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ORIGIN, BIOLOGICAL PARTICULARITIES AND THE SPREADOF THE KARAKUL RACE SHEEP

Ion BUZU

Institute of Zoology of Academy Science of Moldova,
1 Academiei Street, MD-2028, Chisinau, Republic of Moldova

Corresponding author email: ionbuzua@gmail.com

Abstract

The aim of the scientific research was to highlight the origin, biological particularities and spread in the world of Karakul race sheep for better knowledge and prediction of the impact of using this race as an breeding ameliorating raceand improve the morpho-productive qualities of local races. The research was conducted based on the synthesis analysis of a number of specialized bibliographic sources, published in different periods of spread and research of the Karakul sheep race in the world. The results of the research showed that the opinions of different researchers on the origin and period of formation of the Karakul sheep race, so far, are divergent. Some researchers believe that the Karakul sheep race has ancient origins (1300 years to en) and formed in the regions of ancient Mesopotamia, others mention that it has medieval origins and was brought to Central Asia by Arabs in the VIII century, and the third group of researchers report that the true Karakul race originated in the modern period (XVI-XVIII centuries) and was formed in Central Asia by the selection of local pseudo-Karakul sheep in the direction of improving the furskin qualities of newborn lambs. The main biological particularities of Karakul sheep is that the hairy sheath of newborn lambs is wound in loops of different types (wave, bob, ridge, etc.) and shapes (tubular, rib, flattened), with various varieties of curling (jacket , costal, flat, Kaukasian, moire), consisting of elastic, silky and glossy fibers, with a wide range of colors (black, greyish, gray, brown, pink, white), shades (dark, medium, light) and coloration (blue, gold, silver, pearl, bronze, platinum, diamond, amber, steel). Due to these specific biological particularities and the demands of the excessively large market for Karakul furskins in the late 19th - early 20th century, this race was spread all over the world, being exploited either for scientific research and pure race breeding, or at the crossbreeding with some local races to improve the furskin qualities of newborn lambs and the production of commercial furskins. The Karakul sheep race has low skills in milk and meat production (low body mass), being extremely sensitive to helminth infections in conditions of high air humidity, rain and wet pastures. Sheep of this race are widespread in warm arid countries, regions and areas with low humidity, large plains, semi-deserts, poor vegetation, where they are maintained throughout the year in natural grazing conditions, without capital investment, with minimal costs. The knowledge of these biological and environmental particularities, allows the application of cautious and reasonable strategies of selection and spread of this race as an ameliorating race to the development and improvement of the morpho-productive qualities of some local races.

Key words*: biological particularities, Karakul race, origin, spread.*

INTRODUCTION

According to research conducted on the basis of FAO data (www.fao.org/docrep/012/a 1250r. Pdf, 2016) more than 1129 sheep breeds are raised in the world (Buzu, 2016). In different geographical areas of the world were created by humans, raised and spread those races of sheep that, meeting the requirements of society, corresponded more adequately to local traditions and pedo-climatic conditions.

The Karakul sheep race was created in Asia, in arid and extensive pedo-climatic conditions, which allowed the maintenance of sheep grazing throughout the year, with minimal costs. The spread and improvement of the race occurred under the influence of the growing demand of the world market for the furskin of the newborn lamb, slaughtered 1-5 days after birth. According to its value, it is considered a luxury fur. Over the centuries, the selection of Karakul sheep in the main breeding areas has been unilateral, oriented towards improving the qualities of the furskin.

Thus, in the countries of Central Asia were created several intrarasial and elite types of Karakul sheep of different colors, shades and coloration, such as Karakul of Buhara, Karakalpak, Surhandaria, Karakum, Kâzâlkum, Kazakhstan, etc. (Алимбаев, 2011; Гигинейшвили, 1976; Дъячков, 1960, 1980; Дюсегалиев, 2010а, 2010б; Кошевой, 1975;

Стояновская, 1964; Юдин, 1943; Юсупбаев, 2011; www.agriculture.uz/ru.php?/research/ detail / 133-140, 2016).

In South-West Africa (Namibia), several intrarasial types of Karakul sheep of different colors with flattened and moile loops have been created (Мостерт, 1975; Филлингер, 1975а, 1975б; Шефер, 1975).

In Ukraine (Askania Nova) a prolific type of sheep was created - the Karakul of Askania (Перегон, 1972).

In Romania, at the Research and Production Station for Raising Sheep Popăuţi, Botoşani District, a local type of Karakul de Botoşani sheep was created, with different varieties of colors and shades, with increased skills of milk production (Барта et al., 1977; Pascal et al., 2010; Pascal, 2011).

In the Republic of Moldova, sheep breeding for milk-wool-furskins is one of the oldest and most traditional branches of the livestock sector(Ильев, 1965a, 1965b).

Sheep ensure the food security of the rural population with dairy products (cheese) and meat, and the processing industry - with raw materials (furskins, furs, hides, wool). They efficiently use natural pastures and plant debris after harvesting crops. For these reasons, oviculture is an accessible and indispensable branch for the local population and of major importance for the national economy.

According to historical traditions, in the northern and central areas of the country, the natives raised the Ţuşca sheep race, with mixed production skills for milk-wool-furskins, but the qualities of the furskins obtained from newborn lambs were inferior. In order to improve their qualities, the local Ţuşca race began to be absorbed by crossbreeding by the breeding race Karakul, imported from Central Asia. Imports of Karakul sheep into Bessarabia were made periodically, from 1884 until the beginning of World War II (Buzu, 2016).

During the post-World War II period (1947-1979), imports of Karakul sheep from Central Asia were made permanently, and the local Ţuşca sheep race was practically replaced by the Karakul race through mass absorption crosses (Богданович, 1957; Богданович et al., 1979; Богданович et al., 1983; Богданович et al.,1984; Ильев, 1957a, 1957b, 1966a, 1966b, 1969, 1976, 1984; Ильев & Богданович, 1966; Ильев et al., 1981). However, improving the number of sheep for the furskins was difficult. The share of first-class furskins in the Republic did not exceed 12.0-15.0% (Бузу et al., 1992). As a result of these crosses, it was observed that the level of milk production and body mass (meat production) in sheep began to decrease (Buzu, 1995; Богданович et al., 1979), which did not correspond to the traditions of sheep farming as milk and meat producers.

It should be noted that, until 1976, breeding crosses had a mass companion character, because the standard purpose of the required animal models was not elaborated, in the selection were not taken into account the genetic parameters of the selected characters and morpho-productive biological particularities of the initial races of sheep. As a result of these crosses, a population of mixed-breed sheep (Ţ x K) of different generations was created in the Republic, which began to be unofficially called the moldavian Karakul (Богданович, 1957; Ильев, 1957a). The productivity of these sheep continues to be low, even on breeding farms. This situation persisted because there were no objective methods for assessing furskin characteristics and sheep selection in local conditions.

To date, some of the most important characteristics have not been taken into account in determining the general breeding value (class) of Karakul sheep, according to the Instructions Guidelines in force (Buzu et al., 1996), some of the most important morpho-productive characters of selection are not taken into account, such as the production of milk and meat (body mass).

In fact, the main flaw of these Instructions is that the production of furskins is considered the only basic character, expressed by the class of lamb, and body mass and milk production are not taken into account in determining the class of the animal. So, between the values of the main morpho-productive characters and the breeding value of the animal there is an obvious rupture, which requires integration in a unique complex of the phenotypic, genotypic and economic values of the animal.

Research on the economic value of selection characters (Buzu & Spătaru, 2015) has shown that given that the selling price of furskins on

domestic and foreign markets remained at the level of 30-40 years ago, and the price of food products (meat, cheese) has skyrocketed during this period, 5-10 times, raising Karakul sheep without increased milk and meat skills in the Republic of Moldova becomes unprofitable. Therefore, the elaboration of an objective and efficient methodological framework for the complex selection of Karakul sheep according to the furskin qualities of the lambs, the body mass and the milk production of the sheep, considering the biological particularities of the animals, presents a particularly important and current problem.

In this context, the knowledge and highlighting of the biological particularities of the Karakul sheep race, as well as its genealogical links (origins) with ancestors of different intrarasial types from different areas or geographical zones of the world, allows the application of careful and reasonable selection and distribution strategies of this race as an ameliorating race to the development and improvement of the morpho-productive qualities of some local races.

MATERIALS AND METHODS

The research was conducted based on the synthesis analysis of a number of specialized bibliographic sources, published in different periods of spread and research of the Karakul sheep race in the world. Among the oldest and most important bibliographic sources studied by us were the publications of famous Austrian researchers (Adametz, 1911, 1927) and Tsarist Russia (Демянко, 1912; Карпов, 1912; Иванов, 1914; Юнг, 1914a, 1914b), from which we gathered some important information on the origin, biological particularities and spread of the Karakul sheep race in the early stages.

Important information on the origin of the Karakul sheep race has been found in the original publications of German researchers in the interwar period (Hornitsehek, 1939) and after the Second World War (Hundt, 1954; Trauer, 1963; Franke, 1973).

Other bibliographic sources, no less important, were the scientific reports of representatives of academia from different countries at international symposia for the Karakul sheep race, from which we became acquainted with the situation regarding the breeding and improvement of Karakul sheep in Romania (Барта et al., 1975), Germany (Вуссов, 1975), Austria (Турек, 1975) and other countries.

Much of the research information in this paper has been gathered from the scientific materials of some outstanding German researchers (Мостерт, 1975; Нел Джеймс, 1975; Филлингер, 1975a, 1975b) from the Karakul Race Research Station in Neidam, Namibia, whose works have been generously translated from English into Russian, edited and published by the renowned university professor from ВИЖ (Всесоюзный институт животноводста, Дубровицы, СССР) Гигинейшвили (1975), in the collection of scientific papers of the profile «Каракулеводство за рубежом».

Numerous valuable information on the origin, biological particularities, breeding and amelioration of Karakul sheep, as well as their use in crossbreeding with some local sheep races, has been gathered from the numerous scientific papers of the renowned researchers of the Institute of Scientific Research in Animal Husbandry for the steppe districts „Аскания-Нова", СССР (Иванов, 1964a, 1964b; Перегон, 1972) and the Union Institute for Scientific Research for Karakulture in Samarkand (Васин, 1936, 1971; Юдин, 1943; Дъячков, 1950, 1952, 1960, 1973, 1980; Кошевой, 1975; Стояновская, 1964; Одинцова, 1958).

Scientific information on the spread, the growth, breeding and use of Karakul sheep at the crossbreeding with the local Ţurcana race was taken from the bibliographic sources of some famous researchers in Romania (Nica, 1937, 1940; Ştefănescu, 1961; Ştefănescu et al., 1973; Pop et al., 1976; Pascal, 2007, 2011; Pascal et al., 2010).

Scientific informative data on the spread and biological particularities of the Karakul sheep race in the Republic of Moldova, as well as the results obtained at their crossbreeding with local sheep from the Ţuşca race, were collected from valuable scientific papers by the remarkable university professor Iliev Tudor (1992), known in the Soviet period as Ильев (1957, 1965, 1966, 1969, 1976, 1981, 1984). Much of the necessary scientific information

was taken from the works of the former director of the Moldavian Subsidiary for Scientific Research in Karakulture, Богданович (1957, 1979, 1983, 1984), as well as from some of our later works (Бузу et al., C.A., 1992; Buzu, 1995, 1996, 2001, 2015, 2016, 2017, 2018).
The materials of all the relevant scientific information were processed and systematized, according to the scientific synthesis methodology.

RESULTS AND DISCUSSIONS

The origin. From the point of view of zoological systematics, Karakul sheep belong to the class *Mammals*, order *Ongulate*, suborder *Artiodactyle* (*Paricopitate*), group *Ruminantia* (*Ruminant*), family *Cavicornia,* subfamily *Ovidee*, genus *Ovis*, species *Ovis aries*, subspecies *Ovis arkar* (Iliev, 1992; Pop et al., 1976; Ștefănescu et al., 1973). According to Борисенко (1967), most researchers, based on the analysis of fossils found by american professor Dyurst in the excavations of the town of Anau (suburb of Ashgabat) and their similarities with sheep of contemporary races, believe that long-tailed and fat sheep races come from wild forms of the subspecies *Ovis Vignei Arkar*, existing 5000-3500 years before our era. Given that the Karakul race is part of this group of races, we can conclude that *Ovis arkar* is the wild ancestor of this race.
Regarding the time (ancient or contemporary) and the place of formation of the Karakul race, as well as the process of occurrence of loops (result of mutations, interracial crosses, selection, etc.) in the scientific community, so far, there are divergent views.
A number of researchers (Trauer, 1963; Franke, 1973; Лангле, 1964), believe that the Karakul sheep race has ancient origins and comes from sheep with coarse wool and fat tails, whose lambs had furs with rolled loop. This loop was often embossed on various stone carved objects, bas-reliefs, ceramic tiles from the regions of Mesopotamia, as well as described by the great writers, travelers and geographers of antiquity. From the lambs with such curls were obtained the furskins known as „Merlușca". Furskins of this specification were used by the ancient Persians to make specific hats and were often brought as a gift to noble masters.
The American researcher, Юнг (1914a, 1914b), who visited the Emirate of Bukhara in the late 19th century and imported Karakul sheep to North America, believes that the Karakul sheep race originated in Turkestan in the 16th-17th centuries from the crossing of local Danadar sheep (black sheep, small , with long shiny wool, small head, straight nasal profile, with small ears straight in parts, thin legs and long tail similar to that of the dog), existing until recently in this region, with Afghan white Kurdiuk sheep with fine wool. The author is of the opinion that the European races Ţuşca, Reşetilovca, Sokoliska and Malâci also come from the Donadar race.
University professor Ильев (1969, p.8) in his work "Sheep breeding in Moldova" suggested the idea that *"Moldavian sheep Ţuşca has a common origin with the Karakul race, having as hereditary basis the skills of an old race of sheep for furskins that once spread on our country, southern Ukraine, Crimea, Uzbekistan, coming from Central Asia*"
According to the research of Hornitschek (1939), sheep with coarse wool and fat tail, whose lambs have loops of different shapes, are found in Syria, Iran, Palestine, Ethiopia, Somalia. But the most accurate forms of looping have been noted in Iraqi sheep, hinting that the Karakul race originated in that country.
According to us, the author might be right, considering that in Iraq there is a fairly large city called Kirkuk, similar to the name of one of the most valuable varieties of Kirpuk furskins, according to the official ГОСТ no. 8748-70 (1970). We believe that the name of this kind of furskin comes from the respective locality in Iraq.
Onur et al. (2013) report that in the province of Aydin in Turkey, sheep of the Cine Capari breed are currently race, which according to their external forms are very similar to the contemporary Karakul race. It is possible that the origin of this local races was related to the varieties of the Karakul race from neighboring countries (Syria, Iraq, Iran).
Adametz (1927) of the Agricultural University of Vienna, believes that the mutation of the fat tail in sheep first occurred in 2000 years until enin Syria, Palestine, Mesopotamia. Later, in

mutated-tailed sheep in these regions, the mutation of the furskin curls appeared from 1500-1600 years ago. Aspects depicting the loincloths were found on the ancient bas-reliefs of northern Syria 1300 years ago with the appearance of the king of the Hivites (Syrian tribe), whose hat and coat collar were made of looped furskins, similar to those of Karakul. The author notes that the remains of sheep for the furskins were found near Baghdad, but they are of mediocre quality. According to him, Turkestan (Bukhara, Hiva, etc.) was conquered by the Arabs in 751, populating it with their nomadic tribes from Syria and Mesopotamia, who brought with them cattle and Karakul sheep.

Academician Ivanov (1964б) supports Adametz's theory that Karakul sheep were brought to Bukhara in the 8th century by Arab invaders, hence the name "araby" sheep.

Демянко (1912) considers that the homeland of Karakul sheep is Southwest Asia, especially Bukhara, Hiva, Persia and Afghanistan.

Карпов has a similar opinion (1912, p. 3), who remarked that "*the only place in the world to create this "black rose" of sheep for furskins is the Emirate of Bukhara, and the main world trade auction for this fur is the fair in Nijnii Novgorod*".

Therefore, most researchers draw conclusions that the Karakul sheep race has ancient or medieval origins and was formed in Asia Minor or Central Asia.

At the same time, some specialists in the field (Гигинейшвили, 1976; Дъячков, 1973; Одинцова, 1958) consider that the race of sheep brought by the Arabs in the 8th century was not the Karakul race itself. The process of transforming local primitive races into high-performing races is quite sustainable and does not always end with the creation of specialized races, therefore, many ancient fat-tailed races have not reached the perfect level of furskin curling qualities. The creation of domestic animal races in the past is related to the emergence of capitalism, the growth of cities, the development of industry, the expansion of sales markets, the increase of the assortment requirements, quality and quantity of fur productions.

In this context, Одинцова (1958), Егоров (1971), Дъячков (1980) and others consider that the Karakul sheep race, specialized in the production of furskins, was created in the XVII-XVIII centuries in the Karakul district of the Emirate of Bukhara. The authors argue for the creation of this race, in large part, by developing trade relations with the furskins in Tsarist Russia on the markets of Astrakhan, from where, through the Volga River, they were transported to Nizjny Novgorod.From this international fur fair, Karakul and „Merluşca" furskins were spread by skippers throughout Europe and North America, where they were used to make hats, collars and jackets with fur on the outside. Therefore, in the early stages of the fur trade, the furskins of lambs and sheep of the Karakul race were known as "Astrahani-Karakul" (Bresson, 1940).

Biological particularities. The Karakul sheep race has a number of biological particularities, one of which is paramount and refers to the unique, very beautiful fur of the newborn lamb, slaughtered 1-5 days after birth. According to its value, the Karakul furskin is considered a luxury fur, located in the same line with the noblest natural furs (rat, mink, fox). This is explained by the superior and aesthetic qualities of the curl, the excellent silkyness of the hair coating, the perfect thermal properties, as well as the durable resistance to exploitation of furskins garments.

Unlike other racess, Karakul sheep have a very rich morpho-productive polymorphism. This polymorphism refers, first of all, to the properties of the hair coat (Adametz, 1911, 1927; Васин, 1936; Васин et al., 1971; Гигинейшвили, 1976; Buzu, 2016; Pascal, 2007).

Karakul lamb furskins with loops of different types (wave, bob, ridges, rings, etc.) and shapes (tubular, rib, flattened), with various varieties of curling (jacket, rib, flat, kaukasian, moored) have a wide range of colors (black, greyish, gray, brown, pink, white), shades (dark, medium, light) and coloration (blue, gold, silver, pearl, bronze, platinum, diamond, amber, steel, etc.). The fibers of the hair coat have various properties of gloss, silkiness, elasticity, etc. The specific properties of the hair coat, together with the skin properties, together form the furskin qualities of Karakul lambs (Дъячков & Письменная, 1952;

Иванов, 1964a; Кошевой, 1975; НелДжеймс, 1975; Шеффер, 1977; Buzu, 2016).

According to the characteristics of the biological particularities of the sheep of the Karakul race, after Васин (1971), they have less developed sweat glands compared to other races, because the abundant secretion of sweat is accompanied by considerable consumption of water from the body, which the Karakul sheep rarely receives. The same consumption of water is for frequent breathing, when animals use it to cool the body. Therefore, the respiration rate in Karakul sheep is lower compared to other sheep races.

According to the data of Алексеева (1953), the blood of Karakul sheep has a lower erythrocyte content, which indicates the more rational assimilation of oxygen compared to other races.

According to Васин (1936, 1971) and Дъячков (1950, 1973, 1980), Karakul sheep are quite small and late. The body weight of ewes is 40-45 kg, of rams 50-60 kg. This body mass of sheep is reached late, at the age of 6-7 years. The gestation period of Karakul sheep is relatively long - on average 151 days, while in the Romanov race - 148 days, in the English meat races 145-147 days. As a result, the body weight of the lamb at birth is relatively high and constitutes 11-12% of the mother's mass, while in English races for meat 7-9%. These particularities were formed in the process of evolution as properties of adaptability of the organism to the conditions of the desert and semi-desert environment with conditions of arid heat and drought. When calving takes place in unstable climatic conditions, under the open sky, without shelters, well-developed lambs survive more easily. Born quite chewed, the Karakul lamb grows rapidly and at the end of the first month of life reaches a body weight of 8-10 kg. Subsequently, the growth rate decreases. The ability of Karakul lambs to grow rapidly in the first months after birth is, again, a feature of adaptability, in which the lamb rushes to increase its weight in favorable conditions of maternal nutrition in ephemeral pastures, until the unfavorable conditions of terrible drought. The external appearance of the Karakul sheep expresses its general underdevelopment. In addition to his short stature, the Karakul sheep have narrow chest and back, bevelled saddles and croup, constitutional dryness and poorly expressed meat skills.

The prolificacy of the Karakul race is not high (105-110%), because under natural conditions, twin lambs usually perish due to poor development. Hence, the birth rate is low and is 70-90% (www.fao.org/docrep/010/ah806e/AH806E13.htm//Top/OfPage, 2016). The fat tail is an obvious adaptability of the Karakul sheep, expressed by the ability of fat to accumulate in the kurdiuk which allows it to provide reserves of energy food and water for periods of famine and drought.

Ильев (1969, p. 40) mentioned that "*Karakul sheep, compared to Ţuşca, give much less milk and, as a rule, end lactation much earlier than Ţuşca*". The fact that the milk production of Karakul sheep is low and lactation is shorter (100-130 days), is confirmed by several authors, publishing data on the amount of milk of ewes per lactation, from 25-40 kg in Bukhara (Дъячков,1980), 43.3-49.3 kg in Romania (Nica, 1937, 1940; Ștefănescu, 1961), 50 kg in Germany (Hundt, 1954), 40-45 kg in Afghanistan (www.fao.org/docrep/010/ah806e/AH806E13.htm, 2015), 40-50 kg in Iran (www.fao.org/docrep/010/ah806e/AH806E13.htm, 2015), up to 55.0 kg in the Republic of Moldova (Ильев, 1966b).

Karakul sheep are very mobile and active, have robust legs, light skeleton, which allows them to travel long distances during the day and night in search of vegetation for food, efficiently using dry and very rare vegetation from the pastures of deserts and semi-deserts. as a rule, it cannot be used by other species of domestic animals (Васин et al., 1971).

At the same time, Karakul sheep are extremely sensitive, compared to other sheep races, to the conditions of rain and wet pastures, infected with helminths. In some northern countries, helminthic invasions have become an impenetrable barrier to raising Karakul sheep in new conditions (Ильев, 1966b). According to this author, after the importation of Karakul sheep in 1913 from Bukhara to Todireşti, Bender, Bessarabia and, in 1933, in Cucuruzeni, Orhei, Moldova, where they were bred in purerace, they perished for two years due to strongyloidosis and dictyocaulosis, respectively, 17 and 60% of the imported herd.

Therefore, the knowledge of the biological particularities of the sheep race, expected for breeding, reproduction and genetic amelioration, is extremely necessary both for relectors, zoo-veterinary specialists and for breeders (owners) of these animals.

Spread of the Karakul race. Due to the biological particularities of Karakul sheep (unique in the world) and the ever-increasing demand for their lamb furskins, animals of this race were exported in the late 19th and early 20th centuries, either from Turkestan or other Russian governments, in Bosnia, 1894 (Турек, 1975), Germany, 1903 (Буссов, 1967) and 1913 (Иванов, 1914), USA Texas for the property of Yung, 1908 (Иванов, 1914), Romania, 1910 (Барта et al., 1977), Austria, 1907 (Турек, 1975), Namibia, 1907 (Филлингер, 1975a). From Europe, Karakul sheep have been exported to Africa, America (USA), Argentina, Canada and other parts of the world.

The expansion of fur markets in Europe has led to an increase in demand for the quantity and quality of Karakul furskins, leading to an increase in their price value. The unpretentiousness of Karakul sheep in maintenance, the relatively low cost of exploitation, the relatively convenient prices and the ever-increasing trade in furskins, have produced a real boom in the development of this race of sheep in the Central Asian Emirates, where Karakul sheep herds have increased sharply. At the end of the 19th century and the beginning of the 20th century, the growth rate of Karakul sheep herds accelerated, due to their high demand in Europe for the reproduction of breeding material. Thus, during this period, the Karakul sheep race becomes specialized in the production of a widely consumed productively, such as the furskin of the lamb in the first days after birth (Дъячков, 1980).

The spread of Karakul race sheep in Europe, and from here in many countries around the world, is due to the advancement and propagation, by Prof. University of Harikov Zaikevici A.E., since 1880, of the idea of genetic ameliorationof local sheep with coarse wool for the furskins, by crossing with the Karakul race from Bukhara (Иванов, 1914). The effect of improving the furskin qualities of lambs obtained from these crosses was confirmed by several sheep breeders at that time (Buzu, 2001).

To achieve this idea, starting with 1882, the Ministry of Property of the State of Tsarist Russia, together with the governmental zemstvels of Poltava, Tavria and Bessarabia and with some interested private investors, carried out a series of expeditions for the purchase of Karakul sheep from Turkestan (Юнг, 1914a).

According to the account of Карпов (1912, p. 4], due to the excessive rise in prices for Karakul furskins, increased interest in this race worldwide. Thus, "*the West, which not long ago knew this race more only from rare photographs and zoos, in the last time initiates whole expeditions for the acquisition of these precious animals, studies them in the homeland, implements their breeding in new territories, establishes Karakul sheep nurseries, even in Africa and America*".

According to the communication of Иванов (1914), the first import into Bessarabia of Karakul sheep was made in 1884 from the Transkaspia region with the support of the Zemstva of the Bessarabian government and the Russian Ministry of State Property. The second import was made from Bukhara in 1888 by the Agricultural Society of Bessarabia through the Agricultural Society of Poltava. Between 1889 and 1898, with the contribution of General Krupenschii (former governor of Bessarabia), several expeditions were made to import Karakul sheep from Bukhara. Later (1902-1913), representatives from Bessarabia participated in four import expeditions of Karakul sheep from Bukhara, organized by the Agrarian Society of Poltava Government. By the 1910s, the largest buyers of imported Karakul sheep became brothers - Sinadino boyars (of Greek ethnicity), who established in the village of Oniţcani, Orhei District, a farm of 700 heads of purerace Karakul sheep. According to the same author, in the Hotin District, Karakul sheep aroused a special interest. During this period, the Karakul sheep farms of General Krupenschii M.G. were established here by import in the village of Lomacineţ - 295 chap, of the Kaufman brothers in the village of Corjeuţi - 300 chap and Feteşti

village - 200 chap, of the owner Tevanov in Târnovo village - 278 chap.
In the Bender District, Zemstva set up an Agricultural Chamber of 110 purerace Karakul sheep, which were used in a directed way to improve the Țușca sheep in the area. In smaller quantities, Karakul sheep were purchased by several owners from Chisinau, Akerman, Soroca, Balti, Orhei and others (Buzu, 2001).
As we can see from this information, in Bessarabia at that time a real "boom" started to amelioration the Țușca aboriginal sheep by crossing with the imported Karakul sheep, which contributed to the improvement of the furskins qualities, without taking into account the impact of this crossing on the other important morpho-productive characters, such as: milk production and body mass (meat production).
According to Pecuta (1938), from the Karakul flock of the "Onitcani-Synadino" farm, Bessarabia, in the 1930s, sheep were exported to the south of France, Bulgaria, Algeria and Portugal, which acclimatized. relatively well.
At present, Karakul sheep are mainly distributed in Asia, mainly in Central Asia, as well as in Africa. In the countries of these regions and continents are the largest effectives of Karakul sheep in the world (Table 1).

Table 1. Karakul sheep effective in the main countries of distribution (after Buzu, 2017)

No. ord	Name of the country	Estimated effective, thousand head
1.	Uzbekistan	11,825.1
2.	Kazakhstan	6,079.1
3.	Turkmenistan	12,600.0
4.	Tajikistan	1,006.2
5.	Afganistan	5,256.4
6.	Namibia	2,871.4
7.	Republic of South Africa	1,250.0
8.	România	706.7
9.	Republic of Moldova	350.0

By generalizing the historiography of the spread and growth of Karakul sheep in the world, based on some estimates previously made by us (Buzu, 2017), we can conclude that they have taken root in sustainable growth „in those regions, parts and continents of the world with countries poorly developed (from Africa, Asia), with large rural human populations, living in arid areas of vast plains, semi-deserts with poor vegetation, where sheep are kept year-round in natural conditions without capital investment, with minimal costs".
For these human populations, sheep are an indispensable source of existence and survival in the difficult conditions of nature.
Due to special biological features (superior furskin qualities of newborn lambs), Karakul sheep have aroused curious interest around the world, spreading in small effectives on continents other than Asia and Africa.
Thus, in Western European countries (Austria, Germany, France etc.), as well as in South America (Argentina) and North America (USA), Karakul sheep have been imported for the purposes of scientific research and cross-breeding experiments with some races of local sheep. In some European countries (Austria, Germany), Karakul sheep have started to be bred (albeit in small effectives) for the purposes of purerace breeding and export marketing (South Africa, Namibia) of young.
Due to low meat and milk skills, as well as highly preserved specific heredity, the use of the Karakul race at the crossbreeding with local sheep races has had a negative impact on these morpho-productive traits. For example, in the Republic of Moldova, mass crossbreeding of local ewes (Ț x K) with Asian Karakul rams has led to some improvement in the furskin qualities of lambs and, at the same time, to a decrease in sheep's resistance to environmental weather, a significant decrease in viability, body mass and milk production (Buzu, 2018).
Due to the very specific biological particularities, the sustainable spread of the Karakul sheep race, unique in the world, was successful only in some regions and areas, which according to the pedo-climatic specificity corresponded more adequately to the physiological requirements of the animal organism and maintenance and exploitation conditions theirs.

CONCLUSIONS

The views of various researchers on the origin and formation of the Karakul sheep race have so far differed. Some researchers (Trauer, 1963; Franke, 1973; Лангле, 1964; Hornitsehek, 1939), consider that the Karakul sheep race has ancient origins (1300 years) and

formed them in the regions of the former Mesopotamians, others (Adametz, 1927) mention that it has medieval origins and was brought to Central Asia by the Arabs in the VIII century, and the third group of researchers (Юнг, 1914; Одинцова, 1958; Дъячков, 1980; Егоров et al., 1971) relates that the true Karakul race originated in the modern period (XVI-XVIII centuries) and was formed in Central Asia (Ashgabat, Bukhara regions) by selecting local pseudo-Karakul sheep in the direction of improving to perfection the furskin qualities of newborn lambs.

The main biological particularities of Karakul sheep is that the hairy shell of newborn lambs is wound in loops of different types (wave, bob, ridge, etc.) and shapes (tubular, rib, flattened), with various varieties of curling. (jacket, bag, flat, kaukasian, moire), consisting of elastic, silky and glossy fibers, with a wide range of colors (black, greyish, gray, brown, pink, white), shades (closed, medium, light) and coloration (blue, gold, silver, geml, pearl, bronze, platinum, diamond, amber, steel, etc). Due to this biological particularityes and the excessively high market requirements for the furskins of newborn lambs, the Karakul sheep race has been spread all over the world, being exploited for the purposes of scientific research and purerace breeding, or by crossing with some local races for amelioration furskin qualities of newborn lambs and the production of commercial furskins.

Karakul sheep have low skills in milk and meat production (low body mass), being extremely susceptible to helminth infections in conditions of high air humidity, rain and wet pastures.

Karakul sheep are widespread in warm arid countries, regions and areas with low humidity, wide plains, semi-deserts, poor vegetation, where they are maintained all year round in natural grazing conditions without capital investment, with minimal costs.

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