metabolism. Folic acid (vitamin B) takes part in the transfer of one-carbon groups, participates in the biosynthesis of purine and pyrimidine bases, participates in the metabolism of methionine. Prevents intrauterine anomalies of the fetus, its growth and development. Cyanocobalamin (vitamin B12) normalizes methionine exchange, prevents fatty liver, increases oxygen consumption, stimulates protein synthesis.

The article shows the results of increasing production indicators in the breeding stock of the "Arbor Acres" cross when using the liquid form of the drug "Viusid Vet". Purpose of the test:

1. Increase in livestock safety
2. Increase in production of eggs
3. Increase in hatching egg yield percentage
4. Increasing the output of day-old chicks to initial laying

***Key words:*** cross, parental herd, hatching egg, day-old chick, resistance, stress, antioxidant

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## IMPROVING THE GENETIC POTENTIAL OF PRODUCTIVITY AND REPRODUCTIVE WOOL QUALITIES OF MEAT-AND-FAT SHEEP

*Abstract*

In Kazakhstan, sheep farming is the leading branch of agriculture. This is due to the unique natural, economic and climatic conditions associated with the nature of the terrain, as well as centuries-old traditions. Since ancient times, almost everywhere in Kazakhstan, sheep farming was based on the use of vast pasture lands. Edilbaevskaya sheep bred in the herd of the Yerzhan farm are characterized by high meat and fat productivity, early maturity and good adaptability to the natural, climatic and forage conditions of the southeast of Kazakhstan. The average weight of rams in the breeding group is 105-110 kg, wool yield is 3.2-3.5 kg, ewes, respectively, 73-76 and 2.2-2.4 kg. The average daily weight gain of rams from birth to weaning is 290-296 g, and 260-270 grams for ewes. Live weight and wool class are important selection traits for selection and selection for Edilbaev sheep of the Yerzhan farm when improving the productive and breeding qualities of sheep in the flock. It has been established that when selecting by live weight, it is recommended to sell rams for meat in two periods, taking into account market demand, at the age of 7-8 and 18 months.

***Keywords:*** *selection, stud ram, lamb, ewe, coarse wool, reproductive capacity, meatiness.*

### *Introduction*

In Kazakhstan, sheep farming is the leading branch of agriculture. A wide variety of systems of sheep farming have developed in the republic, ranging from year-round pasture to semi-stall-pasture. One of the main conditions for the intensification of the industry and further increase in sheep production is the creation of a sustainable feed base [1].

The solution to the problem of increasing feed production should be implemented by improving low-yield natural forage lands, creating long-term cultural pastures, as well as a wider introduction

into practice of progressive systems of forage procurement and storage, the use of loose and granulated feed mixtures in feeding animals [2].

The diversity of natural and economic conditions in the agricultural sector, the different levels of intensification of livestock industries determine the use of various systems and methods of feeding and keeping sheep [3].

The most common of these are stall-pasture or pasture-stall, and in some areas year-round stall keeping of sheep [4].

With pasture-stall keeping, sheep are kept in stalls for a certain period, depending on climatic conditions and the state of the forage base, and in the summer - on natural pastures.

The organization of adequate feeding of sheep with this system of keeping is of decisive importance for obtaining high-quality meat and wool products [5].

It is most profitable for farms to breed sheep that have high meat and wool productivity combined with early maturity. The breeds of sheep bred in the republic have a clearly defined main direction of productivity: the ratio of Edilbaev and Aktobe ewes of the semi-coarse wool breed ranges from 107 to 122% [6]. Fine-wool sheep breeds produce fine, soft wool of high quality, and early-maturing meat sheep breeds produce high-quality mutton. An analysis of the rate of development of sheep farming shows that the overall production, procurement and processing technology of sheep products do not yet meet modern requirements [7].

In the practice of world sheep breeding, an important place is given to crossing local aboriginal breeds of sheep with factory breeds of different productivity directions, using world gene pools. Such methods allow to increase the volume of sheep products produced in a short period of time and improve their quality. The resulting crossbreeds are distinguished by their early maturity and are not inferior to the original breeds in terms of productivity [8].

In connection with the above, scientific research on the creation of a meat-fat herd of sheep in the south-east of Kazakhstan based on crossing local coarse-wool fat-tailed sheep with rams of the edilbaev breed and the study of their productive qualities are relevant.

The completed scientific research is an integral part of scientific research on the PCF on the topic: "Improving the meat productivity of fat-tailed sheep using new methods of selection, genetics and biotechnology.

Much attention is paid to improving reproductive qualities. Meanwhile, much still needs to be done to improve the wool and meat qualities of sheep intended for meat [9]. In European countries, pasture-stall keeping of sheep predominates. In this regard, the productivity of sheep there is higher compared to the countries of Asia and Africa, where sheep are kept on pastures all year round. The concentration of livestock in this case ensures a high return on investment and allows for the improvement of animal husbandry methods [10].

In our conditions, in order to obtain full-fledged breeding ewes, it is necessary to radically change the existing technology of their cultivation. In this regard, the relevance of our work is to work out and recommend an optimal technology for obtaining and using ewes for reproduction at the age of 1.5 years, as well as to carry out fattening of super-replacement young animals in order to obtain high-quality young mutton, in relation to the specific conditions of the southeast - a zone of traditionally intensive development of agriculture [11].

***Materials and research methods***

The aim of the study was to study and conduct research work to improve the productivity and some biological characteristics of meat-fat coarse-wool fat-tailed sheep. The experimental part of the work was carried out in the peasant farm "Yerzhan" of the Almaty region in a flock of sheep of the Edilbaev breed. Two flocks of full-aged ewes with a number of 500-550 heads were used for the experiment.

***Results of the discussion***

In one flock, an experiment was conducted to select parent pairs by live weight, in another - by wool quality (grade). To conduct the experiment on selecting parents by live weight, full-grown ewes were divided into three groups: I - with a live weight within 61-65 kg (small), II - from 66 to 70 kg (medium), III - 71 kg and above (large). Two groups of rams were used on the ewes of each group:

Group I (n=3) with a live weight within 95-100 kg (medium) and Group II (n=3) - from 101 to 110 kg (large). As a result, six groups of lambs were obtained, both from homogeneous and heterogeneous selection with the following options (ram x ewes): I - medium x small, II - medium x medium, III - medium x large, IV - large x small, V - large x medium, VI - large x large.

The animals of the «Yerzhan» farm are characterized by consolidated heredity, typicality, high potential for meat and fat productivity and high growth energy of lambs. A valuable biological feature of these sheep is that adult animals and young animals make good use of the forage and climatic conditions of desert and semi-desert zones in certain seasons of the year. The breeding sheep of the «Yerzhan» farm are represented by typical animals, distinguished by a unique body type and high productivity compared to other offspring of Kazakh fat-tailed sheep.

In the «Yerzhan» farm, a selection group of 2.8 thousand heads of ewes was created with a live weight of adult ewes of 75.6 kg and a wool yield of 1.43 kg (Table 1).

The main rams have a live weight of 109.8 kg on average, and at the age of 1.5 years, the young animals reach 65 and 83% of the body weight of adult rams and ewes, respectively.

**Table 1 -** Productivity of sheep of the breeding group of the farm "Yerzhan"

| Age and gender group | Class | Number of heads, n | Live weight, kg | | Wool sheared, kg | |
|---|---|---|---|---|---|---|
| | | | M±m | σ | M±m | σ |
| Adult rams | 1stclass | 430 | 109,9±0,29 | 3,30 | 2,2±0,02 | 0,29 |
| Adult queens | 1stclass | 2072 | 75,6, ±0,09 | 2,13 | 1,43±0,01 | 0,11 |
| Bright 16 months | 1stclass | 700 | 63,2±0,12 | 1,19 | 1,17±0,07 | 0,25 |
| Rams 14-15 months old for breeding sale | 1stclass | 560 | 72,0±0,14 | 1,30 | 0,9±0,03 | 0,13 |

Edilbaevskiye sheep of the «Yerzhan» farm are classified as meat and fat sheep by their main productivity. Their wool productivity is also quite well expressed.

A distinctive feature of edilbaevskiye sheep is that they have a deep chest with a strongly developed breastbone, a somewhat elongated body, a developed skeleton, and are also characterized by the intensity of growth of young animals during the milking period. Productivity of rams and ewes used in the selection The stud rams used in the experiment were full-grown, and in terms of body type and the level of selection traits they met the requirements of the edilbaevskiye breed standard (Table 2).

**Table 2 -** Live weight, yield, length and wool grade of rams selected for the experiment (n=3)

| Indicator | Selection by live weight | | Selection by wool quality | |
|---|---|---|---|---|
| | I group middle | II group large | I group with the second class of wool | II group with the third class of wool |
| Live weight, kg | 98,6±0,94 | 108,0±1,41 | 105,3±0,47 | 101,6±0,95 |
| Wool sheared, kg | 3,50±0,08 | 3,58±0,12 | 3,54±0,10 | 3,10±0,08 |
| Length of braid, cm | 16,8±0,46 | 19,6±0,50 | 20,4±0,52 | 14,4±0,44 |
| Height of down zone, cm | 8,9±0,06 | 8,8±0,05 | 8,8±0,05 | 7,3±0,04 |
| Fluff/sheen ratio, % | 53,0 | 44,9 | 43,1 | 50,7 |

Rams of the II group or large ones had an average live weight of 108.0 kg and surpassed their peers of the I group or medium ones by 9.5% (P> 0.99). Large rams surpassed medium ones in wool shearing as well – by 2.3%, but the difference is not significant. Rams of the I group were 16.6% (P> 0.95) inferior to their peers of the II group in terms of the length of the braid, but the former had a small and insignificant advantage over rams of the second group in terms of the height of the down zone – by 1.1%. The ratio of down fibers to guard fibers was 53.0 and 44.9%, respectively.

As is known, the higher the indicator of this ratio, the better the quality and technological properties of the non-uniform wool. Rams with the second wool class, used in the selection based on wool quality, had a slightly higher average live weight than their peers with the third wool class - 105.3 and 101.6 kg, respectively, or more by 3.6% (P> 0.95). The former had the highest indicators

for wool clip, braid length and down zone height - respectively 3.54 kg; 20.4 cm; 8.8 cm against 3.10 kg; 14.4 cm; 7.3 cm for the latter or more by 14.2; 41.6; 20.5%.

The differences are reliable at P> 0.95-0.999. The down/outer fur ratio is 43.1 and 50.7%, respectively. But here it should be immediately noted that in this case one ratio still does not sufficiently characterize the quality of wool. Reproductive ability is one of the most important biological characteristics, which is interconnected with such indicators in sheep as fertility, survival of offspring and meat production per ewes. It is also determined by the hereditary characteristics of the animal and depends on the breed, feeding and housing conditions, age of the ewes, fatness, type of birth of parents, mating dates and intensity of use of producers and a number of other factors.

According to many authors, year-round maintenance on seasonal pastures and natural selection contributed to the development of meat-fat sheep as animals with low fertility.

We studied the reproductive capacity of ewes, depending on live weight, and the survivability of lambs and young animals obtained from the selection of parents by live weight (Table 4) in the herd of Edilbaev sheep of the Yerzhan farm in the Almaty region.

According to the experimental design, rams with a live weight of 95-100 kg (respectively, the live weight of ewes of groups I, II, III) and 101-110 kg and higher (respectively, IV, V and VI groups) were used in three groups of ewes with a live weight of 61-65 kg, 66-70 kg, 71 kg and higher.

The study of the reproductive capacity of ewes and the survivability of lambs was carried out in two adjacent years. The obtained data indicate that the Edilbaevskaya ewes of the Yerzhan farm are characterized by a fairly high fertilization capacity - the average indicator for this biological characteristic is within 95.7-96.7%. The fertility of the Edilbaevskaya ewes of this herd is at the level of other meat and fat breeds of sheep - within 106.9-110.2%. Within the experimental groups, the highest fertilization was characterized by ewes with a live weight of 66-70 kg, as well as their peers with a live weight of 71 kg and above - on average 96.6-96.7%. For ewes with a live weight of 61-65 kg, this indicator was slightly lower - by 0.9 and 1.0%.

With the increase in the live weight of the experimental ewes, the fertility rate slightly decreased and amounted to 108.9-110.2% in groups I and IV, 109.0-109.3% in groups II and V, and 106.9-107.0% in groups III and VI, respectively.

Apparently, this is explained by the fact that among ewes with a comparatively lower live weight (61-65 kg), there are more animals raised from twin lambs.

The greatest survival rate both from birth to weaning and from weaning to one year of age is characteristic of lambs and young animals obtained from ewes with a higher live weight. The average rate of this trait in groups II, V and III, VI is 97.9 and 97.8%, respectively, in the first studied period and 92.8-93.2; 93.0-93.2% - in the second. These indicators in groups I and III are 95.9 and 91.8-92.2%, respectively. There is a tendency towards an increase in the survival rate of lambs (sheep) obtained from the selection of parents with higher live weight.

**Table 3 -** Reproductive capacity of ewes and survival of lambs when selecting by live weight

| Indicator | unit of measure | Group | | | | | |
|---|---|---|---|---|---|---|---|
| | | I | II | III | IV | V | VI |
| *In the first year of experience* | | | | | | | |
| Inseminated queens | heads | 93 | 95 | 86 | 97 | 83 | 86 |
| Lambed | heads | 89 | 92 | 83 | 93 | 81 | 83 |
| Fertility of queens | % | 95,7 | 96,8 | 96,5 | 95,9 | 97,6 | 96,5 |
| Total lambs received | heads | 98 | 101 | 89 | 101 | 88 | 89 |
| Fertility | % | 110,1 | 109,8 | 107,2 | 108,6 | 108,6 | 107,2 |
| Preservation of lambs for weaning | % | 95,9 | 98,0 | 97,7 | 96,0 | 97,7 | 97,7 |
| Preservation of ewes from weaning to one year of age | % | 92,0 | 92,3 | 92,5 | 92,7 | 92,5 | 92,5 |
| *In the second year of experience* | | | | | | | |
| Inseminated queens | heads | 91 | 89 | 92 | 91 | 95 | 94 |
| Lambed | heads | 87 | 86 | 89 | 87 | 92 | 91 |
| Fertility of queens | % | 95,6 | 96,6 | 96,7 | 95,6 | 96,8 | 96,8 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total lambs received | heads | 96 | 93 | 95 | 95 | 100 | 97 |
| Fertility | % | 110,3 | 108,1 | 106,7 | 109,2 | 108,7 | 106,6 |
| Preservation of lambs for weaning | % | 95,8 | 97,8 | 97,9 | 95,8 | 98,0 | 97,9 |
| Preservation of ewes from weaning to one year of age | % | 91,6 | 93,3 | 93,5 | 91,5 | 93,7 | 93,7 |
| *On average for 2 experiences* | | | | | | | |
| Inseminated queens | heads | 92 | 92 | 89 | 94 | 89 | 90 |
| Lambed | heads | 88 | 89 | 86 | 90 | 86 | 87 |
| Fertility of queens | % | 95,7 | 96,7 | 96,6 | 95,7 | 96,6 | 96,7 |
| Total lambs received | heads | 97 | 97 | 92 | 98 | 94 | 93 |
| Fertility | % | 110,2 | 109,0 | 107,0 | 108,9 | 109,3 | 106,9 |
| Preservation of lambs for weaning | % | 95,9 | 97,9 | 97,8 | 95,9 | 97,9 | 97,8 |
| Preservation of ewes from weaning to one year of age | % | 91,8 | 92,8 | 93,0 | 92,2 | 93,2 | 93,2 |

Thus, this indicator in the groups of ewes obtained from fathers with a live weight within 95-100 (I-III groups) in the period from weaning to one year was 91.8-93.0%, and from fathers with a live weight of 101-110 kg - (IV-VI groups) - 92.2-93.2%.

Thus, the ewes of the edilbaevskaya breed of sheep of the «Yerzhan» farm are characterized by a fairly high degree of fertilization ability, low fertility - within 106.9-110.2%. More fertile were ewes with a relatively lower live weight within 61-65 kg.

The survival rate is higher in lambs obtained from ewes with a higher live weight. A tendency was found to increase the survival rate in ewes in the period from weaning to one year of age, obtained from the selection of parents with a higher live weight. In a comprehensive assessment of meat-fat sheep, the main attention is paid to their constitution, size and live weight, which ultimately affected the class composition of the ewes obtained from the selection of parents by live weight and wool class. When describing replacement ewes to a certain class, we took the size of the live weight and the expression of the signs of meatiness, fatness, and, inherent in individuals of this direction of productivity, body shape as the main criterion, since the development of these qualities in edilbaev sheep, as in all fat-tailed sheep breeds, underlies their vitality, adaptability to the conditions of breeding zones.

Breeding and genetic parameters of productivity of experimental young animals. The implementation of hereditary inclinations of the organism occurs under the direct influence of environmental factors. It is very important for the breeder to establish the degree of influence of hereditary and non-hereditary factors in the development of the general phenotypic diversity of each trait. Correct assessment and skillful use of these systems largely ensures success in targeted selection and selection. In Australian merino sheep, the phenotypic correlation between the mass of clean wool and the live weight is - plus 0.37, the shear of clean wool and its length - plus 0.47. The following correlation coefficients were established between the traits in kuibyshev sheep: live weight - shear of unwashed wool - plus 0.329; live weight - wool length - plus 0.079; shear of unwashed wool - wool length - 0.269, etc. In new type fat-tailed sheep with lightened wool, there is a positive correlation between their live weight and wool yield: in ewes - from + 0.13 to 0.54; in ewes - from + 0.33 to 0.46; in lambs - from + 0.67 to 0.69.

In our studies, the study of the relationship between the main selection traits in replacement ewes obtained from the selection of parents by live weight and wool class showed that the groups of animals have certain differences according to the studied selection and genetic parameter. In the groups of selection of parents by live weight, a reliable average correlation was found between the traits live weight - wool clip in ewes of the fifth group (large ram x average ewes) - 0.50; sixth (large ram x large ewes) - 0.54; between live weight and awn length - in ewes of the same groups - 0.42 and 0.37, respectively, and between wool clip and awn length - in ewes of the sixth group - 0.38 ($P > 0.95$ - 0.999).

According to the groups of selection of parent pairs by wool class, a reliable relationship from small to medium degree was found between the live weight and wool yield of ewes of the first group (ram with wool class II x ewes with wool class II) - 0.28; the second (ram with wool class II x ewes with wool class II) - 0.56; the fifth (ram with wool class III x ewes with wool class II) - 0.34; between the live weight and the length of the awn hair - of the second ewes - 0.32; the third (ram with wool class II x ewes with wool class III) - 0.28; the fifth - 0.28 and between the wool yield and the length of the awn hair - of the second ewes - 0.30; the fifth groups - 0.30 ($P \leq 0.95$ - 0.999).

Summarizing the above data, it can be concluded that at this stage of development of the Edilbay breed of the Erzhan farm, the following established correlations are characteristic between the main productive characteristics of replacement ewes: live weight - wool clip, live weight - awn length and wool clip - awn length. These correlations were established mainly in ewes obtained from those selection options where the largest number of animals of the desired type were obtained: in the selection groups by live weight, the fifth and sixth groups (where the output of elite and first-class ewes, respectively, is 92.9 and 91.2%) and in the selection groups by wool class: the second, third and fifth groups (respectively 91.3; 90.7 and 90.7%).

In the ewes obtained from the other selection options, no reliable relationships were found between the main selection traits. This indicates that in these groups of ewes there is independent development of traits.

***Conclusions***

At the present stage of development of the edilbaevskaya sheep breed of the «Yerzhan» farm herd, the following correlations are characteristic between the main productive characteristics of replacement ewes: live weight - wool clip, live weight - awn length and wool clip - awn length. The named correlations were established mainly in ewes obtained from those selection options where the largest number of animals of the desired type were obtained. When improving the edilbaevskaya sheep of the «Yerzhan» farm, it is necessary, first of all, to take into account the live weight of the sires used in the selection according to this characteristic: it should be 1.4 - 1.6 times higher than the live weight of the ewe. When selecting for breeding, preference should be given to young animals with the second class of wool, and when selecting according to this characteristic, it is necessary to use as much as possible the sires that optimally combine high live weight with the second class of wool.

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## ЕТТІ-МАЙЛЫ ҚОЙЛАРДЫҢ ӨНІМДІЛІГІ МЕН КӨБЕЮ ЖӘНЕ ЖҮН ҚАСИЕТТЕРІНІҢ ГЕНЕТИКАЛЫҚ ӘЛЕУЕТІН ЖАҚСАРТУ

***Аңдата***

Қазақстанда қой шаруашылығы ауыл шаруашылығының жетекші саласы болып табылады. Бұл аумақтың рельефінің сипатына, сондай-ақ ғасырлар бойғы дәстүрлерге байланысты ерекше табиғи-экономикалық және климаттық жағдайларға байланысты. Ежелгі заманнан бері Қазақстанда қой шаруашылығы кең жайылымдық жерлерді пайдалануға негізделген. "Ержан" шаруа қожалығында отарында өсірілетін еділбай тұқымды қойлар жоғары ет-май өнімділігімен, ерте жетілуімен және Қазақстанның оңтүстік-шығысының табиғи-климаттық және жемшөп жағдайларына жақсы бейімделуімен сипатталады. Селекциялық топта аталық қошқарларының орташа салмағы 105-110 кг, жүнді қырқу – 3,2 – 3,5 кг, аналықта тиісінше 73-76 және 2,2 – 2,4 кг құрайды. Еркек козылар туылғаннан бастап өсіп жетілу кезеңіндегі енесінен бөлгенге дейін орташа тәуліктік массасы 290-296 г, ұрғашыда 260-270 грамм. Тірі салмағы мен жүннің класы отар қойының өнімді және асыл тұқымды қасиеттерін жетілдіру кезінде "Ержан" шаруа қожалықта еділбай қойлары үшін таңдау мен

іріктеудің маңызды селекциялық белгілері болып табылады. Тірі салмақ бойынша іріктеу жүргізу, нарықтық сұранысты ескере отырып, етке қошқарларды сату кезінде орташа 7-8айлық кезінде немесе 18 айлық кезінде екі мерзім уақытта өткізу ұсынылатыны анықталды.

***Кілт сөздер:*** селекция, аталық қошқар, қошқар, қой, қылшық жүн, көбею қабілеті.

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## УЛУЧШЕНИЕ ГЕНЕТИЧЕСКОГО ПОТЕНЦИАЛА ПРОДУКТИВНОСТИ И ВОСПРОИЗВОДИТЕЛЬНЫХ ШЕРСТНЫХ КАЧЕСТВ МЯСО-САЛЬНЫХ ОВЕЦ

***Аннотация***

В Казахстане овцеводство является ведущей отраслью сельского хозяйства. Это обусловлено своеобразными природно-экономическими и климатическими условиями, связанными с характером рельефа территории, а также многовековыми традициями. Издревле, почти повсеместно в Казахстане овцеводство базировалось на использовании обширных пастбищных угодий. Овцы эдильбаевской породы, разводимые в стаде КХ «Ержан» характеризуются высокой мясо-сальной продуктивностью, скороспелостью и хорошей приспособленностью к природно-климатическим и кормовым условиям юго-востока Казахстана. Средняя масса баранов производителей селекционной группы составляет 105 – 110кг, настриг шерсти – 3,2 – 3,5 кг, маток соответственно 73-76 и 2,2–2,4 кг. Среднесуточный прирост массы у баранчиков за период от рождения до отбивки составляет 290 – 296г, у ярочек 260–270 граммов. Живая масса и классность шерсти являются важными селекционными признаками отбора и подбора для эдильбаевских овец КХ «Ержан» при совершенствование продуктивных и племенных качеств овец стада. Установлено, что при проведение отбора по живой массе, реализацию баранчиков на мясо с учетом рыночного спроса рекомендуется производить два срока, в возрасте 7-8 и 18 месяцев.

***Ключевые слова:*** селекция, баран-производитель, баранчик, овцематка, грубая шерсть, воспроизводительная способность, мясность.

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## INCREASING THE PRODUCTIVE QUALITIES OF KAZAKH FAT-FAT SHEEP AT DIFFERENT LEVELS AND NATURE OF FEEDING

*Abstract*

The article indicates that for the first time comprehensive studies are being conducted on the rational use of distant pastures and increasing the productivity of natural grasslands by rational grazing of farm animals in a specific project area, as well as the main feeds of the southeast of