per head.

In general, fattening sheep, especially lambs and young animals, is an important method for preparing meat for meat production, contributing to increased production of high-quality mutton. With intensive fattening of lambs and young sheep, carcass weight gain occurs due to muscle growth. Therefore, increasing their protein intake by 25-30% contributes to a 13-17% increase in live weight. For lambs over 40 kg, fattening becomes more expensive, as lamb meat contains more

fat than protein. The more intensive the fattening and the higher the average daily weight gain of lambs and young animals, the fewer feed units are consumed per live weight gain. In scientifically-based fattening of lambs and young sheep, the use of high-protein feed is promising. During fattening, the average daily live weight gain of lambs and young sheep, depending on the nutritional value of the feed, breed, age, live weight, fattening intensity, and other factors, reaches 120-250 grams, carcass weight 16.3-17.42 kg, carcass yield 45.5-47.5%, and muscle-to-bone ratio up to 3.10 units.

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ОТАНДЫҚ БИЯЗЫ ЖҮНДІ ТҰҚЫМДЫ ЕРКЕК ТОҚТЫЛАРДЫ ҚОСЫМША ЖЕМШӨПТІК ҚОСЫНДЫСЫН ПАЙДАЛАНА ОТЫРЫП АЗЫҚТАНДЫРУ

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Аңдатпа. Азықтандырудың жеткіліксіздігі жануарлардың дамуын, бұлшықеттінің өсуін баяулатады, ағзадағы майдың жиналуын күрт төмендетеді, ал жеуге жарамды ұлпалар мен құнды емес бөлшектерің шығымы артады, ал қарқынды азықтандыру кезінде дамуы жеделдейді және ет ерте жетілуі артады, ал жас кезінде жануарларда ұлпаларының сондай арақатынасы болады, онда сапалы ет өнімдері едәуір көп шығуы мүмкін. Сапалы азықтандыру бұлшықеттің өсуін күрт арттырады. Толыққанды азықтандырудың рөлі әсіресе жануардың өмірінің бірінші жылында әсер етеді, өйткені бұлшықет осы кезеңде ең қарқынды дамиды.Сапалы азықтандыру – жануарлардан алынатын өнімнің сапасын анықтайтын ең маңызды фактор. Жақсы жем-шөп қорының болуы мал шаруашылығын дамытудың басты шарты болып табылады. Жануарларды дұрыс өсіру, өнімнің үлкен көлемін алу және малды көбейту үшін жануарларды қоректік заттармен қамтамасыз ететін жем-шөп қоры болуы керек.Түркістан облысы Қазығұрт ауданы "Ибырайым қажы" шаруа қожалығы жағдайында биязы жүнді қойларды бордақылау рационына қосымша Фелуцен қоспасын қосу жануарлардың тірі салмағының өсуін арттырды. Бордақылау кезеңінде олардың салмағы 1,94 кг-ға немесе бақылау тобындағы тетелестеріне қарағанда 5,3% - ға көп салмақ берді, 1 кг қосымша салмаққа жұмсалған жем-шөптің шығыны аз болды.

Тірек сөздер: бордақылау, қой шаруашылығы, қой еті, тірі салмағы, тірі салмағының өсуі, сою салмағының шығымы, жем-шөп шығындары.

КОРМЛЕНИЕ БАРАНЧИКОВ ОТЕЧЕСТВЕННЫХ ТОНКОРУННЫХ ПОРОДЫ С ИСПОЛЬЗОВАНИЕМ КОРМОВОЙ ДОВАБКИ

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Аннотация. Недостаточное кормление замедляет развитие животных, рост мускульной ткани, резко снижает отложение жира в организме, при этом повышается выход съедобных тканей и менее ценных отрубов, а при интенсивном кормлении ускоряется развитие и повышается мясная скороспелость и в молодом возрасте у животных бывает такое соотношение тканей, при котором представляется возможность получать значительно большой выход мяса лучшего качества. Улучшенное питание резко стимулирует рост мускулатуры. Роль улучшенного кормления особенно влияет в первый год жизни животного, поскольку мускулатура наиболее интенсивно развивается в этот период. Качественное кормление – самый важный фактор, определяющий качество продукции, получаемой от животных. Наличие хорошего запаса кормов является главным условием развития животноводства. Для правильного выращивания животных, получения большого объёма продукции и увеличения поголовья необходимо наличие кормовой базы, обеспечивающей животных питательными веществами. Включение в рацион откорма баранчиков овец тонкорунной породы в условиях крестьянского хозяйства «Ибырайым кажы» Казыгуртского района Туркестанской области кормовой добавки фелуцен увеличило прирост живой массы животных. За период откорма они набрали вес на 1,94 кг или 5,3% больше, чем сверстники из контрольной группы, при низких затратах корма на 1 кг прироста живой массы.

Ключевые слова: откорм, овцеводство, баранчики, живая масса, прирост массы, убойный выход, затраты корма