

## Features of Aktogay Sheep of Different Lines

Nazym E. Alzhaxina<sup>1\*</sup>, Kyrgyzbay N. Begembekov<sup>1</sup>,  
Gulzhan A. Kulmanova<sup>1</sup>, Ahmet Aslan<sup>2</sup> and Asiya O. Utegenova<sup>3</sup>

<sup>1</sup>Kazakh National Agrarian University, 8 Abay Street, Almaty, Kazakhstan, 050010

<sup>2</sup>Ege University, Izmir, Turkiye, 35100 Bornova.

<sup>3</sup>State University Named After Shakarim of Semey, 20 A Glinka Street, Semey, Kazakhstan, 071412.

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An article is considered the creation history, current state and features of sheep of new farm lines the semi-coarse-wolled of the sheep of Aktogay population, bred based on use of animal different genotypes the fat-rumped sheep of breeds at the Aktogay region of the Karaganda region. It is provided data of a phenotypic variation of signs at linear animals. In posterity of linear breeder the specific weight of animals of desirable type is made 80 – 85%. Level of efficiency of the animal created new lines the semi-coarse-wolled sheep of Aktogay population at the pedigree farms of the Aktogay area considerably exceeds demands, made to animals of elite class with wool shearing rams for 20,0 – 35%, dams – for 18 - 30%, and on live weight, respectively: 13 – 16 and 6 – 8%.

**Key words:** Genotype, Breed, Population, Fitness of lines of sheep, Efficiency, Semi-coarse, Carpet wool, live weight.

Sheep breeding always played an important role in development of a national economy of the Central Kazakhstan which main territory occupies desert and semidesertic zones. This extensive territory, can be rationally used, generally, for a pasture the meat-fat-rumped sheep. Sheep of the fat-rumped breeds are well adapted for severe climatic conditions, are unpretentious to leaving and keeping, perfectly use for a fattening the desert vegetation, semi-desert vegetation and other pasturable grounds. Therefore, from the different directions of sheep breeding of the region, the first place is taken by fat-rumped sheep breeding, which is a source of production of high-quality mutton, sheepskin for production of

sheepskin coats, short sheepskin coat, velor, wool for carpet products, numnahs and dried products<sup>1</sup>.

From the total area of land fund of the Republic of Kazakhstan 272,5 million hectares as of January 1, 2000 agricultural holdings occupy 222,5 million hectares (81,7%), from them 185,2 million hectares or 68% of all territory of the republic – pastures, 21,9 million hectares (8%) – an arable land, 10,3 million hectares (3,8%) – abandoned fields, 5,0 million hectares (1,8%) – haymakings. It is 13 hectares of agricultural holdings, including about 2 hectares of an arable land; we have in counting on the one inhabitant<sup>2</sup>. That is Kazakhstan possesses huge massifs of natural pastures with a fodder potential – 27-30 million ton of stern units, given by the nature annually. According to the World bank renewable vegetable resources of the above natural meadowlands in value terms exceed 1 bln. dollars USA<sup>3</sup>. If to consider, that in this territory live about 47% of all population of the republic, there is clear that relevance of rational use of the specified natural

\* To whom all correspondence should be addressed.  
E-mail: nazjomka@mail.ru

fodder grounds is never lost. In addition to that, it is also necessary to note, that non-use or insufficient use of natural pastures for a pasture of cattle can be lead to biological degradation of pasturable ecosystems<sup>4</sup>.

In the conditions of the Aktogay region of the Central Kazakhstan till 30<sup>th</sup> years of the XX century practically all livestock population of sheep was presented by the one direction – fat-tailed meat-fat-rumped *coarse-wolled* sheep breeding. At a solution of the problem of improvement of efficiency of sheep breeding in Kazakhstan and a mass metization of local cattle with cultural foreign breeds of that time, it was pursued the aim of a combination of high early maturation of merinos and Kazakh fat-rumped sheep, increase of fertility, improvement of wool and meat qualities at again created herds<sup>5</sup>. For this purpose in 1937 by the Kazakh institute of animal husbandry there was organized a complex base station in Kounrad (nowadays Aktogay) region of the Karaganda region for acceleration of promotion of a metization to regions of the Central Kazakhstan, which served six collective farms located down the river Tokyrauyn at the territory of the present Aktogay area, with a livestock of sheep over 6 thousand heads<sup>6</sup>.

As a result of the comparative analysis of long-term data on the main economic indicators of production of products of sheep breeding of the Aktogay area it is established that in these conditions of sheep of new semi-coarse-wolled “meat-fat-rumped and wool type” didn’t conceded to local Kazakh fat-tailed coarse-wolled sheep on fertility, fitness of dams, endurance and safety of young growth<sup>7</sup>.

On natural pastures they are successfully fattened, gain fatness quicker, well grow fat (accumulate fat on all trunk, whereas the Kazakh fat-tailed sheep accumulate fat generally on a fat tail), therefore they have considerably the high specific weight of animals of the highest fatness<sup>8</sup>. Together with it, sheep of new semi-coarse-wolled “meat-fat-rumped and wool type” Aktogay populations, owing to their higher wool efficiency and quality of wool fibers, are the source of a considerable reserve of economic recovery of farms in this zone.

Now in farms of the Aktogay region, the sheep of new semi-coarse-wolled “meat-fat-

rumped and wool type “Aktogay populations and their hybrids from use of ram-breeders of edilbayev, saryarkin, alay, tajik breeds, which are well adapted for specific conditions of the Central Kazakhstan are about 100 thousand heads and their quantity increases every year, covering all new zones of selection<sup>9</sup>.

At the territory of pastures of desert and semidesertic zones, which occupies 70% of the territory of natural pastures of the republic, for a long time it is bred generally Kazakh fat-tailed and karakul sheep of various breeds and populations heterogenous on level meat-fat-rumped and wool efficiency. Common fault of these sheep are low indicators as on quality of wool – it is coarse, color, with high content of low-quality (dry and dead) fibers, and by amount of wool efficiency<sup>10</sup>. Therefore, one of the important problems at cultivation the fat-tailed sheep is selection on increase in wool shearing, clarification and an upclassing of their wool caused also by that modern market conditions of maintaining branch of animal husbandry impose strict requirements to the range and quality of the made production.

The most optimum solution of this problem is creation in the specified zones of valuable breeding herds of new breeds, intra pedigree groups, types and lines the fat-tailed sheep, which at an origin community, similarity the meat-fat-rumped qualities and fitness to year-round use of seasonal desert and semidesertic pastures, have a number of specific biological and economic and valuable properties, and also their rational use by interpedigree crossing.

From this point of view a certain scientific and practical interest represents the new 3 farm lines of the semi-coarse-wolled animals of Aktogay populations of sheep, created in a zone the coarse-wolled fat-coarse sheep of the republic, approved by MA (Ministry of Agriculture) and the MJ (Ministry of Justice) of RK in 2009<sup>11</sup>. They, having kept valuable qualities (early maturation, endurance) of Kazakh fat-rumped sheep, considerably differs from the existing other breeds with the existence of rather big fat tail and high genetic potential on wool efficiency: very wide range of white and light gray high-quality carpet, semi-coarse wool of high assortments with wool shearing of the breeding rams, reaching in some cases to 12 kg and more.

## RESULTS AND DISCUSSION

### Creation of lines and breeding on lines

Creation of the line was begun with identification of the ancestor, salient on these or those signs<sup>12</sup>. It was organized their repeated check on quality of posterity already on the relevant group of the selected dams. Standards of the minimum indicators for selection of animals to the created lines on the main selected signs – live weight, wool shearing and wool length were developed.

Creation of the farm lines was gone parallel to formation of the selection group of animals from among an elite dams, which were kept to requirements planned lines. On the basis of data about origins, appraisal and efficiency, there was created the groups of the dams (60 – 80 heads counting on 1 ram estimated on quality of posterity), meeting the requirements of planned lines.

Further formation of the line was made by annual selection to the ancestor, meeting the standard of the related and unrelated dams of selection group, avoiding broad application of close and close inbreeding.

Grandsons, great-grandsons chosen in the beginning from among successors of the line<sup>13</sup>. Selection of linear animals were spent previously at weaning them from mothers, then at the main appraisal at one-year-old age, taking into account requirements of the standard, related accessory, the phenotypic features and evidence of the type of line at animals<sup>14</sup>.

The final stage of selection of animals to the line, results of check on quality of posterity were from received at linear selection. Thus the rams were excluded, which giving less than 70% of the posterity, confirming of the line type from linear selection.

Selection of sheep in lines were carried out only according to individual, taking into account their family tree, their phenotypic features and results of the previous pairings. Moderate inbreeding (coefficient of inbreeding – 6,25%) was applied to preservation and strengthening of genetic and phenotypic similarity to the ancestor of the line at selection<sup>15</sup>. The analysis of results of selection in lines according to records in breeding cards of dams was kept systematically.

The received posterity was subjected to a careful assessment and for further cultivation left animals with the best development and a combination of those signs on which the line was put.

For the purpose of preservation of such valuable biological features local fat-rumped sheep as strength of the physical build and fitness to extreme conditions there was applied the year-round pasturable keeping in desert and semidesertic zones for development of which the new type of sheep was intended.

Now among the semi-coarse-wolled sheep of Aktogay population in breeding farms of the Aktogay region of the Karaganda region 6 lines were bred, from which 3 lines were approved by the MA RK, and patents as on new selection



**Fig. 1.** Sheep of new lines of Aktogay populations

**Table 1.** Standard for new lines of semi-coarse-wolled sheep of Aktogay populations

Group	Live weight, kg				Wool shearing, kg				Quality of wool, cm			
	Elite	I	II	III	Elite	I	II	III	Elite	I	II	III
Adult ram	90	85	80	75	4,0	3,5	3,3	3,0	The best	I class	I, II class	I, II, III class
Ram of 15 months	55	50	45	42	3,1	2,8	2,5	2,3	part of			
Adult dam	60	55	50	45	2,8	2,5	2,3	2,0	I class			
Young ewe of 15 months	45	42	40	35	2,5	2,3	2,1	2,0				

achievements in animal husbandry were given from the MJ of RK.

Sheep of desirable type of new lines the semi-coarse-wolled sheep of Aktogay populations had to meet the requirements, developed by us to the following standard (table 1), qualified to animals of classes elite and I.

Sheep of desirable type at the appraisal share on two classes: elite and the first, according to the established minimum requirements. The animals who are not meeting these requirements belong in the second and third classes

Conformational and constitutional characteristic of new lines the semi-coarse-wolled



**Fig. 2.** Collection group of new lines with lambs.



**Fig. 3.** Sheep of new lines of semi-coarse-wolled sheep Aktogay populations on a pasture of pedigree farm “Zhamshy” LLP of Karaganda region.

**Table 2.** Variability of signs of new farm lines

Sign of lines	Name of the line	<i>n, head</i>	Females		<i>n, head</i>	Males		
			$X + m_x$	$C_v, \%$		$X + m_o$	$C_v, \%$	
Live weight, kg	4 months	Konyr	30	34,8±0,76	6,6	30	36,3±0,66	10,0
		Aksary	24	33,1±0,77	7,7	32	34,8±0,61	9,9
		Shubarbet	26	34,1±0,97	7,4	26	36,1±0,65	9,1
	1 year	Konyr	30	45,8±0,82	9,8	96	57,9±0,25	7,4
		Aksary	24	44,1±0,81	9,0	78	55,0±0,27	8,6
		Shubarbet	26	45,1±0,89	10,1	86	54,2±0,26	8,9
	Adult	Konyr	30	64,9±1,21	10,2	21	99,0±1,30	6,0
		Aksary	24	64,0±1,48	11,3	12	97,0±0,77	7,5
		Shubarbet	26	66,4±1,41	10,8	14	101±2,16	8,0
Wool shearing, kg	1 year	Konyr	211	3,3±0,10	44,0	94	3,9±0,12	29,8
		Aksary	75	2,8±0,10	30,1	50	3,4±0,13	26,2
		Shubarbet	75	3,0±0,10	28,2	50	3,7±0,13	25,1
	Adult	Konyr	302	4,0±0,04	18,8	21	5,7±0,21	17,1
		Aksary	268	3,0±0,03	18,9	12	4,2±0,21	17,9
		Shubarbet	257	3,1±0,03	17,0	14	4,3±0,19	16,8
Length of wool, cm	Fluff	Konyr	302	10,0±0,11	19,4	21	10,0±0,40	18,3
		Aksary	268	11,0±0,13	19,3	12	12,0±0,64	18,4
		Shubarbet	257	7,0±0,08	17,4	14	8,0±0,35	16,5
	Lock of wool	Konyr	302	18,0±0,22	20,8	21	20,0±0,85	19,5
		Aksary	268	21,0±0,27	21,2	12	23,0±1,33	20,1
		Shubarbet	257	16,0±0,19	18,9	14	17,0±0,83	18,3

sheep of Aktogay populations in brief consists in the following.

These animals are large, with the strong constitution, with well-expressed meat-fat-rumped qualities. Wool is white and light gray, semi-coarse, with a lock wool structure, elastic and with normal gloss and an average sinuosity, the rune that is well balanced on the area. The locks of wool of different length are soft, consisting, generally from fluff, transitional fibers and insignificant quantity of an awn. They are in light gray wool, mainly from background of a fleece, and also in the locks of wool there are color fibers within 3-5%. Color is generally brown, red and white, and it is allowed existence of white and gray spots on the head and limbs. Animals are polled, and at rams are allowed rudiments of horns.

The exit of the washed wool makes 68-80%. Fertility of a dams is allowed within 104 – 110 lambs at the sufficient milkiness, providing normal development of young growth during the sucking period (100 – 130 kg of milk for a lactation), lambs at the separation at the age of 4-4,5 months have live weight: young rams – not less than 35 kg and young ewe – 30 kg<sup>[6]</sup>

#### **The ram line No. 2002 – “Konyr”**

Discriminating feature of representatives of this line is white semi-coarse wool of high quality on all trunk and brown color of the covering hair of the head and feet.

The progenitor of this line – is a ram No. 2002 – “Konyr”. It is a local semi-coarse-wooled animal in genotype of which it is had a blood from the degeress rams and dams of Kazakh fat-rumped sheep. The maximum efficiency of its efficiency is noted at the 4<sup>th</sup> summer age: live weight is 104 kg, wool shearing is 6,1 kg, length of fluff is 11 cm, length of a lock wool is 23 cm, an yield of the washed wool is 78%.

Average values of the best animals of this line make: rams have live weight – 99 kg, wool shearing – 5,7 kg, length of fluff – 10 cm, length of lock wool – 20 cm, yield of the washed wool – 77%, and dams have respectively – 62 kg, – 4,0 kg, – 10 cm, – 18 cm, 79%. Basic mass of animals of this line have the average tightened fat tail and thick white and light-gray semi-coarse wool of carpet type of high quality.

This line is characterized as “*the line with high-quality thick semi-coarse wool of carpet type*” [17].

#### **The line of a ram No. 1705 – “Aksary”**

Distinctive feature of representatives of this line is white color of a wool fleece with luster gloss on all trunk and existence on the covering hair of the head and feet, especially on ears, small light patches of a red color.

The progenitor of this line – is a ram No. 1705 – “Aksary” – the half-blooded animal, received from use of an alay ram No. 2810-1586 on semi-fine-fleece dam No. 0709 of Aktogay population. Alay ram No. 2810-1586 – is the representative of the line No. 1586 – “Ak” with a live weight of 4 years – 96 kg, and wool shearing – 4,9 kg. His son – is a half-blooded ram No. 1705 – “Aksary” of 3 years had live weight – 99 kg and wool shearing – 5,1 kg, white semi-coarse wool with luster gloss and small light patches of a red color on the head, feet and ears.

Rams of this line have live weight – 97 kg, wool shearing – 4,2 kg, length of fluff – 12 cm, length of lock wool – 23 cm, yield of the washed wool – 79%, and dam have respectively – 62 kg, 3,0 kg, 11 cm, 21 cm, 80%.

The line differs as “*the line of long-wooled animals*”<sup>[8]</sup>.

#### **The line of a ram No. 0806 – “Shubarbet”**

Sheep of this line differ the existence on the covering hair of the head and feet with the small light patches with brown, dark-brown colors.

The progenitor of this line – is a ram of tajik breed No. 0806 – “Shubarbet”. Its maximum efficiency is noted at the 4<sup>th</sup> years age: live weight – 106 kg, wool shearing – 4,2 kg, length of fluff – 9 cm, length of lock wool – 18 cm, yield of the washed wool – 67%. The ram had white semi-coarse thick wool of I grade, with good gloss, the big tightened fat tail.

Animals of this line have high combined meat-fat-rumped and wool efficiency. The average live mass of the best rams of this line makes 101 kg, wool shearing 4,3 kg, length of fluff – 8 cm, length of lock wool – 17 cm, yield of the washed wool – 68%, and dams have respectively – 66 kg, 3,1 kg, 7 cm, 16 cm, 70%.

The line differs as “*the line of sheep of the combined efficiency*”<sup>[9]</sup>.

Data of phenotypic variation of signs at the linear animals (table 2), which were grown up in identical paratypical conditions, testify to a sufficient selection of breeder-rams, and on group

of dams – to existence of high intra linear potential concerning increase of level of wool efficiency at the corresponding selection of animals<sup>20</sup>.

In posterity of linear breeders, the specific weight of animals of desirable type made 80 – 85%.

In general, the level of efficiency of the animal created new lines of the semi-coarse-wolled sheep of Aktogay population in the pedigree farms of Aktogay area is rather high. It considerably exceeds demands, made to animals of a class elite on wool shearing of rams for 20,0 – 35%, dams – for 18 - 30%, and on live weight, respectively: 13 – 16 and 6 – 8%.

Now it is conducted work on increase in number and improvement the semi-coarse-wolled sheep with white wool, received from different variation of crosses of new lines. Total number of animal new lines of the semi-coarse-wolled sheep of Aktogay populations at the republic makes over 30 thousand heads and their quantity increases every year, covering all new zones of breeding. The best herds of these animals are bred in 6 breeding farms of the republic (“MKS-Akboz” LLP of Panfilovskiy region of Almaty area and KKh “Babatay”, “Sarsenbek”, “Shormanov”, “Zhamshy” LLP of Aktogay region of Karaganda area).

As a result of the comparative analysis of long-term data on the main economic indicators of production of products of sheep breeding of Aktogay area it is established that in these conditions the sheep of new lines of the semi-coarse-wolled sheep of Aktogay populations didn't concede to local Kazakh fat-tailed coarse-wolled sheep on fertility, fitness of dams, endurance and safety of young growth. On natural pastures they are successfully fattened, gain fatness quicker, well grow fat (accumulate fat on all trunk, whereas the Kazakh fat-tailed sheep accumulate fat generally on a fat tail) therefore they have considerably the high specific weight of animals of the highest fatness.

Together with it, sheep of new lines of the semi-coarse-wolled sheep Aktogay populations, owing to higher their wool efficiency and quality of wool fibers, is a source of a considerable reserve of economic recovery of farms in this zone.

For further improvement the semi-coarse-wolled of sheep of Aktogay population it is

necessary to use as much as possible highly productive linear rams, and also to carry out the crosses of the line.

## CONCLUSION

Thus, as a result of long purposeful selection and breeding work there were created the new farm lines of the semi-coarse-wolled sheep of Aktogay population, bred on the basis of use of animal with different genotypes of the fat-tailed breeds in Aktogay region of Karaganda area. For the purpose of preservation of such valuable biological features local fat-rumped sheep as strength of the physical build and fitness to extreme conditions there was applied the year-round pasturable keeping in desert and semidesertic zones for development of which the new type of sheep was intended.

Sheep of desirable type of new lines the semi-coarse-wolled sheep of Aktogay populations had to meet the requirements, developed by us to the following standard (table 1), qualified to animals of classes elite and I.

Level of efficiency of the animal created new lines the semi-coarse-wolled sheep of Aktogay population at the pedigree farms of the Aktogay area considerably exceeds demands, made to animals of elite class with wool shearing rams for 20,0 – 35%, dams – for 18 - 30%, and on live weight, respectively: 13 – 16 and 6 – 8%.

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