

Omashev K.B., Candidate of Agricultural Sciences, **the main author**, <https://orcid.org/0000-0003-1140-7722>

Institute of Genetics and Physiology SC MSHE RK, Al-Farabi Ave. 93, Almaty 050060, Kazakhstan, okairly@mail.ru

Malmakov N.I., Doctor of Agricultural Sciences, <https://orcid.org/0000-0002-5242-6658>

Institute of Genetics and Physiology SC MSHE RK, Al-Farabi Ave. 93, Almaty 050060, Kazakhstan. Kazakh Research Institute of Livestock and Fodder Production, Zhandosov Str. 51, 050035 Almaty, Kazakhstan, nurlan_malmakov@mail.ru

Iskakov K.A., Ph.D., <https://orcid.org/my-orkid?orkid=0000-0002-8424-009X>

Kazakh Research Institute of Livestock and Fodder Production, Zhandosov Str. 51, 050035 Almaty, Kazakhstan, kairat11101988@mail.ru

Tastaganov M.A., junior researcher, <https://orcid.org/0000-0002-6008-0757>

Kazakh Research «Institute of Livestock and Fodder Production», Zhandosov Str. 51, 050035 Almaty, Kazakhstan, maksat0178@mail.ru

Sagdat E., Master of Engineering and Technology, <https://orcid.org/0000-0001-7605-9787>, «Kazakh Research Institute of Livestock and Fodder Production», Zhandosov Str. 51, 050035 Almaty, Kazakhstan, elbolsyn.sagdat.92@mail.ru

Mussayeva A.S., Candidate of Biological Sciences, <https://orcid.org/0000-0003-2871-1552>

Institute of Genetics and Physiology SC MSHE RK, Al-Farabi Ave. 93, Almaty 050060, Kazakhstan, aimus@mail.ru

Orazymbetova Z.S., Senior Researcher, <https://orcid.org/0000-0002-5085-8561>

Institute of Genetics and Physiology SC MSHE RK, Al-Farabi Ave. 93, Almaty 050060, Kazakhstan, orazymbetova.z@gmail.com

Bakhtybekkyzy Sh., Master of Technical Sciences, <https://orcid.org/0000-0002-0615-7880>

Institute of Genetics and Physiology SC MSHE RK, Al-Farabi Ave. 93, Almaty 050060, Kazakhstan, sholpan_bsb@mail.ru

Bekitayeva A.K., Master of Science, <https://orcid.org/0000-0001-7301-6626>,

Institute of Genetics and Physiology SC MSHE RK, Al-Farabi Ave. 93, Almaty 050060, Kazakhstan, aidana.bekitayeva@gmail.com

FEATURES OF THE EXTERIOR OF KAZAKH FAT-RUMPED COARSE-WOOLED SHEEP OF VARIOUS SEX AND AGE GROUPS

ANNOTATION

Sheep industry is an important branch of animal husbandry in Kazakhstan. The Kazakh fat-rumped coarse-wooled breed was developed by Kazakh people. Animals of this breed are popular in almost all regions of the country. There is evidence that the presence of extra vertebrae in sheep can affect meat production by increasing carcass length and carcass weight. The main purpose of this research is a comprehensive study of the exterior parameters of the Kazakh fat-rumped coarse-wooled sheep in the three farms: “Tokan 1” farm in Zhetysu region, “Razakhun” and “Atai” farms in Jambul region. The comparative characterization of age and exterior features revealed some differences between 4 months old ewe lambs, ram lambs, and breeding ewes on these farms. In terms of body size measurements, ewe lambs and breeding ewes in all farms were characterized by harmonious physique and well expressed meat forms, they expressed high level of meat performance. It should be noted that the sheep of “Tokan 1” farm had a significantly wider and longer body, as evidenced by the thoracic and stretch indexes. It can be assumed that sheep from this farm may be more responsive to selection for a long body by the formation of additional vertebrae and ribs.

Key words: *Kazakh fat-rumped sheep, ram lamb, ewe lamb, body weight, linear body measurements, body indices.*

Introduction. Sheep industry is an important branch of animal husbandry, rationally using the vast natural pastures of Kazakhstan with an area of 180 million hectares. Growing demand for food and the proximity of major markets such as China, Russia and Iran are driving growth in meat production for export and domestic market. The main trends in sheep industries in other countries are the growth in

numbers of specialized meat breeds, lamb production and increased meat productivity in sheep of all types of productivity.

In 2021, the number of sheep in Kazakhstan amounted to 18.6 million heads. The economic indicators of sheep breeding in Kazakhstan are calculated from the productivity of fat-rumped sheep, as they constitute about 80% of the total population and are well adapted to the conditions of year-round pasture grazing in harsh sharp-continental conditions [1]. That is why fat-rumped breeds of sheep are important.

The Kazakh fat-rumped coarse-wooled breed of sheep was developed by Kazakh people's selection. It consists of several population, differing from each other by the level of productivity and geographical breeding area. It is popular in all regions of the country. This breed has a high growth rate, especially in the first 16-18 months of development. The body weight of rams is 90-110 kg, breeding ewes - 60-65 kg, 4 months old ram lambs - 35-37 kg, 4 months old ewe lambs - 33-35 kg. Dressing yield of 4 months old lambs is 50-55%, carcass flesh yield is 79-80%. Prolificacy of ewes is about 110-120% [2].

Ordinary domestic sheep have 13 pairs of ribs. In the 2014 Annual Report, the Fine-Wooled Sheep Breeding Department at the Research Institute of Sheep Breeding reported that sheep with 14 pairs of ribs were found among Etti (meat) Merino sheep and provided a photo as evidence. In addition, our colleague Dr. Robert Stobart, a sheep and wool specialist from the Department of Animal Science at the University of Wyoming, in response to a letter about this case reported that 14 pairs of ribs are found in 25% of American Hampshires and Suffolks.

The vertebral column plays an essential role in the animal body. It consists of different types of vertebrae: cervical (C - cervical), thoracic (T - thoracic), lumbar (L - lumbar), sacral (S - sacral) and caudal (Cd - caudal). In most mammalian species, the cervical region consists of 7 vertebrae [3, 4]. In contrast to the cervical vertebrae, the number of lumbar, sacral, and caudal vertebrae varies more [5].

Variations in the number of vertebrae in the thoracic and lumbar regions of pigs are of great interest to livestock producers. Selection of pigs with longer backs has led to the possibility that they may have several more vertebrae than normal individuals, which have 19 thoracic and lumbar vertebrae [6, 7]. This selection has resulted in a 15 mm lengthening of the thoracolumbar region with each vertebra added [8].

In Mongolian sheep, an additional thoracic or lumbar vertebra increased spine length by 2.4 or 3.5 cm, respectively. Sheep with additional vertebrae influenced meat productivity by increasing carcass length and weight, length of the longest dorsal muscle and muscle eye area [9-11].

Studies of European breeds of Texel sheep, Scottish black-faced sheep and their littermates with Mule (crossbred lambs produced by Leicester rams and Scottish black-faced ewes, strong and unpretentious like mules) have shown that additional vertebrae can significantly increase body and carcass length [12, 13].

Furthermore, Li et al. (2017) [14] studied variations in the number of thoracic (T) and lumbar (L) vertebrae and their relationship to carcass length and carcass weight of 7-8-month-old Kazakh fat-rumped lambs (n=468) in Xinjiang, China. They found 7 variations in the number of vertebrae: 1) 13 thoracic and 6 lumbar (T13L6) vertebrae were present in 74.14% of the sheep; 2) T13L7 in 12.34%; 3) T14L6 in 10.68%; 4) T14L5 in 1.28%; 5) T12L6 in 0.64%; 6) T12L7 in 0.21% and 7) T14L7 in 0.21%. T13L7 and T14L6 lambs with one more lumbar or thoracic vertebrae compared to T13L6 lambs increased carcass length and carcass weight by 2.22 and 2.93 cm and 1.68 and 1.90 kg, respectively. The authors pointed out the economic benefit of the additional thoracic or lumbar vertebrae, as these parts are among the expensive cuts of the carcass. Also, Siqin et al. [15] reported that in China, 17.4% of Wuzhumuxin sheep had 14 pairs of ribs, 81% of offspring from 14-pair-rib parents had a 14-pair-rib father and a 13-pair-rib mother had 14 pairs of ribs. Increasing meat productivity by selection for 7 lumbar vertebrae was also promising [16].

The main purpose of our research is a comprehensive study of the exterior parameters of the Kazakh fat-rumped coarse-wooled sheep in the three farms.

Research materials and methods. One of the most widespread methods of accounting growth, development and stature of farm animals is determination of its live weight in different periods of life. The experimental part of the research was carried out on sheep of Kazakh fat-rumped coarse-wooled breed on "Razakhun" and "Atai" farms of Jambyl region and "Tokan 1" farm that located in Zhetysu region.

Constitutional and exterior features, adaptive qualities to local climatic and fodder conditions were studied. In this work, for comparative characterization age and exterior features of breeding ewes and 4-

months old ewe and ram lambs were studied. The live body weights of ewes and lambs were measured early in the morning before the movement of the flock to the pasture with the aid of an electronic scales TV-M-600.2- A1 (made in Russia) with a weighing limit of up to 600 kg and an accuracy of 100 g. Linear body size measurements, growth of skeleton and separate bones in weight and linear relation according to the generally accepted methods. Body build indices were calculated on the basis of the measurements obtained.

The obtained data were processed by the method of variation statistics using the Microsoft Office Excel 2007 program.

Results and their discussion. As it was already mentioned above, constitution and exterior are the most important indicators of breeding and productive qualities of livestock. Therefore, in practical breeding the most serious attention is paid to the accuracy and objectivity of animal evaluation by these indicators. In our studies, the live weight of ewe lambs by farms had some differences (table 1).

Table 1 – Body weight and body size measurements of 4 months old ewe lambs (n=50)

Indicator	Farm		
	“Razakhun”	“Atai”	“Tokan 1”
Body weight, kg	36.4 ±0,19	43.6±0,17	42.8±0,19
Height at withers, cm	64.2±0,25	69.4±0,25	63.8±0,21
Height at the hip cross, cm	65.6±0,23	70.2±0,25	66.0±0,21
Chest width, cm	19.9±0,20	20.6±0,15	27.7±0,22
Chest depth, cm	27.1±0,17	31.0±0,17	28.8±0,20
Chest circumference at shoulder blades, cm	85.8±0,37	84.7±0,22	88.1±0,53
Body oblique length, cm	49.1±0,30	54.6±0,23	56.3±0,19
Width in poppets, cm	13.6±0,13	14.6±0,12	15.5±0,16
Cannon circumference, cm	8.0±0,13	8.7±0,10	8.6±0,10

Body weight ranged from 36.4 to 43.6 kg. At the same time, the lowest mean body weight of 36.4 kg was observed in ewe lambs belonging to “Razakhun” farm. Their body weight was significantly less than one of the ewe lambs at the “Atai” farm by 7.2 kg or 16.5%, and at the “Tokan 1” farm by 6.4 kg or 14.9%.

When studying the growth and development of young Kazakh fat-rumped coarse-wooled sheep breed in farms, linear measurements of separate parts of the body were carried out to evaluate the exterior features of experimental individuals. In general, the given data of absolute measurements indicate that the lambs at 4 months of age are large enough and under the condition of pasture grazing provided full growth and development.

Moreover, the obtained data and their analysis indicate certain differences in the development of individual body parts in ewe lambs. The best indicators of growth measurements were observed in the ewe lambs at the “Atai” farm: height at the withers - 69.4 cm, height at the hip cross - 70.2 cm and at the same time they had deep (chest depth - 31.0 cm), but less wide chest (chest width - 20.6 cm) than contemporaries at the “Tokan 1” farm (chest width - 27.7 cm). Ewe lambs at the “Tokan 1” had a barrel-shaped, long body as evidenced by measurements of chest circumference behind the shoulder blades - 88.1 cm, paunch girth - 56.3 cm, and macula width - 15.5 cm. No regular differences were found when measuring the cannon circumference, which characterizes the strength of the physique of the experimental lambs.

It is known that with all information about body size measurements do not provide complete and objective picture of exterior features and characterizes the type of physique. In this regard, body build indices were determined, which are separate ratios of interrelated measurements of body parts. The importance of calculation of body measurement indices is due to the fact that on their basis it is possible to select promising animals for improvement of meat qualities of Kazakh sheep. In this case, tall, wide and long bodied animals characterized by a high level of meat productivity are desirable.

In order to provide more complete and objective assessment of changes in body proportions and body type of the ewe lambs, the determination of body build indices was carried out (table 2). The obtained data and their analysis indicate that body proportions and values of physique indices have changed in 4 months old ewe lambs as a result of growth and development. The ewe lambs of “Atai” farm

were taller than their contemporaries on other farms. Their long-legged index was of 24.8, while in their contemporaries in “Tokan 1” farm it was lowest of 18.8.

Ewe lambs at the “Tokan 1” farm were more stretched with barrel-shaped physique and with correct ratios of body proportions, as evidenced by high indices of stretchiness - 88.2, thoracic - 96.4, compactness - 156.6, massiveness - 138.0, bony - 13.4 and overgrowth - 103.3.

Table 2 – Body build indices of 4 months old ewe lambs (n=50)

Farm	Indices, %						
	Long-legged	Stretchiness	Thoracic	Compactness	Massiveness	Bony	Overgrowth
“Razakhun”	22,0	76,5	73,4	174,9	133,7	12,4	102,2
“Atai”	24,8	78,6	66,5	155,2	122,0	12,5	101,1
“Tokan 1”	18,8	88,2	96,4	156,6	138,0	13,4	103,3

The analysis of growth and development indicators of 4 months old ram lambs, presented in table 3, confirmed the differences observed at comparison of the ewe lambs at three farms. Ram lambs of “Atai” farm were heavier than lambs of “Tokan 1” farm by 5.3 kg or 10.8% and lambs of “Razakhun” farm by 8.5 kg or 17.4%.

Table 3 – Body weight and body size measurements of 4 months old ram lambs (n=50)

Indicator	Farm		
	“Razakhun”	“Atai”	“Tokan 1”
Live weight, kg	40,3±0,32	48,8±0,25	43,5±0,23
Height at withers, cm	65,3±0,29	73,2±0,20	67,0±0,21
Height at the hip cross, cm	67,2±0,28	74,8±0,21	69,2±0,20
Chest width, cm	21,2±0,23	22,8±0,15	31,0±0,20
Chest depth, cm	27,6±0,20	34,3±0,16	31,8±0,20
Chest circumference at shoulder blades, cm	86,0±0,30	87,1±0,18	90,1±0,53
Body oblique length, cm	52,0±0,23	58,4±0,21	57,3±0,19
Width in poppets, cm	13,7±0,18	16,4±0,13	17,5±0,16
Cannon circumference, cm	8,6±0,15	8,9±0,09	8,6±0,10

Measurement of body measurements also showed that “Atai” lambs were taller, had a narrow but deep chest and long body compared to their contemporaries from other farms. Insignificant superiority in measuring the paunch girth and width in the bones had lambs of “Tokan 1” farm. Cannon circumference did not show significant differences between lambs raised in different farms, which indicates the bone strength of the studied animals.

Table 4 – Body build indices of 4 months old ram lambs (n=50)

Farm	Indices, %						
	Long-legged	Stretchiness	Thoracic	Compactness	Massiveness	Bony	Overgrowth
“Razakhun”	23,0	79,6	76,8	165,4	131,7	13,2	102,9
“Atai”	26,3	79,8	66,5	149,1	119,0	12,2	102,2
“Tokan 1”	19,5	89,5	97,5	157,2	134,5	12,8	103,3

Indicators in general characterize ram lambs of the Kazakh fat-rumped coarse-wool breed as long-bodied animals, with deep and wide chest and stretched physique. However, there were some advantages of lambs of “Atai” farm and “Tokan 1” farm over contemporaries from “Razakhun” farm. Particularly ram lambs of “Atai” farm were more long-legged with index of 26.3. Lambs of “Tokan 1” farm had a long body, with stretching index of 89.2, with well developed chest, as evidenced by the thoracic index of 97.5, well adapted to the conditions of pasture maintenance with massiveness index of 134.5 and with good development of overgrowth index of 103.3. The ram lambs of “Razakhun” farm, in turn, had superiority in terms of knockdown index - 165.4 and bone density - 13.2, which characterizes them as animals with proportionally developed bones.

Table 5 – Body weight and body size measurements of the breeding ewes (n=50)

Indicator	Farm		
	“Razakhun”	“Atai”	“Tokan 1”
Live weight, kg	59,5±0,25	67,4±0,26	70,3±0,20
Height at withers, cm	68,3±0,21	81,1±0,22	76,0±0,24
Height at the hip cross, cm	70,0±0,21	82,2±0,23	76,9±0,23
Chest width, cm	24,1±0,20	23,4±0,17	28,2±0,16
Chest depth, cm	32,3±0,18	34,5±0,22	34,7±0,21
Chest circumference at shoulder blades, cm	98,4±0,25	101,2±0,30	105,8±0,53
Body oblique length, cm	52,2±0,26	61,9±0,21	58,5±0,37
Width in poppets, cm	18,6±0,16	19,5±0,21	19,1±0,19
Cannon circumference, cm	9,4±0,10	9,5±0,10	9,8±0,17

Analysis of the live weight of breeding ewes from different farms showed that breeding ewes of “Tokan 1” farm heavier than ewes in “Razakhun” farm by 10.8 kg or 15.3% and than ewes in “Atai” farm by 2.9 kg or 4.1%.

Visual assessment showed that the ewe lambs of “Tokan 1” farm had high body condition (fatness), while ewe lambs at “Atai” and “Razakhun” farms had average body condition, which affected the live body weight indicators.

Analysis of the adult sheep measurements revealed the same trends observed in 4 months old ewe and ram lambs, i.e. in terms of body size measurements the advantage was given to the breeding ewes of the “Atai” farm, and in terms of measurements characterizing the development of the chest the advantage was given to the sheep of the “Tokan 1” farm. Length measurements were also higher in the sheep of the “Atai” farm, whereas low indicators of body measurements were found in sheep of the “Razakhun” farm.

According to the main physique indexes characterizing the ratio of body parts and harmony of their development, there are no regular differences between sheep of different farms. It is necessary to note that animals in “Atai” farm were taller with higher long-legged index. Sheep in “Razakhun” farm had a bunched and massive physique, while sheep in “Tokan 1” farm had average values on the main body build indices.

Table 6 – Body indices of breeding ewes (n=50)

Farm	Indices, %						
	Long-legged	Stretchiness	Thoracic	Compactness	Massiveness	Bony	Overgrowth
“Razakhun”	20,91	77,69	74,57	188,51	146,44	14,04	101,87
“Atai”	38,6	76,3	67,7	163,4	124,8	11,7	101,3
“Tokan 1”	30,3	76,9	81,2	180,8	139,1	12,9	101,1

Kotarev and Shatalova [17] note that body size indices well reflect the general body shape of the animal and of its individual systems. In their study, a comparison of the body size indices in lambs of Texel and Edilbay breeds showed that in the first months of life, the physique of young animals is significantly different from the physique of older animals. The lambs were taller, less long bodied and had larger linear body size measurements. By 12 months of age, animals become more compact and massive. Texel lambs had a higher long-legged index, showed superiority in the thoracic index, and were more compact and massive in comparison with Edilbay lambs. A similar picture was observed when analyzing our experimental data. In our study, well expressed meat forms were found in animals from the "Tokan 1" farm, which is probably the result of targeted selection in this farm for large body size, weight and length.

Mukhametzharova et al. [18] and Egorova [19] note that in sheep breeding the following indices are of greatest importance: long-legged, stretchiness, bony, compactness and thoracic. Mukhametzharova et al. [18] found that in South Kazakh Merino ram lambs at the "Batai-Shu" stud farm in all age periods the height measurements were greatest. At birth the heights at the withers and rump were greater than the body length. Egorova [19] published that with age, Edilbay ram lambs developed a compact body, well round meaty shape, and the profile was similar to a rectangle with some muscularity in the rear part of the body, which indicates their potentially high meat productivity. In our study, height measurements in 4-month-old lambs were also the largest, and with age the body became more and compact and meaty.

Conclusion. In general, adult breeding ewes and young ram and ewe lambs in all three farms were characterized by harmonious physique and well expressed meat forms, and expressed high level of meat productivity. This is due to the fact that during the whole period of growing sheep were in optimal conditions of housing and feeding, which contributed to their normal growth and development. It should be noted that animals in "Tokan 1" farm were more wide and long bodied, as evidenced by the thoracic and stretching indices. It can be assumed that sheep "Tokan 1" farm may be responsive to directed selection on long body and formation of additional vertebrae and ribs.

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REFERENCES

- 1 <http://ranking.kz/ru/a/reviews/pogolove-skota-i-pticy-dekabr-2021#>.
- 2 Zhumadilla, K. State and prospects of development of kurdy meat-sal sheep breeding in Kazakhstan. In the book "Zootechnical science of Kazakhstan: past, present and future" [Text] / K. Zhumadilla, N.K. Zhumadillaev // Mater. international. scientific and practical conf. Almaty 2014, p. 163-172.
- 3 <https://www.sheepmaster.ru/post/>
- 4 <https://www.youtube.com/watch?v=KecD9Adu4HM>.
- 5 Kasenov, T.K. New breed "Etti Merino" [Text] / T.K. Kasenov, A.A. Torekhanov, I.T. Karamshuk // Almaty 2011, 350 pages.
- 6 Spivakov, V.A. Kazakh meat fast-maturing semi-fine-wooled breed of sheep. [Text] / V.A. Spivakov, S.R. Ospanov, K.M. Kasymov // Almaty 2016, 206 pages.
- 7 Cherekaev, A.V. Sheep breeding of Kazakhstan. Edited by A.V. Cherekaev and K.U. Medeubekov. [Text] / A.V. Cherekaev, K.U. Medeubekov // M. 1977, 240 pages.
- 8 Galis, F. Why do almost all mammals have seven cervical vertebrae? [Text] / F. Galis // Developmental constraints, Hox genes, and cancer. J Exp Zool. 1999, vol. 285 (1): p.19-26. PMID: 10327647.
- 9 Hautier, L. Skeletal development in sloths and the evolution of mammalian vertebral patterning. [Text] / L. Hautier, V. Weisbecker, M.R. Sánchez-Villagra, A. Goswami, R.J. Asher // Proc Natl Acad Sci U S A. 2010, vol. 107 (44): p.18903-18908. doi: 10.1073/pnas.1010335107.
- 10 Pilbeam, D. The anthropoid postcranial axial skeleton: comments on development, variation, and evolution. [Text] / D. Pilbeam // J Exp Zool B Mol Dev Evol. 2004, vol. 302 (3): p. 241-67. doi: 10.1002/jez.b.22.
- 11 Yang, G. Genetic evidence for the introgression of Western NR6A1 haplotype into Chinese Licha breed associated with increased vertebral number. [Text] / G. Yang, J. Ren, Z. Zhang, L. Huang // Anim Genet. 2009, vol. 40 (2): p. 247-50. doi: 10.1111/j.1365-2052.2008.01820.x.

12 Mikawa, S. Identification of a second gene associated with variation in vertebral number in domestic pigs. [Text] / S. Mikawa, S. Sato, T. Awata // BMC Genet. 2011, vol 12: p. 5. doi: 10.1186/1471-2156-12-5.

13 King, J. Carcass length in the bacon pig; its association with vertebrae numbers and prediction from radiographs of the young pig. [Text] / J. King & R. Roberts // Animal Production, 1960, vol. 2(1): p. 59-65. doi:10.1017/S0003356100033493.

14 Li, C. Multi-vertebrae variation potentially contribute to carcass length and weight of Kazakh sheep. [Text] / C. Li, X. Zhang // Small Ruminant Research, 2017, vol. 150: p. 8-10, <https://doi.org/10.1016/j.smallrumres.2017.02.021>.

15 Siqin, Q. Relationships among muscle fiber type composition, fiber diameter and MRF gene expression in different skeletal muscles of naturally grazing Wuzhumuqin sheep during postnatal development. [Text] / Q. Siqin // Anim Sci J. 2017, vol. 88 (12): p. 2033-2043. doi: 10.1111/asj.12848.

16 Li, S. genome resequencing of Ujumqin sheep to investigate the determinants of the multi-vertebral trait. [Text] / S. Li, R. Luo // Genome. 2018, vol. 61 (9): p. 653-661. doi: 10.1139/gen-2017-0267.

17 Kotarev, V.I. and Shatalova E.M. Weight and linear growth of sheep of different genotypes. Sheep, goats, wool business 2018, No. 1, p. 8-11.

18 Mukhametzharova, I.E. Growth and development of South Kazakh Merino ram lambs from "Batay-Shu" stud farm depending on their genotype. [Text] / I.E. Mukhametzharova, E.I. Islamov // S.K. Shaenov, D. Ibraev // Bulletin of Science of the Kazakh Agrotechnical University named after S. Seifullin 2015, No. 1 (84), p. 119-124.

19 Egorov, K.A. Biological and productive characteristics of Edilbae ram lambs obtained from single and twin litters. [Text] / K.A. Egorov // Candidate of Agricultural Sciences Dissertation. Saratov State University named after N.I. Vavilov. Saratov 2018, 101 pages.

ТҮЙІН

Қой шаруашылығы Қазақстандағы мал шаруашылығының маңызды салалардың бірі болып табылады. Қазақтың құйрықты қылшық жүнді тұқымы халық селекциясы арқылы пайда болған. Бұл тұқымның қойлары елдің барлық аймақтарында кеңінен таралған. Қойларда қосымша омыртқалардың болуы ұшаның ұзындығы мен салмағын арттыру арқылы ет өндірісіне пайдалы әсер етуі мүмкін екендігі туралы деректер бар. Бұл зерттеудің негізгі мақсаты үш шаруашылықта: Жетісу облысындағы "Токан 1" шаруашылығында, Жамбыл облысындағы "Разахун" және "Атай" шаруашылықтарында қазақтың құйрықты қылшық жүнді тұқымның сыртқы дене бітімі параметрлерін жан-жақты зерттеу болып табылады. Қойлардың әртүрлі жыныстық жас топтарының дене бітім ерекшеліктерінің салыстырмалы сипаттамасын анықтау мақсатында, осы шаруашылықтардағы 4 айлық ұрғашы, еркек қозылар мен асыл тұқымды аналықтар арасындағы кейбір айырмашылықтарды анықтадық. Дене бітіміне келетін болсақ, барлық шаруашылықтардағы қозылар мен асыл тұқымды аналықтар үйлесімді дене бітімімен және жақсы анықталған ет формаларымен сипатталды, олар ет көрсеткіштерінің жоғары деңгейін көрсетті. Айта кету керек, «Токан 1» шаруашылығы қойларының денесі едәуір кең және ұзын болды, бұл кеуде қуысы мен созыңқылық көрсеткіштерінен көрінеді. Бұл шаруашылықтағы қойлар қосымша омыртқалар мен қабырғаларды қалыптастыру арқылы ұзын денелі қойларды сұрыптауға сезімтал болуы мүмкін деп болжауға болады.

РЕЗЮМЕ

Овцеводство является важной отраслью животноводства в Казахстане. Казахская курдючная грубошерстная порода была выведена народной селекцией. Животные этой породы популярны практически во всех регионах страны. Имеются данные о том, что наличие дополнительных позвонков у овец может повлиять на производство мяса за счет увеличения длины и веса туши. Основной целью данного исследования является всестороннее изучение экстерьерных параметров казахской курдючной грубошерстной породы в трех хозяйствах: хозяйстве "Токан 1" в Жетісуской области, хозяйствах "Разахун" и "Атай" Джамбульской области. Сравнительная характеристика экстерьерных особенностей различных половозрастных групп овец выявила некоторые различия между 4-месячными ярками, баранчиками и племенными овцематками на этих фермах. Что касается размеров тела, то ягнята и племенные овцематки во всех хозяйствах характеризовались гармоничным телосложением и хорошо выраженными мясными формами, они демонстрировали высокий уровень мясных показателей. Следует отметить, что овцы фермы "Токан 1" имели

значительно более широкое и длинное туловище, о чем свидетельствуют показатели грудной клетки и растянутости. Можно предположить, что овцы с этой фермы могут быть более восприимчивы к отбору по длинному телу за счет образования дополнительных позвонков и ребер.