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Studying Meat Productivity And Morphological Indicators Of Sheep By Biophysical Methods.

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ABSTRACT

Currently, the sheep industry focuses on increasing meat production and improving the quality of products. To solve this problem, it is important to develop and apply effective methods and methods to increase and improve meat production. The use of biophysical methods capable of exerting a stimulating effect on the growth of the animal organism acquires a certain interest in animal husbandry. One of such methods is infrared low-intensity laser radiation. Laser technologies used in animal husbandry in the early period of ontogeny to realize the genetic potential of productive qualities are the most effective. The article presents the results of research aimed at studying the effect of infrared low-intensity laser radiation on the organism of young sheep and their productive indices. The region of action of laser radiation on the animal organism is determined. A positive effect of low-intensity laser radiation has been established, which has a stimulating effect on the growth of the organism of sheep, obtained from the breeding of semi-sacred rams and genotypes (poll dorset x North Caucasian meat and wool).

Keywords: meat production, low-intensity laser radiation, sheep

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INTRODUCTION

Sheep breeding is an important branch of the world's productive livestock. The full utilization of the biological capabilities of animals, including sheep, for the production of various types of sheep products, is of great importance. Currently, the sheep industry focuses on increasing meat production and improving the quality of products. Therefore, the problem of growing healthy, viable animals, increasing their productivity and obtaining high-quality environmentally friendly products becomes very topical [1, 2, 3, 4, 5].

The use of infrared low-intensity laser radiation acquires a certain interest in cattle breeding. It is known that laser technologies used in animal husbandry in the early period of ontogeny for the realization of genetically inherent productive qualities are the most effective. The effectiveness of the laser beam is manifested primarily in the multiple strengthening of the immune system, which has an effect on increasing the productivity of animals [6, 7, 8].

Therefore, a certain interest in the scientific plan is the development of a method for using infrared low-intensity laser radiation and determining its effect on the productivity of young sheep [9-15].

MATERIAL AND METHODS

Studies were carried out in the territory of the Stavropol Territory in the conditions of the 4th agro climatic zone (Tsimlyansky Experimental Station VNIIOK). To assess the meat productivity of animals, we studied the meat qualities and the degree of development of internal organs in young animals obtained from the breeding of half-blooded sheep and genotypes (poll dorset x North Caucasian meat and wool) at the age of 5 months. During lambing of the ewes, three groups of lambs (sheep) were formed: group I (n = 20) - control, without the use of laser radiation; Group II (n = 21) - lambs obtained from non-irradiated ewes, were treated twice (on days 15 and 20); Group III (n = 24) - lambs, obtained from irradiated ewes, were additionally treated twice (on days 15 and 20). In the experiment, clinically healthy animals were involved.

The irradiation was carried out with the aid of a laser apparatus, whose action is based on the use of low-intensity laser radiation (pulsed) near infrared.

In lambs, exposure to laser radiation was carried out at a biologically active point located at the level of the first thoracic vertebra, responsible for the innervation of the thymus (the duration of exposure to the area was 1.5 minutes).

RESULTS AND DISCUSSION

The obtained data of meat qualities in the animals under study testify to the advantage of experimental groups of young animals over the control group of sheep. Thus, the animals of the experimental groups (II and III) exceeded the control group in terms of the live weight before slaughter by 3.0 and 4.4%. The largest value of the paired carcass was also characteristic of the carcasses of the experimental groups (II and III) of the young, which is 3.7 and 6.5% higher than the animals in the control group. The unequal ability to synthesize internal fat had an effect on the carcass size of the experimental groups (II and III), which ensured an increase in slaughter weight, in comparison with the animals in group I, by 4.0 and 7.3%. However, the largest slaughter mass was observed in the animals of the third experimental group. The revealed regularity was also reflected in the size of the slaughter yield characteristic of the carcasses of this group of animals, which exceeded the indices of groups I and II by 1.1 and 0.7%.

Table 1: Young sheep meat production by low-intensity laser radiation influence

Indicators	Group		
	I	II	III
Pre-slaughter live weight, kg	27,0±0,57	27,8±0,64	28,2±0,76
The weight of paired carcass, kg	10,7±0,30	11,1±0,44	11,4±0,60

The weight of internal fat, kg	0,110±0,02	0,130±0,01	0,150±0,02
Slaughter weight, kg	10,81±0,63	11,23±0,40	11,60±0,47
Slaughter yield,%	40,0	40,4	41,1
Flesh yield,%	67,9	69,1	70,2
Bone yield,%	32,1	30,9	29,8
Meat ratio	2,12	2,24	2,35

Analyzing the results of the carcasses cut from the animals studied, it was established that in the carcasses of young animals irradiated with low-intensity laser radiation (groups II and III) a higher yield of the pulp (85.5% and 86.0%) was noted. Thus, the experimental animals (groups II and III) exceed the control group of sheep by the first-grade weight by 0.6 and 1.1%. The youngest group III of the experimental group is characterized by the smallest weight of the second grade, indicating that the increase in the live weight of animals of this group increased due to the increase in meat - the pulp of the 1st grade.

The results of boning of half-carcasses from each group of animals studied made it possible to establish the best morphological composition in the youngsters of experimental groups. It was revealed that in the carcasses of groups II and III contained more pulp in relation to the number of bones than in the peer group I, by 1.2 and 2.3%.

One of the indicators of the qualitative characteristics of meat productivity of animals is the meat factor, which indicates the correlation of muscle and bone tissue in the carcass. Thus, the meat factor in the youngsters of the experimental groups (II and III) was 5.7 and 10.8% higher than the control group of sheep.

Acceptance of quantitative and qualitative indicators of meat productivity of the animals under study revealed that the yield of the most valuable varieties of meat and its fleshy component was for the experimental youngsters of Group III, which was favored by low-intensity laser radiation.

Since the quantitative and qualitative changes were detected in the animals under study that were in similar feeding and maintenance conditions, we believe that in young animals of the III experimental group, the process of conversion of feed nitrogenous substances, as well as their transformation into body proteins, occurred more intensively.

One of the sides of revealing the interior features of animals is the study of the development of their internal organs and individual tissues. Of particular interest is the consideration of morphological features in young sheep under the influence of low-intensity laser radiation.

Table 2: Morphological characteristics of internal organs of young sheep by low-intensity laser radiation influence

Indicators	Group		
	I	II	III
Weight of allocated blood, kg	1,2±0,07	1,3±0,08	1,3±0,11
Heart mass, g	138,0±7,23	150,0±5,76	146,0±6,65
Weight of lungs with trachea, g	368,0±7,22	378,3±7,27	388,0±16,41
Spleen weight, g	69,0±5,20	78,0±4,93	88,0±8,62
Liver weight, g	367,0±8,82	420,0±17,32	438,0±13,64
Kidney mass, g	81,0±5,21	88,0±4,41	93,0±6,01
Length of thick intestine, m	5,4±0,03	5,5±0,06	5,5±0,28
Length of the small intestine, m	18,0±0,64	19,0±0,06	20,2±0,60
Gastric weight (without contents), kg	1,1±0,05	1,1±0,06	1,2±0,05

One of the important interior features is the blood of animals as an indicator of life processes occurring in the body. It was found that by the volume of circulating blood, the animals of the experimental

groups (II and III) exceeded the control group of sheep by 8.3%. The constant circulation of blood in the body is provided by the work of the heart, the mass of which in experienced animals (II and III group) was 8.7; 5.8% higher than in the sheep of the control group. For animals of experimental groups, a better development of the lungs was characteristic, the mass of which exceeded the control group of sheep by 2.7-5.4%, which ensured the intensification of metabolic processes in their bodies. The weight of the liver testifies to its normal development in all animals studied, but its best development was noted in sheep of experimental groups.

It can be assumed that the most intensive excretory capacity of the kidneys was in the animals of the experimental groups (II and III) since the size of this organ exceeded the value of the sheep parameter of the control group by 8.6-14.8%.

Since the productivity of the digestive system of an animal largely depends on its productivity, it is of particular interest to consider the features of the development of the digestive system, namely, the degree of development of the stomach and intestines.

An analysis of the data obtained in the examination of the gastrointestinal tract in the animals examined showed no changes in the length of the thick intestine and in the mass of the stomach. However, experimental animals differed better in the development of the small intestine than in the control animals.

Summarizing the consideration of morphological features in the animals under study, we ascertain that the performed studies and analysis of the data obtained indicate a better degree of development of the internal organs and gastrointestinal tract of the experimental animals. The revealed regularity testifies to the intensity of the course of metabolic processes in their organism, which ultimately affected their meat production.

CONCLUSION

Thus, the obtained data allow to assume the positive effect of infrared low-intensity laser radiation on the organism of sheep, which has a stimulating effect on the growth of the animal organism.

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