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Meat Fine-Wool Sheep Breed - "Etti Merino" Bred In Kazakhstan

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Research Article

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ABSTRACT

In the article presents the history and methods of creation of new fine-wool breed "Etti merino" in Kazakhstan. Pre-conditions of its creation, and also use of breed, are in the fine-wool sheep breeding of Southern Kazakhstan.

INTRODUCTION

The successful conditions of a stable and cost-effective production of agricultural products are the creation of highly productive breeds of animals that have a great demand among the population. One of the top priorities for small-cost technology in our country is the presence of large areas of natural pastures. However, the reserve capacity of sheep production is not only to increase the number of livestock, but to increase the productivity of animals, and this is exactly what the sheep meat production is about at the moment. This shows the development of the sheep world production and, as the most efficient meat production, it justifies the cost. Currently, there is no doubt that such animals are competitive and meet the ever increasing requirements of the modern market [1, 2, 3, 4].

MATERIAL AND METHODS

Currently, there is a global trend of increasing demand for meat and meat products, including Kazakhstan [5,6,7,8,9,10]. Therefore, in our country, a great attention is paid to the production of meat, creating various state grant programs, such as "Sybaga" etc. Of all meat and meat products produced, 15-20% is mutton production, one of the traditional foods of the Kazakh people. To meet the needs in the demand for lamb it is important to create new regionalized specialized type of meat, meat-wool is mix-breeding and some absorption of local breeds. Since our country is characterized by extreme continental climate, it is vital to give maximum productivity and fertility reproduce only to those animals that are adapted to local climatic conditions and feed.

In Kazakhstan, such work has been done by a group of scientists led by Dr. of Agricultural Sciences; Professor Kasenova T.K. The purpose of the research was to create original fine-wool sheep with a high meat yield, based on changing the direction of selection. As a result, for the first time in Kazakhstan, "Etti Merino" was created by local breed meat merino. They combine high meat productivity, maturity and ability to pay off by their high food products, as well as producing excellent quality merino wool. Due to the high economic efficiency the merino meat is currently in high demand in sheep farms the Republic.

When creating this breed, methods of selection and specific choosing of the parental pairs were used in pure breeding and cross breeding of Kazakh fine-wool ewes with rams of German meat merinos, and their offsprings resulting from pure breeding and

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crossbreeding of different options, then they were bred "within themselves."

The works in this direction were started in 1980 in Almaty region. Having used the breed of Polvars, the interbreed type of Kazakh fine-wool sheep breed was created in Sarybulaksky region. The main difference was their largest size, high body weight and high wool clip. In the process of improving it it was found that high body weight was not a sufficient criterion for meat animals, which meant that it was necessary to work on increasing muscle mass, decreasing the output of bone and adipose tissue. With this purpose in 2001 the five heads of sheep breeds Merinofleyshshaf from Germany were brought to Kazakhstan.

RESULTS

The acclimatization quality of German sheep (MF) was studied to establish the influence of climatic conditions of the south-east of Kazakhstan on the general state of the imported animals. One of the indicators of the sheep adaptive qualities to new conditions were hematologic studied clinical and physiological parameters and fertility. Accordingly, the studies were on the blood tests from Table 1 showing that the imported sheep hemoglobin content was not lower than local sheep and physiologically healthy animals. That is, the data of biochemical blood tests showed that a change in geography, environment and feeding did not have a negative effect on the normal flow of the exchange-energy processes in the body. Morphological composition of the blood was the content of blood cells of German merino matching the physiological norms of healthy animals at the level of performance of local sheep producers. Erythrocyte sedimentation rate (on Panchenkov) was equal to - 0.6 mm \ h, in all seasons of the year, as the imported sheep, and a control group (CT), and corresponding to the clinical characteristics of healthy animals. ESR as nonspecific laboratory blood parameter reflecting the ratio of plasma protein fractions, changed in sedimentation rate that could serve as an indirect indicator of the current inflammatory or other pathological process. Consequently, there is no sign of inflammation or other pathological processes in animals, which meant the process of acclimatization of imported animals was without any complications.

Table 1: Hematological parameters of blood rams MF and CT.

Indicator		MF (4year)	CT(2heads)	Normal state
Haemoglobin head/year	winter	100±10,0	103± 3,33	90-133
	spring	105± 5,0	106,7± 3,3	
	summer	105± 10,0	106,7± 3,3	
	autumn	100 ±10,0	106,7± 3,3	
Leukocytes 10^9 /ltr	winter	8,2± 1,65	8,3± 1,3	6,0-14,0
	spring	8,4± 1,4	8,5± 1,2	
	summer	8,5± 1,3	8,9 ±1,02	
	autumn	8,5± 1,3	8,9 ±1,1	
Erythrocytes 10^{12} /ltr	winter	9,1± 0,1	9,0± 0,03	7,0-12,0
	spring	9,1± 0,1	9,0± 0,03	
	summer	9,1± 0,1	9,1± 0,03	
	autumn	9,1± 0,1	9,0± 0,03	
ESR, mm\hr	winter	0,6	0,6	(on Panchenkov)
	spring	0,6	0,7	0,5-1mm\hr
	summer	0,7	0,6	
	autumn	0,6	0,6	

The studies of clinical and physiological parameters of the experimental animals (Table 2), at all times of the health indicators showed that the imported sheep felt no worse than a Kazakh fine-wool breed. As it is known, in the summer, the temperature fluctuation of ambient air is much higher and in other seasons. During the experiments, the average daily temperature for the summer period was +20°C - +33 °C (temperature swings within 13 °C). In this case, an increase in body temperature seen in sheep breeds on Merinofleyshshaf was 1,5-1,7 °C, heart rate by 5-9 beats per minute, respiration by 3.5 strokes per minute, the Kazakh fine-wool, respectively, 1,4-1,6 °C, 2-3.5 beats per minute and 2.5 strokes per minute. This is explained by the fact that the summer is the worst in terms of thermoregulation. According to the clinical and physiological indexes of imported animals matched the clinical indexes of healthy animals body temperature within 38,0-41,0 °C, heart rate of 70-80 beats per minute, respiration 16-30 strokes per minute.

One of the characteristics of adaptation to the new conditions of breeding, as mentioned above, is the ability to reproduce. In this regard, the quantitative and qualitative composition of the seed of the imported animals in comparison with the local rams Kazakh fine-wool breed was studied.It was found (in the Table 3), the German sheep-producers in South-East Kazakhstan could produce good quality sperm with high mobility, suitable for artificial insemination of ewes. The German sheep medium single ejaculate was 1,04 ± 0,12 ml. or less than the Kazakh fine-wool which was per 0.5 ml, sperm count 2,90 ± 0,7 billion/ml or more for 0.66 billion seed characterized with excellent mobility 10 points and a dense concentration. The Kazakh fine-wool breed ewes inseminated semen sheep breed German Merinofleyshaff, insemination was most higher on average by 3-4% with higher fertility 6-

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13%. A range of indicators of hematological studies, clinical and physiological norms and reproductive capacity of the imported meat merino, in the new south-east of Kazakhstan, have shown great adaptability and ability to produce fertile offspring.

Table 2: Clinical data of experimental animals by season.

Indicator	Winter		Spring		Summer		Autumn	
	MF	CT	MF	CT	MF	CT	MF	CT
Quantity of heads	4	2	4	2	4	2	4	2
Time of the day	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
T of air, °C	-7	-7	-1	-1	+20	+20	+10	+10
T of body, °C	39,5± 0,05	39,6± 0,1	39,45±0,05	35,0 ± 0,1	39,5 ± 0,05	39,4 ± 0,05	39,5±0,05	35,0 ± 0,1
Pulse strokes/min.	77,0± 1,0	75,0± 1,0	77,0 ± 1,0	73,5 ± 0,5	85,0 ± 1,0	80,5 ± 0,5	76,0 ± 1,0	73,5 ± 0,5
Respiration strokes/min.	29,0 ± 1,0	28,0± 1,0	27,5 ± 0,5	25,0 ± 1,0	29,0 ± 1,0	29,0 ± 1,0	25,5 ± 0,5	24,0 ± 1,0
Time	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
T of air, °C	-4	-4	+4	+4	+29	+29	+18	+18
T of body, °C	39,5 ± 0,5	39,4± 0,1	39,8 ± 0,05	39,6 ± 0,05	39,6 ± 0,05	39,5 ± 0,05	39,9 ± 0,5	39,7 ± 0,5
Pulse strokes/min.	75,0 ± 1,0	74,0 ±1,0	79,5 ± 0,5	76,5 ±0,5	88,0 ± 1,0	82,0 ±1,0	79,5 ± 0,5	76,5 ±0,5
Respiration strokes/min.	30,0 ±1,0	29,0± 1,0	29,0 ± 1,0	28,0 ± 0,5	32,0 ± 1,0	31,5 ±0,5	26,0 ± 1,0	25,3 ± 0,5
Time	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
T of air, °C	-6	-6	0	0	+33	+33	+22	+22
T of body, °C	39,5±0,05	39,5±0,05	39,9 ± 0,05	39,7 ± 0,05	39,75±0,05	39,6 ± 0,05	39,9±0,05	39,7±0,05
Pulse strokes/min.	76,0± 2,0	74,5± 0,5	78,5 ± 0,5	76,5 ±0,05	89,5 ±0,5	83,5 ± 0,2	78,5 ± 0,5	76,5±0,05
Respiration strokes/min.	30,5± 1,0	29,5± 0,5	30,5 ±0,5	30,5 ±0,5	33,5 ±1,0	32,5±0,5	26,5 ±1,0	26,5±0,5

Table 3: Microscopic evaluation of semen.

Breed	Volume of ejaculate, ml	Sperm count million / ml	Sperm motility score,%	Concentration
MF	1,04 ± 0,12	2,90 ± 0,7	10 (100)	dense
CT	1,54 ±0,09	2,24 ± 0,4	10 (100)	dense

Crossing the Kazakh fine-wool ewes with rams of German meat merino showed that the offspring body weight increased by 10.9%. Slaughtering rams at 4 months of age are obtained with an average carcass weight of 16.9 kg with the increase by 11.4%. Under grazing with food supplements (up to 0.5 kg per day per head in the final period) of the Lambs 8 months of age could get a carcass weight 24,5-25,0 kg at slaughter yield to 50,0-52,0%. The output of meat was up to 85% in the carcasses, 15% of bone mass. Weight and yield offal at slaughter rams from German manufacturers totaled to the weight at slaughter with by-products I category - 1,02-1,42 kg or 3.6-4.1% of the pre-slaughter weight, II category - 3,03-3,49 kg or 9,8-10,1%. Gastrointestinal tract of the cross-breed of I category weighed 10-0,90 kg, which is 3,8-3,2% of net pre-slaughter weight of the animal, with purebred peers respectively of II category 3,2-3,1 kg or 0,84-0,73 %. Better development of the intestine promotes better digestion and maximum nutrient absorption digestible feed. The rams of German manufacturers had a long thin sections of small intestine - 25,2-24,6 m and colon - 6,6-6,3 m whereas from a peer Kazakh fine-wool sheep 26,7-22,0-20,5 m 5,7-5, 2m. Thus, the higher absolute weight and length of the vital organs and their winning of net pre-slaughter weight characterize animals from German manufacturers, as a maturing animal, with a high metabolism.

In order to establish the influence of German manufacturers in wool characteristics of local fine-wool sheep the histostructure sheep skin of German Merinofleyshshaf was investigated, which the Kazakh fine-wool breed ewes and offspring received, with their crossbreeds and purebred. The total thickness of the skin of sheep and MF CT which manufacturer used in the experiment was 2217,12-2368,90 microns. In hybrid animals it was 2322.61 - 2254.64 mm. The total thickness of the skin of ewes in MCTF was 1985,39-2099,80 microns CT 2028,82-2162,94 microns. We have bright MCTF up to 2221,54-2097,80 microns CT 2109,44-2153,60 microns. The superficial epidermal layer has the smallest thickness of from 23.71 to 27.70 m, or an average of 1.1% of the total thickness of the skin. We fine-wool sheep breeds Kazakh pillar layer is well developed and 1565.36 respectively, m or 67.4%. In rams pillar layer takes from 65.0 to 67.2%, the ewes of 63,2-65,8%. Plexiform layer with purebred rams MF and CT in terms of development is the smallest share. So it is in rams of the total thickness of the skin 33.7 - 33.9% in ewes being 35,7-34,2%. There is more at layer of the Kazakh fine-wool sheep. The greatest density of hair follicles differ from Merinofleyshshaf sheep (59.01) and superior on this indicator to the Kazakh fine-wool by 8.3%, from 56.6 hybrids MCTF wich occupies a middle position and being superior to the Kazakh fine-wool by 4.45%. The depth of both primary and secondary follicles is deeper than that of their peers and contemporaries breeds of Merinofleyshshaf and their hybrids with a thinned fleece. The depth of the primary follicles of sheep MF is 1497.36 and secondary 1445.34 m, and the ratio of these parameters is equal to 0.96, the width of the primary follicles - 69.70 mm

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and secondary - 62.91 m at a ratio of 0.90, which characterizes the wool as well equation. The Kazakh fine-wool sheep have the depth of 1528.98 m of primary follicles, secondary 1495.40 mm, the ratio of these indicates 0.98, the width of the primary follicles - 76.26 mm and secondary - 56.99 m at 0.75 against them. In CT of ewes, the occurrence of primary and secondary follicles is deeper than that of crossbred ewes. Based on the histological findings, the use of German rams had a positive impact on the wool productivity of offspring.

In the basic farms, producing sheep of "Etti Merino" has eight lines. PC "Plemzavod Almaty" has four lines. Three lines on the rams imported from Germany and one line in the pro-band of the own production. Manufacturer № 113 is characterized by large growth (height at withers 88 cm), body length (oblique body length 88 cm) and different forms of meat. The ram № 707 also has excellent meat forms, but has a more stocky body shape (height at withers 80 cm). The third producer № 719 earned the highest rating in Germany on average daily weight gain and the development of muscles. The ram of the own production number 08295 is characterized by great length of wool (11.5 cm) with distinct forms of meat.

There are three lines in PC Eskeldy. Two lines on the German rams - № 587 and № 024 and one at the manufacturer's own reproduction № 6120. The ram № 587 in the evaluation of their own productivity is characterized by a high average daily weight gain (22% compared to the average of their peers). The founder of the next line - producer № 024 has a better body has acquired major parts, with high rates of meat forms. The ram with the own reproduction number 6120 has a more dense hair and well-defined forms of meat.

In PA "Etti Merino", there is one line in the manufacturer's own sheep production number 07570. The line is characterized by high body weight, high wool clip and well-defined forms of meat.

The best breeds of merino meat are concentrated in PA "Etti Merino". In 2009, the live weight of 472 ewes had an average of 71.7 kg (maximum 92 kg), wool yield 6.9 kg (maximum 10.5 kg), one-year old ewes' average body weight of 59.3 kg (71.4 kg maximum) for wool yield 6.4 kg (maximum 8.6 kg). In 2010, the live weight at 518 ewes were on average equal to 72.1 kg (maximum 95 kg), 6.5 kg of wool clip (maximum 10.5 kg), a bright, respectively, 63.6 kg (75.0 kg maximum), 6.2 kg (maximum 9.0 kg).

As a result of years of selection and breeding work in 2011 there has been developed and successfully tested a new domestic breed of fine-wooled - "Etti Merino". The selection patent № 177 from 27.06.2011, the patent owner "Southwest Research Institute of Livestock and Crop Production", the authors: Kasenov T.K.; Torehanov A.A.; Zhumadillaev N.K.; Omashev K.B.; Seidaliev B.S.; Karamshuk I.T.; Kozhakeev J.; Sariev SM; Yesimov K.; Kegenbekov D.N.; Ospanov S.R. The sheep breed of "Etti Merino" exceeded Kazakh fine-wool breed in live weight by 18-20%, wool clipping by 6-8%. In the basic farm has 35,000 sheep, where livestock breeding animals are steadily increasing every year. In breeding flocks ewes' live weight is 60,0-70,0 kg and wool clip is 3.0 kg. The average live weight of lambs in 4-4.5 months of age is 35-36 kg.

As a result, the creation of new fine-wool breeds with distinct characteristics of meat has presented the ability to use their genetic potential to improve meat and wool productivity of domestic fine-wool sheep.

The South-Kazakhstan region breeds the South Kazakhstan merino, aiming at wool and meat production. The rams weigh 75-85 kg, and ewes 48-50 kg. Wool is mainly 64th-quality, length 8-8.5 cm in shearing sheep with physical mass of 10 kg, with ewes 4.0 kg. In the process of improving the breed, the weaknesses on meat productivity has been identified with the low body weight, lack of expression of meat forms. Therefore, it was decided to strengthen the selection and breeding work towards raising meat productivity, without compromising the fleece. Over the past 20 years there has become apparent the ineffectiveness of specialization in manufacturing only in wool industry, whereas in the present time to make lamb is considered cost effective, thus our first priority was to raise the energy of growth, improving the forms of meat and meat productivity hence increasing the South Kazakhstan Merino [11,12,13].

The LLP "Southwest Research Institute of Livestock and Crop Production" of Shymkent, in order to increase the body weight and quality of merino wool acquired a number of farms in the South Kazakhstan region in 2008-2009, using the frozen semen of sheep breeds of Polvars of JSC "Asyl Tulik "Astana. In 2010, to further improve the productivity of meat and South Kazakhstan wool merino two sheep breeds "Etti Merino" were brought from Almaty region and 20 heads were purchased in 2011.

As a result of the crossing offspring were obtained from 50% same blood parent breeds. Our results show that the ewes under study have a pretty good fertility within 96,5-95,5%. This number is higher by 1% in ewes, where we use the sheep-producing "Etti Merino". Fecundity of ewes ranged from 113.4% to 115.9%. By crossing the figure exceeds by 2.5-3.0% survival rate of lambs during the lambing crossbred lambs are better at 99.7%. Most live weight of lambs from crossbred rams EMYUKM - 4.2 -4.5 kg, one-year old ewes - 4.0 - 4.5 kg, YUKM rams-3.9 -4.2 kg, one-year old ewes - 3.7 - 4.0 kg. At weaning at 4 months of age, the same trend is body weight in crossbred rams - 32.7 - 35.5 kg, one-year old ewes 30.5 - 32.3 kg, with purebred rams - 32,7-33,4 kg, one-year old ewes 28.6 - 31.2 kg. The highest average daily weight gain in lambs crosses halfblood breeds on "Etti Merino" from rams is 260.0 g, the one-year old ewes - 235.8 g, y YUKM rams - 219.2 g, one-year old ewes - 205.0 g, respectively, greater than that 40.8gr or 18.6%, and 30.8 gr. or 15.0%. In addition to the live weight, the exterior features at birth were studied. The indicators of the

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tall purebred lambs: rams - 37.7 cm, bright - 36.9 cm, with purebred rams' counterparts - 37.5, 37.2 cm, one-year old ewes 36.7 and 36.5 cm, but at the same time by latitude for performance excellence crossbred animals. Bust a crossbred rams - 42.5, 41.3 cm, one-year old ewes - 39.5, 40.0 cm, width of chest rams 9.2, 9.0 cm, bright 8.5, 8.5 cm in width groin of rams 7.3; 7.1 cm, one-year old ewes 6.9 and 6.8 cm vs. 41.3 thoroughbred, 40.0 cm, 8.8, 8.3 cm, 6.9, 6.6 cm Indicators such as short stature and broad volumetric measurements are inherent of meat animals.

To study the efficiency of meat, slaughter characteristics were conducted of slaughter of purebred and crossbred rams. Lambs at the age of 4.5 months had a pretty good pre-slaughter live weight, varying in the range of 37.5 to 37.1 kg carcass weight were obtained from hybrids - 17.6 kg, thoroughbred - 16.5 kg, that is more EMYUKM to 1,1 kg or 6.6%. Slaughter yield in crossbred rams - 48.5%, with purebred - 45.5%. Pulp output in crossbred rams higher than purebred peers by 8.8%, the yield is lower than the bones of 2.4%. Meat ratio is above 3.3, respectively, in hybrids, a merino South Kazakhstan 3.0.

Growth and development of the lamb in the first months of life depends on the dairy ewes. In this regard, we have identified milking ewes. Milking ewes South Kazakhstan merino is high, which ensures normal growth and development of young suckling period and the rate depends on the number of lambs per litter. Thus, in double offspring have crossbred ewes with lambs, average daily milk yield was (3140g), and in ewes with double purebred lambs (3090g.). This is quite natural, since the ewes on live weight, as oppose to the parallel groups were analogues.

CONCLUSION

The use of rams' of "Etti Merino" in the farms of the South Kazakhstan region , the ewes of South Kazakhstan Merino showed that the offspring lambs are described as large, with a high body weight, and the fertility of ewes is increased by 2.5-3.0%, the survival rate of lambs from weaning is up to 2.7-3.0%.

Based on the above facts, our country should strongly promote meat breeds for the successful development of fine-wool sheep breeding [14,15,16,17,]. To obtain a rapid effect and emergency benefits it is suggested to use the existing specialized meat, meat-wool breeds and by cast-blooded, some absorption of local breeds to create regionalized meat breeds of sheep.

This is a unique achievement of scientists of Kazakhstan creating a domestic breed meat merino that successfully blends high meat productivity and merino wool; it creates positive momentum in the development of fine-wool sheep.

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