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Original Research Article

The Effect of Additional Feeding On the Processes of Digestion and Natural Resistance of the Sheep Body in Pasture Conditions

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ABSTRACT:
The article presents the materials obtained in the study of the effect of additional fertilizing on the digestive processes and the natural resistance of the body of Karakul sheep with year-round pasture content. We found that sheep and goats that grazed on the pasture for a quarter of a year, regardless of their physiological state, are on half-starved rations, especially in the second half of suyagnost and at the beginning of the spring period. During these periods, the sheep of both groups compared in the winter period daily received from 0.70 to 0.78 energy feed units and from 20 to 28 g of digested protein, and at the beginning of the lactation period, these indicators were 86% of the norm, i.e., they received from 13 to 17% of nutrients. In this regard, we conducted experiments to study the effect of a household diet consisting of coarse feed: 130 g of mixed feed, 50-50% of barley and straw cutting and pasture feed. The sheep of the experimental group received an almost balanced diet for all nutrients. According to the data obtained, the composition and nutritional value of the diet consumed by sheep of the experimental group of feed practically meets their need completely, and in animals of the control group-only 82-85% of the nutritional needs. The highest concentration of total nitrogen was in the rumen of the experimental group – 123.33 mg%, while in the Queens of the control group, its concentration averaged 110.0 mg % or was 12.1% less. In the control group of Queens with a higher consumption of pasture feed, the digestibility of the main nutrients was lower compared to the animals of the experimental group. Inadequate feeding negatively affects the severity of the level of natural resistance.

Keywords: Feeding, Karakul Sheep, Productivity, Economic and Normalized Feeding, Suyagnost, Nutrients, Digestibility, Scar Fluid, Total, Protein and Non-Protein Nitrogen, Natural Resistance, Bacterial and Lysozyme Activity

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INTRODUCTION

The increase in mutton production, obtaining high-grade Karakul sasek, improving quality and reducing costs has been and remains one of the priorities of the agricultural sector. In solving this problem in the modern market economy, it is very important to develop methods for increasing the production of sheep products, taking into account zonal-natural, economic and economic conditions.

Among the most important methods to increase production and improve the quality of sheep products, the most significant role is assigned to the organization of full-fledged, balanced feeding of sheep during the period of suyagnosti. This period coincides with the winter season, when pastures with feed components are not able to meet the needs of the body of Queens with the necessary nutrients. As a result, the uterus is lost in live weight, in most cases small and poorly viable young are born. An increase in the viability and productivity of Karakul sheep is possible with the implementation of a set of measures, which includes, first of all, the organization of full-fledged feeding and a stable feed base, without which it is impossible to work on improving the breeding and productive qualities of these animals. The presence of extensive natural lands in Uzbekistan at one time served as the basis for the year-round maintenance of all types of small cattle on pastures. In addition to economy, pasture maintenance in winter contributed to the physical training of the animals ' body and the formation of a very valuable quality - their adaptability to harsh natural and climatic conditions, their body's resistance to various diseases and other unfavorable factors of nature (Makartsev, 2012; Mahdiev, Moroz, Belik & Efimova, 2011; Taubaev, 2011).

With the intensification of agriculture, accompanied by an increase in arable land due to the reduction of pastures – the main feed base of sheep and goats, sheep farming has lost its advantage over other branches of animal husbandry, i.e. this system should be improved. The body's protective factors, especially non-specific ones, can be expressed with varying strength depending on many reasons. For example, the severity of the level of natural resistance decreases sharply with under-feeding of animals, crowded content, overwork, overheating and hypothermia of the body (Belik, 2011). Therefore, it is very important to increase the resistance of the animal body, along with full-fledged feeding and compliance with sanitary and hygienic requirements for animal reproduction, to select individuals with high indicators of natural resistance. Improvement of these traits by intrabreed selection, with year-round pasture content, did not give positive results (Aboneyev, Konik & Shutova, 2015; Karamaev, 2012). In order to fully use the biological reserve of the body in increasing meat productivity, to preserve the developing offspring and to obtain resilient young animals with qualitative characteristics, it is necessary to provide suyagny Queens with a sufficient level of nutrition in winter. In addition, poor nutrition of Queens, especially after the 90th day of pregnancy, led to a delay in fetal growth during the embryonic period and, as a rule, to a decrease in the productivity of sheep.

The aim of the study was to study the effect of economic and normalized feeding on the processes of digestion, digestibility of nutrients and natural resistance of the body of experimental sheep.

To achieve the goal of the study, the following tasks were set:

- study the amount of nutrients consumed by animals in two groups of sheep compared;
- determine the change in the composition and properties of the contents of the rumen and the digestibility of nutrients in connection with feeding different diets;
- to investigate and establish the effect of different levels of nutrients on the degree of natural resistance of the body of the compared groups.

MATERIALS AND METHODS

To study the effect of different levels of feeding on scar metabolism and other metabolic parameters in Karakul Queens from October to March, balance and physiological experiments were conducted with the compared diets. The experiment

was started in October, before insemination, and completed in the spring-shearing, i.e. captured the entire production cycle with the production of products, which made it possible to determine the economic efficiency of the system of keeping and feeding Karakul sheep. Exchange experiments using chromium oxide and fecal sacks were performed on 3 sheep in each group. During the day they were together with the flock, and at night they were placed in separate cages and, according to the appropriate scheme of experience, were provided with additional feed. In the morning, before driving to pasture, the animals were given pills with chromium oxide (2 times in the morning and in the evening for 2.5 g), and bags were removed to determine the amount of collected feces. Individually, with an accuracy of ±5 g, the collected feces and feed residues in feeders were weighed. Along with the exchange experience, physiological experiments were conducted to study the processes of digestion in the rumen, the exchange of substances between the digestive tract and blood.

RESULTS AND DISCUSSION

The amount of nutrients consumed in the mother hoofed group was higher: energy feed unit - by 17.2%, metabolic energy-by 17.8%, digested protein-by 36.2% and organic matter - by 9.6%, and the amount of fiber consumed was less by 13.8%.

Table 1: The amount of feed and nutrients actually consumed by the experimental animals

The Performance	Of The Group		In % to Control
	Control	Experimental	
Consumed dry matter of the diet, kg	0.830	0.910	+9.6
including pasture grass	0.410	0.175	-42.7
Additional top dressing:			
hay, kg	0.290	0.527	+81.7
concentrated feed, kg	0.130	0.217	+66.9
They contain:			
energy feed units	0.64	0.75	+17.2
metabolizable energy, MJ	6.7	7.9	+17.8
crude protein, g	103.4	127.4	+23.2
digestible protein, g	44.7	60.9	+36.2
crude fat, g	22.2	25.6	+15.3
crude fiber, g	243.4	209.9	-13.8
Nitrogen-free extractive substances (NFES), g	370.5	418.7	+13.0
organic matter, g	730.4	778.9	+6.6
calcium, g	12.8	14.8	+15.6
phosphorus, g	2.6	3.3	+26.9
sulphur, g	1.9	2.0	+5.3
carotene, mg	24	28	+16.7

Table 2: Indicators of cicatricial digestion (M ± m; n=3)

The Performance	Of The Group		In % to Control
	Control	Experimental	
Total nitrogen, mg%	109.11 ± 1.3	129.33 ± 2.0	18.5
Protein nitrogen, mg%	73.12 ± 1.7	98.19 ± 1.1	34.3
Non-protein nitrogen, mg%	35.98 ± 3.0	31.14 ± 3.3	-13.5
Ammonia, mg%	9.18 ± 0.9	14.46 ± 0.6	57.5
Volatile fatty acids, g/equiv/l	8.34 ± 0.3	12.11 ± 0.6	45.2
Acetic acid, %	64.71 ± 0.9	65.93 ± 0.8	1.9
Propionic acid, %	29.13 ± 1.2	28.91 ± 0.3	-0.8
Butyric acid, %	6.16 ± 1.7	5.66 ± 0.7	-8.2

In the table 1 data show that the composition and nutritional value consumed by the ewes of the experimental group feed almost ensures the need for them completely, and in the control group – only 82-85% nutritional needs. This also affects the digestive processes in the rumen.

The highest concentration of total nitrogen was in the rumen of the experimental group (129.33 ± 2.0 mg%), while in the control group it was less by 18.5% (109.11 mg%). Similar data were obtained when studying changes in the concentration of protein nitrogen in the content of the rumen. As is known, the content and ratio of non-protein and protein nitrogen in the rumen fluid under normal feeding conditions characterizes the degree of activity of microbiological processes associated with protein cleavage and synthesis. The concentration of non-protein nitrogen in the rumen fluid in the Queens of the control group was 35.98 ± 3.0 mg% or, significantly, was higher than in the Queens of the experimental group by 13.5%, and the concentration of ammonia in the rumen in the experimental sheep, on the contrary, was higher than in the control group by 57.5%. The minimum concentration of ammonia in the rumen content in control animals, in our opinion, is probably due to the fact that as the grasses dry out on autumn pastures, the cellulose-lignin complex increases in the diet, nutrients are lost, the worst conditions for the development of microorganisms in the rumen are created, and all this affects the concentration of ammonia in the rumen content (Kostomakhin, 2008; Novopashina, Sannikov & Kizilova, 2015; Toshchev, 2008). The increase in the concentration of ammonia in the rumen in animals of the experimental group compared to ewes in the control group can be explained by the fact that when a sufficient level of nutrition ewes of the experimental group received more concentrates with soluble proteins, which probably contributed to the formation of rumen ammonia. The concentration of LFA in the scar content was highest in the Queens of the experimental group – 12.11 ± 0.6 g / EQ/l or by 45.2% higher than in the Queens of the control group. The marked differences in the level of LFA concentration are obviously due, first, to the effect of additional top dressing on the processes of microbial fermentation of feed nutrients. Indicators of exchange experience made it possible to calculate the coefficients of digestibility of nutrients by goats (table 3).

Table 3: Nutrient digestibility coefficients of diets, %

Name of nutrients	Groups		In % to Control
	Control	Experimental	
Dry matter	52.92	55.57	5.0
Organic matter	56.21	58.96	4.9
Protein	43.21	46.13	6.8
Fat	45.41	66.51	46.5
Fiber	60.90	63.09	3.6
Of NFE - nitrogen-free extractive substances	53.83	65.71	22.1

From the data in table 3, it can be seen that in the control group of sheep with a higher consumption of pasture feed, the digestibility of basic nutrients was lower, compared to the animals of the experimental group, in which the digestibility of basic nutrients was higher than in animals receiving a household diet. In the sheep of the control group, the digestibility of dry matter compared to the uterus of the experimental group was lower by 5.0%, organic matter - by 4.9%, protein - by 6.8%, fat – 46.5%, fiber and BEV - by 3.6% and 22.1%, respectively. One of the most important environmental factors affecting the animal body, including its defense mechanisms, is feeding. At the same time, the type and level of feeding, the ratio of individual feeds in the diet, and the balance of the diet for various nutrients are of particular importance (Vinnikov, Sultanov, 2008;

Kalashnikov, Kleymenov & Shcheglov, 1985). According to available data, adult sheep after the pasture season, i.e. by the insemination period, have higher rates of natural resistance, since pasture plants contain all the necessary nutrients in their composition. In the spring and winter period, due to the drying of pasture grasses, the chemical composition and biological usefulness of the feed consumed changes dramatically. As mentioned above, to fill in the missing part of the winter diet, sheep were fed rations corresponding to the norms of feeding Queens in the last months of pregnancy and studied the effect of the level of feeding on the natural resistance of the animal body.

Table 4: Indicators of natural resistance of sheep [M ± m, n=15]

Indicators	Groups	
	Control	Experienced
Morphological and biochemical composition of blood		
Albumins, %	34.75 ± 1.35	36.90 ± 1.88
α-globulins,%	13.08 ± 1.38	11.10 ± 0.96
β-globulins,%	19.96 ± 2.67	19.68 ± 1.09
γ-globulins,%	41.21 ± 2.83	42.33 ± 1.91*
Hemoglobin, g / l	100.8 ± 6.15	106.67 ± 5.33
Red blood cells, million / µl	5.89 ± 0.13**	5.17 ± 0.16
Humoral factors		
Lysozyme activity, %	52.00 ± 1.65	56.17 ± 1.07
Bactericidal activity, %	30.78 ± 0.38	31.80 ± 0.99
Total protein: dry matter protein	9.53 ± 0.17 6.41 ± 0.14	11.6 ± 0.21 8.29 ± 0.24
Cellular factors of non-specific protection		
White blood cells, thousand/µl	6.80 ± 0.23	8.24 ± 0.34
Phagocytic activity, %	70.87 ± 1.30	69.1 ± 0.49
Lymphocytes, %	51.67 ± 1.45	50.33 ± 0.29

The concentration of albumins in the blood serum reflects the dynamics of the processes of protein synthesis and renewal occurring in the body, and the higher their level,the more active it is. It was found that the albumin content varied from 34.75 % (control group) to 36.90 % (experimental group). The combined effect of lysozyme reflects the degree of manifestation of the protective properties of the animal body, which is well transmitted by the bactericidal activity of blood serum. The most important factor in protecting the body from infections is lysozyme. According to the table, the highest value of lysozyme activity of blood serum was in the experimental group of Queens-56.17%, which is 8.0% higher than in the control group. In addition, the greatest bactericidal activity was also distinguished by the blood of experimental animals, the indicator of which in comparison with the uterus of the control groups was lower by 3.3%. blood Proteins take an active part in the protein metabolism of the entire body and are functionally considered as a plastic material for the formation of specific proteins of various tissues. The results of the conducted studies revealed a pattern that with an increase in the number of feed proteins received in the body of sheep, the amount of dry matter of total protein increased by 21.7% and the percentage of protein - by 29.3%. From the analysis of the obtained data, it can be seen that the number of white blood cells in the blood of sheep that received different amounts of nutrients had significant fluctuations. At the same time, in the sheep of the experimental group, this indicator was 21.2% higher than in the control group.

CONCLUSIONS

Thus, it can be stated that the sheep of the experimental group, when they were provided with nutrients, had significant

differences in the digestibility of nutrients and indicators of natural resistance compared to their peers in the control group. In the control group, with a decrease in the level of nutrition, the digestibility of nutrients and natural resistance factors also decreased.

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