

## Meat Yield and Nutritional Evaluation of Lambs Meat of Different Interbreed Types of Dejaresco Sheep Breed

S.Yu.Dolgoplova, T. S. Sadykulov, Sh.R.Adylkanova and A. M. Toktarbaeva

Faculty "Technology and Bioresources" The Department "Technology of production of livestock and fish products" Kazakh National Agrarian University.

<http://dx.doi.org/10.13005/bbra/2278>

(Received: 22 July 2016; accepted: 02 September 2016)

In this article we can see the results of researches on studying of meat productivity of four monthly lambs of different interbreed types of Dejaresco breed of sheep. The experimental part of this work was conducted in the new environmental conditions for Dejaresco breed of sheep of the foothill zone in "MADI" breeding farm of Zhambyl district of Almaty region. Animals produce two types of wool: white semifine (I interbreed type) and white semi-coarse, and fleece of a light gray color (II zonal - type). The aim of the research was the study of meat productivity of young animals of different types of interbreeding Dejaresco breed of sheep. It was found that rams of Dejaresco sheep breeds at the age of 4 months have relatively high indices of meat efficiency. The weight of steam carcass of rams of the I and the II interbreed types was 19.1 and 18.2 kg, the slaughter weight was 19.6 and 18.7 kg and carcass yield was 50.0 and 49.6%, respectively. The rams of the I interbreed type according to the main indicators of meat productivity have minor advantages over peers of the II type on carcass weight, pulp weight, slaughter weight on 2,6; 3,9; 5,7 and 4,8% ( $P < 0,90$ ), respectively. Were obtained the results of a study of the chemical composition and caloric content of rams meat. Were found the relatively low levels of cholesterol in the meat of rams of the I (1.56 mmol/l) and the II groups (1,67 mmol/l), that is slightly lower than in the comparative literature (2,36), and the content of cholesterol in the blood serum of the Dejaresco rams was 1.55 and 1.68 mmol/l, respectively. Overall, it should be noted that in the foothill zone of Southeast of Kazakhstan, i.e. in the breeding farm "MADI" there are quite favourable conditions for breeding of Dejaresco fat-tailed sheep. While in young Dejaresco sheep both with semifine and semi-coarse wool were obtained carcasses with high meat productivity indexes.

**Keywords:** Fat-tail sheep, meat productivity, interbreeding type, semifine and semi-coarse wool.

---

Currently, in the era of a rapid development of scientific and technical progress a problem of a food security of the population in the world is of the critical importance. The problem of providing the population with a complete food, which in the first place is the meat, is one of the important tasks of the agro-industrial complex in

each country. In this regard, the agricultural sector of our state should focus on the production of competitive products<sup>1</sup>.

Kazakhstan has huge areas of natural lands (222,3 million hectares), including natural pastures, which account for 84%, where 70% of them are located in arid and semiarid areas, where the most effective is the traditional breeding of sheep breeds of sheep<sup>2</sup>.

Fat-tail sheep are adapted to the specific conditions of the zone of their breeding. They have a high meat quality and precocity, besides, they are little energy-consuming, which is important in

---

\* To whom all correspondence should be addressed.

a market economy. A priority breeding of fat-tailed sheep is the production of young ram through the implementation of the lambs for meat immediately after weaning from their breeding queen<sup>3-9</sup>.

In this aspect, a certain interest among the populations of fat-tailed sheep in Kazakhstan has a Dejaresco fat-tailed breed of sheep, which was created in 1980. Sheep produce two types of wool: semifine (I type) and semi-coarse (II type) that has a great demand in the market. This is a unique achievement of scientists; sheep successfully combine homogeneous semifine wool with a rump (ASF). According to the level of productivity of wool they occupy the first place among the fat-tailed breeds of a sheep world. This type is based on a complex cross breeding - breeding "in itself" three-breed hybrids - Kazakh fat-tailed, Shropshire and Prekos.

The wool of these sheep, according to their technological properties meet the requirements of a crossbreeding type. Live weight of sheep is 90-110 kg, females - from 58 to 62 kg. Wool production from sheep - 4,5 - 6,0, breeding queen - 3,0 - 3,5 kg, wool length - 12-14 cm. Young animals at the age of 4.5 months have a live weight of 32-38kg<sup>10</sup>. It is a valuable gene pool with a large range of wool production (up to 12 kg), which had a great impact on the improvement of sheep breeds of sheep, bred in countries near and far abroad. Almost 30 years later, in 2009, was approved by order of the Ministry of agriculture - the second (zonal type of ASF), created by breeding "in itself" hybrids of the desired type from different generations with semi-coarse wool, produced by crossing of purebred Edilbaevsky breeding queen with Dejaresco - sheep of a meat-wool breed. The purpose of the creation of the second zonal type was in the extension of the zone of breeding of these sheep. They are more adapted to the unfavourable climatic conditions of individual regions of desert and semidesert zones of South-East and Central Kazakhstan, where at the present time they are bred in farms of 6 districts and of three regions of the Republic. Live weight of rams is 95-105 kg, wool yield is from 3.5 to 4.5 kg, in female sheeps - from 58 to 60 kg and from 2.8 to 3.0 kg, respectively. Animals of the new type according to the level of the shearings occupy one of the first places among the fat-tailed sheep with semi-

coarse wool. The young animals are quite precocious and at the age of 4.5 months their live weight is 33-39 kg. It should be noted that sheep of the both intrabreed types are bred on a year-round pasture. Feeding of hay and concentrated feed (0.5 kg per day) is received only by the main tugging ram in the occasional breeding period of the campaign, and in winter - a ram-candidate for a replacement of a tugging ram the next year (hay and 0.3 kg of a concentrated feed a day).

The first interbreed type of Dejaresco sheep belongs to the species of a wide range, as a valuable gene pool with a large range of wool production (up to 12 kg), which had a very positive impact on the improvement of sheep breeds of sheep, bred in countries near and far abroad. Sheep with semifine wool within a few decades in the breeding farm "Bukunussky" (now "Kungey") in Almaty region were exported to Uzbekistan, Turkmenistan, Tajikistan, Georgia and Mongolia. According to the multiplicity of use in the interbreed crossing and a habitat the Dejaresco sheep occupy the first place among the breeds of agricultural animals of Kazakhstan<sup>11</sup>.

Meat productivity is one of the main economically useful traits that determine the quality of the sheep. Therefore, the study of meat productivity, especially in fat-tailed sheep, is in the focus<sup>1</sup>. One of the objectives of breeders is to increase meat production and improve its quality, which is important for human health. One of such affordable and little energy-consuming technological elements in the production of mutton is the choice of the optimal period of development of high-quality lamb as the quality of this product is largely determined by the age of animals at slaughter.

## MATERIALS AND METHODS

The experimental part of this work was conducted in the new environmental conditions for Dejaresco breed of sheep in the foothill area of Almaty region on the breeding farm "MADI".

The purpose of our research was the study of meat productivity of young animals of different types of inbreeding Dejaresco breed of sheep.

To explore meat-fat qualities of the young sheep was carried out the slaughter of rams at the

age of 4 months (table 1). The animals were under normal production conditions and they were typical for each interbreed type of the flock. For the slaughter of animals were selected only 10 rams, that were typical for two interbreeding types of this herd, by 5 rams from each group.

## RESULTS AND DISCUSSION

According to the results of our research, it was found that at the age of 4 months of life rams of Dejaresco sheep of both interbreed types are characterized by the relatively high indices of meat efficiency. So, the carcass weight of steam rams of the I and the II interbreed types was 19.1 and 18.2 kg, the slaughter weight was of 19.6 and 18.7 kg, and the carcass yield was of 50.0 and 49.6%, respectively. Carcasses of lambs at this age are massive, wide and have the rounded shape, well-developed muscles, especially on the back, and a highly uniform distribution of subcutaneous fat. Especially because of these characteristics these animals compare favorably from the local coarse wool fat-tailed sheep. As you know one of the key and objective power indicators of animals

is the ratio of flesh and bone in their carcass - that is, the ratio of a power indicator. The value of this ratio is largely conditioned by the breed characteristics, age, fatness and animal sex. Even at the same weight of carcass the value can be different depending on the ratio of flesh and bones. According to our data, the lambs of both groups have a relatively high proportion of pulp in the carcass - 14.8 and 14.0 kg or 77.5 and 76.9%, respectively. The rams of the I interbreed type according to the main indicators of meat



**Fig. 1.** Carcasses of rams of the I and the II interbreed types of Dejaresco sheep breed in the age of 4 months

**Table 1.** Slaughter indicators of lambs of Dejaresco sheep breed

Figure	I (5)	II (5)
Pre-slaughter live weight, kg.	38,7±2,9	37,7±1,5
Carcass weight, kg.	19,1±0,6	18,2±0,8
The yield of the carcass, %	49,3	48,2
The mass of the fat tail, kg	2,0±0,2	2,0±0,6
The yield of the fat tail, %	5,2	5,3
Mass of internal fat, kg	0,5±0,1	0,5±0,1
The output of internal fat, %	1,29	1,32
The mass of the pulp, kg	14,8	14,0
The mass of the pulp, kg	77,5	76,9
Slaughter weight, kg	19,6±0,7	18,7±0,8
The output of slaughter weight, %	50,0	49,6
Bone mass, kg	3,8	3,8
The bone output, %	19,8	20,8
The coefficient of the meat content	3,8	3,7

**Table 2.** Chemical composition (%) and caloric value of meat

Group	Moisture	Protein	Fat	Ash	The caloric value of meat (kcal)
I	56,5	14,1	28,6	0,8	3230,9
II	57,9	15,3	25,8	0,9	3060,8

productivity have minor advantages over peers of the II type on carcass weight, pulp weight, slaughter weight on 2,6; 3,9; 5,7 and 4,8% (P d" 0,90), respectively. Slaughter yield was 50.0 and 49.6%, with the corresponding coefficients of power of 3.8 and 3.7, which admittedly, is a pretty good indicator. According to the results of studies by Sadykulov T. S. and Asylbekov K. G in the study of meat productivity of Dejaresco sheep breed, that were bred in breeding farm "Kungey" in desert sone, which is the homeland of these sheep, where there was the creation of this breed, it was found that in lambs of the I and the II interbreed types in the pre-slaughter live weight of rams of 38.8 and 37.6 kg, a carcass weight was 17.57 and 16.6 kg, and the output of the carcass was 45.19 and 44.1%, respectively. It should be noted that almost at the same pre-slaughter live weight of lambs that were bred in the breeding farm "MADI" comparing to the weight of the carcass they were superior to their peers from the breeding farm "Kungey" on 9.1 and 9.6%, respectively. Carcasses weight and slaughter weight of both groups of Dejaresco fat-tail sheep must be considered quite high. Comparative literature data show that Dejaresco rams are inferior in carcass weight and slaughter weight only to the largest fat-tailed sheep breeds of sheep world - Hissar and Edilbaevsky.

### CONCLUSIONS

Overall, it should be noted that in the foothill zone of Southeast of Kazakhstan, in a breeding farm "MADI" there are quite favourable conditions for breeding of Dejaresco fat-tailed sheep.

While in young Dejaresco sheep, both semifine and semi-coarse wool were obtained carcasses with high meat productivity indexes.

Indicators of slaughter weight, slaughter yield and morphological composition of carcasses provide mainly quantitative characteristics of meat quality of animals. In this regard, for the qualitative assessment, we determined the chemical composition and caloric content of meat - two types of animals.

As we know, the lamb meat according to the content of protein, essential acids, vitamins and minerals is not inferior to beef, and the fat

content and nutritional value is superior.

Chemical composition of meat makes this product very useful for the normal functioning of the whole organism: the most important benefit of meat – it consists mostly of protein, which is rather necessary for nutrition and building of cells in the body. Due to the high iron content in lamb's meet, it should be added to the daily meals of people diagnosed with anemia. This will allow quickly restoring the normal level of hemoglobin in the blood.

Besides the fact is that lamb's meet contains a fairly low amount of cholesterol, it also contains lecithin, which is an excellent preventative measure for the development of atherosclerosis in humans.

We have conducted a research on the content of cholesterol in blood serum and meat of rams by the enzymatic method of Stadman, T. C.<sup>12</sup> on an automated biochemical analyzer by Dimension Xpand company, Siemens.

For the quantitative determination of cholesterol were prepared tissues homogenates obtained during the slaughter of animals with the proportion of 10 g of meat and 20 ml of physiological solution of sodium chloride. These homogenates were twice centrifuged for 20 min, 3 000 R /min. The supernatant was collected and then were performed biochemical studies. The results were presented in mmol/l<sup>13,14,15</sup>.

According to the results of our investigation it was shown that in the meat of rams of the I type the cholesterol content in the meat amounted to 1.56 mmol/l, and in the II type - 1,67 mmol/l, slightly lower than in the comparative scientific literature (2,36).

In addition, we found that the content of cholesterol in the blood of Dejaresco rams of the I type was - 1.55 mmol/l and in the II type - 1.68 mmol/l, respectively.

As for the intergroup differences in the content of cholesterol in the blood and in muscle, they were insignificant and statistically unreliable.

### REFERENCES

1. Adylkanova Sh. R. Genetic potential of meat productivity of zhanaarka intrabreed type of the Saryarka sheep breed. Research, results, <sup>11</sup>, Almaty: 2010. – pp. 84-86

2. Ermekov M. A., Golodnov A. B. Fat-tailed sheep of Kazakhstan. – Almaty: Kainar, 1976. – p.110
3. Sadykulov T. S., Adylkanova Sh. R. Prospects of development of the domestic meat-fat tail sheep breeds. Agricultural science - agricultural production of Kazakhstan, Siberia and Mongolia, volume II Proceedings of the XII International scientific - practical conference. Shymkent on April 16-17, 2009, pp. 217-220
4. Willams A.J. Progress in breeding sheep for carpet wool production in Australia. – *Wool Technol. And sheep Breeder*, 1997, **25**,2:15-21
5. National Screening programmer for hairy sheep. – *The N.Z. Farmer*, 1978, **94**, 15:61, 63-65
6. Exotic sheep for Australia. – *Rural res.*, 1974, **83**; D. 15-20
7. We are not alone. – *Shepherd*, 1994, **19**: 11:5,8;18
8. Ćarpet wool frot. Hairy breeds studikd. New Zealand Farmer, estoc section, 1989, 96,9:69
9. Perenoalewoot-what to aim for. – *N.Z. meat and woot*, 1998, October; 26-31
10. Sadykulov T. S. Degrassie sheep. - Almaty: Kainar, 1985. – p.205
11. Sadykulov T. S., Zhazylbekov K. G, Kim, G. L. Methods for creating of area-type dejahresco fat-tailed breeds of sheep. Materials of the IV intern. scientific.-pract. conf. Ulaanbaatar (Mongolia), 2001
12. Stadman T.C. Methods in Enzymology, Vol. 3, Colowick, S.P., and Caplan, NO (Eds.), Academy Press, New York, NY, 1957, pp 392-394, 678-681
13. Flegg H.M. An investigation of the determination of serum cholesterol by an enzymatic method, *Ann ClinBiochem* 1973; **10**: 79-84
14. Roschlau P., Bernt E.M., Gruber W. enzymatic Bestimmung des Gesamtcholesterins in Serum, *J ClinChemBiochem* 1974; **12**: 403-407
15. Rautela G.S., Liedtke R.J. Automated enzymic measurement of total cholesterol in serum, *ClinChem* 1978; **24**