

## ABSTRACT

**of the dissertation work by Mukanova Lyazzat on the topic "Biological and productive qualities of the first generation hybrids obtained by crossing coarse-haired fat-tailed sheep (edilbay x hissar)", submitted for the degree of Doctor of Philosophy (PhD) under the educational program 8D08201 - "Technology of livestock production".**

**Relevance of the research topic.** Meat-fat sheep in the Republic of Kazakhstan are among the main breeds producing the cheapest meat in animal husbandry. In addition to meat, sheep breeds in this area are distinguished by the production of fat and wool. The production of the above products is carried out year-round using the most economically effective natural pasture feed. At the same time, this area of sheep farming is characterized by low costs and increases efficiency in a modern market economy.

Fat-tailed sheep breeds are distinguished by their strong physique, high live weight and meat and fat productivity, as well as the precocity of young animals. Since these indicators have economic and biological significance, it determines the level of growth and development of an organism at different stages of ontogenesis.

It is known that the problem of increasing the growth rate of farm animals is the most prominent among the topical issues not only of animal science, but also of biological science and practice. One of the primary tasks of animal husbandry all over the world is to provide meat products to the population in accordance with scientifically sound nutrition standards. Consumption of animal products is one of the main indicators of the standard of living of the population.

Currently, due to the sharp decline in demand for wool worldwide, much attention is being paid to the development of meat production in sheep farming. This is due to the increased demand for meat in market conditions. The global experience of sheep farming shows that increasing the efficiency and competitiveness of the industry is associated with a more complete use of sheep meat productivity.

Among the fat-tailed sheep bred in Kazakhstan, the edilbay breed is the most valuable in terms of meat and fat productivity. The edilbay sheep breed occupies one of the first places among sheep breeds bred worldwide in terms of live weight and meat and fat productivity. According to these indicators, they are insignificant, mainly in terms of fat, second only to the coarse-haired sheep of the hissar breed, which are mainly bred in Tajikistan. But they are somewhat superior to the hissar sheep breed in terms of the amount of wool produced, especially its quality and good adaptability to various harsh natural weather conditions. The edilbay sheep breed was bred by breeding in the regions of Western Kazakhstan, the Zhaiyk River and the Yedil River. The constitution is strong, the body and neck are long, pectoral, the chest is rather flat, the sternum protrudes forward, the withers are wide, the back is straight, the mass is heavy, the backbone is thick, the sacrum is wide. The coat color is predominantly brown, brown and red. The live weight of 4-month-old lambs in leading breeding farms is 38-45 kg, queens - 80-85 kg, and breeding sheep - 120-

150 kg. The slaughter yield of fattened sheep reaches 65%, the carcass weight with a rump is 85-95 kg, of which 30% is accounted for by the rump. Despite such high productivity indicators, a very important issue in domestic sheep breeding is the timely renewal of the blood of Siberian sheep and a further increase in the level of meat and fat productivity. Therefore, only hissar sheep are considered an improving breed.

The well-known hissar sheep breed is a highly specialized meat and tallow sheep breed that has been bred for many centuries on the basis of folk breeding and is currently being bred in Tajikistan and Uzbekistan in conditions of arid and hot weather. Large body size, high body weight, high meat yield and high-quality fat are special breeding and valuable economic properties of this breed of sheep. Live weight of rams is 130-140 kg, the best - 180-190 kg, queens - 70-75 and 100-120 kg, lambs reach 45-50 kg at the age of 4 months - at weaning.

In terms of meat and fat productivity, hissar sheep have the highest index among the breeds of world sheep breeding.

In general, hissar and edilbay sheep are considered the best in terms of meat productivity among sheep breeds bred worldwide. Crossing these two breeds of sheep with any other breed of sheep means a decrease in their meat productivity. That is, the improving breed for the edilbay sheep is the hissar breed of sheep, and for the hissar sheep it is the edilbay breed. Therefore, the improvement of meat productivity of each of these breeds is possible only by crossing with each other using an introductory and two-breed alternating crossing.

From this point of view, the study of the productive and biological qualities of offspring obtained by crossing sheep of the edilbay and hissar breeds with each other is of great scientific and practical importance in the field of animal science.

**The purpose of the dissertation research** is to study the phenotypic and genotypic variability of the main breeding traits of offspring obtained by crossing queens of the edilbay breed with sheep of the hissar coarse-haired sheepskin breed in order to improve the meat and fat productivity of sheep of the edilbay breed.

**Research objectives:**

- Study of productive qualities of sheep and queens used for breeding;
- phenotypic variability of the main breeding productive traits of offspring in experimental (edilbay x hissar) and control (edilbay x edilbay) groups;
- biological characteristics of the experimental and control groups of offspring;
- fertility and safety of the offspring of queens of different groups used for crossbreeding;
- selection and genetic parameters of the main economically useful traits of offspring of different genotypes;
- determination of the economic efficiency of research work.

**Substantiation of the novelty and practical significance of the results obtained.**

**Scientific novelty:**

For the first time in the conditions of the Almaty region, a scientific study was conducted to study the productive and biological qualities of offspring obtained from crossing sheep of the edilbay and hissar breeds.

**Practical significance.** When crossing ewes of the edilbay breed with rams of the hissar breed, offspring were obtained (I – experimental group) exceeding their purebred peers (II – control group) in terms of the main breeding characteristics – live weight and meat productivity. Such superiority at the age of 4 months. In terms of live weight in the group of sheep and eggs, it is 5.5 and 3.6 kg or 13.8 and 9.9%; and in eggs aged 12 and 18 months, 3.7 and 3.4 kg or 9.0 and 5.5%. According to the slaughter weight index for 4 months. The superiority of mongrel sheep (group I) compared to their peers in group II was 2.0 kg or 9.3%.

**The object of the research is** sheep and queens of the edilbai sheep breed (Almaty region, Talgar district, UPNC "Bayserke-Agro") and sheep of the hissar sheep breed (Almaty region, Research Institute of Sheep Breeding named after Mynbayeva), as well as mongrel and purebred offspring.

**Methods and methodology:** The queens of the edilbay breed used in the experiment belonged to the desirable (elite and I class), the number of which was 592 heads, with an average live weight of 68 kg and a wool cut of 2.9 kg, which exceeded the breed standard established for class I sheep by 3 kg and 4.6%, respectively. The producing sheep of the hissar breed (2 heads) had an average live weight of 125 kg and a shearing of 2.8 kg of wool, while the edilbay breed (2 heads) had 105 and 3.3 kg. The indicated productivity indicators of sheep for both breeds exceeded the breed standard for elite class sheep - 5.0; 14 kg or 4.1; 14.7%, respectively. During the artificial insemination period (October-November, 2020), 440 heads of queens were inseminated with sperm from hissar sheep (experimental group), and 152 heads from the edilbay breed (control group). During the dissertation work, in accordance with the tasks set, the phenotypic and genotypic variability of the selected traits of the offspring of different genotypes, as well as their biological characteristics (morphological and molecular genetic parameters of blood, histostructure of the skin, fertility of the queens and the safety of the offspring) were studied. DNA was isolated from the blood according to the procedure recommended by a set of DNA-Sorb-B reagents. PCR and PCR-PDRF of isolated blood serum were studied in the laboratory of Ahi Evran University, Kirsehir, Turkey. The study of the histological structure of the skin was carried out according to the methods of N.A. Diamidova, E.P. Panfilova and E.S. The results and data of the zootechnical and biochemical report were processed using Microsoft Excel software, 2010, etc. processed using biometric analysis (P.F. N.A. Plokhinsky, 1970, E.A. Merkuryeva, 1977, O.Y. Rebrova, 2002).

**The author's personal contribution** consists in setting the necessary tasks, planning and conducting experiments, statistical processing of the results obtained and their publication; participation in the development of regulatory and technical documentation.

**Provisions to be defended:**

- characteristics of the productive qualities of the sheep and queens used in the experiment;
- growth and development of the resulting offspring of different genotypes;
- meat productivity of 4-month-old sheep of different genotypes;
- wool productivity of lambs;

- biological characteristics of offspring of different genotypes;
- morphological and molecular genetic parameters of the blood of descendants of different genotypes;
- determination of the economic efficiency of research work.

**Implementation of work results in production.** The sheep producers of the edilbay sheep breed are used as valuable genetic material to increase the weight and meat and fat productivity of local coarse-haired fat-tailed sheep bred in different regions of the country. For this purpose, over the past 3 years, 4,900 heads of breeding sheep from the UPNC "Baysyerke-Agro" have been sold to farms in Almaty, Zhambyl and South Kazakhstan regions, including 700 heads in 2023 to a foreign country - the state of Qatar.

**The doctoral student's contribution to the preparation of each publication:** all the research results presented in the thesis were obtained and formulated with the direct participation of the applicant in accordance with the individual research plans of the doctoral student. The doctoral student mastered the modern methodology of animal science research, took an active part in the discussion and publication of the results obtained, the preparation and design of scientific articles for publication in domestic and foreign scientific journals.

**Publications.**

6 scientific papers have been published on the topic of the dissertation, of which 1 publication was published in a scientific journal included in the Scopus database: Brazilian Journal of Biology (Cite Score 2023 – 2.4, percentile – 59), 3 publications were in journals recommended by the Committee for Quality Assurance in Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan and 2 publications – in collections of materials of the International Forum.

**The structure and scope of the dissertation.** The dissertation work consists of 120 pages of computer text and an introduction, justification of the topic, methods and methodology of research, results of own research, conclusions, proposals for production, 157 bibliographies, including 20 sources in foreign languages and applications. The text of the dissertation contains 28 tables, 17 figures and 5 diagrams.