

OVCHEPOLIAN SHEEP - BRED IN MACEDONIA

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Abstract

One of the three local breeds of sheep that is bred and is under the protection in Macedonia is the Ovchepolian sheep. The interest of breeders over the past years is stable, and the number of heads bred from this breed is increasing. The aim of this research was to give a picture of the breed itself, some productive features and its importance.

The data presented in this paper are obtained as a result of field research within the program for protection of biodiversity in our country over several years. They are part of the reports of the Macedonia Ministry of Agriculture, Forestry and Water Economy. The average weight of rams is up to 45 kg and of ewes is up to 35 kg. The color of its hair is often white, sometimes mixture of white and black, and sometimes they are completely black. Rams have well-developed and large horns, while sheep do not have horns or they have significantly smaller horns. The average lactation length in this sheep was 6 months, the average milk lactation was 50 - 60 liters and the average daily amount of milk was 0.3 liters. The percentage of fertility was 100 - 110%. Macedonia ratified the Convention on Biological Diversity in 1997, and in 2004 adopted the first National Biodiversity Strategy with an action plan. Since then has been started with an effective protection to stop the loss of biodiversity. In sheep breeding, the only domestic breed that will be protected is the Ovchepolian sheep. After the determination of the farms during 2003, from 2013 until today, this breed is continuously monitored and financially supported by the state. The financial support is 9 euros/per head yearly. The annual monitoring includes 26 - 30 farms, with about 8,000 heads of all categories, but new herds are also explored, where it is determined whether they meet the criteria for financial support. Because the Ovchepolian sheep is characterized by low productivity that directly affects the financial stability of stock raiser, endowment of the same is of particular importance. At the same time, it makes a significant contribution to the conservation of

biodiversity in our country. Until the number of heads increases from 9,999, when the breed will no longer be valued as endangered, intensive activity is needed in its maintenance and appreciation.

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Key words: *Ovchepolian sheep, Biodiversity, Production, Macedonia.*

1. Introduction

The breeding of sheeps' in the Republic of Macedonia is characterized by tradition and this branch of stockbreeding enables proper and full use of the natural resources available to the country. Shepherd production is mostly based on extensive breeding technologies, use of natural pastures and management in areas with difficult production conditions in rural areas. Attempts to intensify, through the importation of highly productive breeds (primarily dairy), have not enabled the development and promotion of the sector so far, primarily due to the poor acclimatization of the imported breeds, as well as due to the failure to provide adequate conditions for breeding [11].

Unfortunately, as a result of all these problems, from a country where 60 years ago about 2,000,000 sheep were bred and an annual income of more than 91.77 million euros was realized from the export of lamb meat, today in Republic of Macedonia about 600,000 sheep are bred, which generate an annual foreign exchange inflow of about 10 million euros [16].

Shepherding enables the production of several shepherding products (milk, meat, leather, wool, tallow, fur, and animal waste), but milk and lamb are the main products that provide the largest percentage of total income in shepherding. The milk is processed into several dairy products (white brine cheese, cottage cheese, yellow cheese, sour milk, etc.), which are mostly sold on the domestic market, while lamb meat is exported to several countries in Europe and the region (Italy, Greece, Croatia, Serbia, Bulgaria, Bosnia and Herzegovina, etc.) and is a unique traditional Macedonian shepherd product, recognizable on the mentioned markets.

The aim of this research was to give a picture of the breed itself, some productive features and its importance.

2. Ovchepolian sheep - Macedonian breed

2.1 Types of sheep breeds

In the Republic of Macedonia in 2021, 633,281 sheep of all categories were bred [16]. Over the past 30 years, a significant decline in the number of sheep has been noted, which is the cause of several factors. (depopulation of the villages, insufficient modernization of sheep production as a whole, weak accumulation, low profitability, etc.). Fluctuations in the number of sheep in Republic of Macedonia by categories, in the period 1990 - 2021 is shown in Table 1.

Table 1. The number of sheep in Republic of Macedonia in the period 1990 - 2021, by categories

Year	Categories			Total
	Ewes for breeding	Lambs and weanlings	Rams and barren ewes	
1990	1,612,527	522,507	162,081	2,297,115
2000	887 057	290,051	73,578	1,250,686
2010	568 301	180,173	29,930	778,404
2020	476 914	119,518	34,202	630,634
2021	489 579	108,756	34,946	633,281

Source: SSO (State Statistical Office) [16].

For the last 50 years, most of the sheep farms in Macedonia are owned by individual agricultural holdings, and a very small part of the sheep are bred by legal entities. In 1995, the ratio of natural persons-legal entities was 90 : 10%, so in 2019 it is 98.46 : 1.54% [10].

According to data from the Unit for Identification and Marking of Domestic Animals, at the Agency for Food and Veterinary Medicine, 14 genotypes of sheep have been registered, namely: Ovchepolian, Sharplanian, Karakachanian, Würtemberg, Wurtemberg

crossbreeds, Avasi, Avasi crossbreeds, Assaf, East Frisian, crossbreeds East Frisian, crossbreeds Sardinian, Romanov, Pleven and crossbreeds. The percentage share of each genotype in the total number of sheep from 2018 is shown in the Table 2.

Table 2. Number and percent of each sheep genotype in RM (2018)

No	Breed	%	Number
1.	Ovchepolian	26.98	196.142
2.	Sharplanian	26.42	192.071
3.	Cross-breeds (Undefined)	19.40	141.036
4.	Merinolandschaf cross-breeds	12.59	91.528
5.	Merinolandschaf	9.95	72.336
6.	Awassi cross-breeds	2.82	20.501
7.	Romanov sheep	0.88	6398
8.	Asaf	0.50	3635
9.	Awassi	0.30	2181
10.	East-Friesian	0.07	509
11.	Karakachanian	0.06	430
12.	East-Friesian cross-breeds	0.03	210
13.	Black head Pleven sheep	0.01	73
14.	Sardinian cross-breeds	0.00	0
Total		726.990	

Source: Macedonian Food and Veterinary Agency [3].

According to the data presented in Table 2, the most represented breeds of sheep in the country are the local breeds, Ovchepolian (26.98%) and Sharplanian (26.42%).

The Ovchepolian sheep breed is the only breed that is actively protected by the country. The interest of breeders during the past years has been stable, and the number of heads bred from this breed is on a slight increase.

2.2 Breed origin

The Ovchepolian sheep belongs to the Pramenka breed, which as an indigenous population of sheep evolved on the territory of Ovche Pole. According to the research and results obtained by Tashkovski [17], today's Ovchepolska sheep was created by crossing long-tailed and short-tailed sheep in the past.

2.3 Ovchepolian sheep physical characteristics

The Ovchepolian sheep is of medium size, while according to the length of the tail, it belongs to the group of long-tailed sheep. The color of the fleece is usually white, but rarely there are samples that are completely black or brown or reddish in colour.

The main characteristic of Ovchepolian sheep is the colouring of the head. The head pigmentation can

be complete or partial and is always black or dark in colour. When pigmentation starts from the ear shells and of the base of the horns and then descends along the side of the head to the mouth and a white line appears in the middle of the head (from the forehead, through the nose to the part between the jaws), it is a type called Lisa (Figure 1).



Figure 1. A ram from the Ovchepolian type - Lisa

Herds that have completely black or dark pigmentation on the head are called Karabasha (Figure 2).



Figure 2. Sheep of Ovchepolian type - Karabasha

This breed of sheep is most recognizable by the typical pigmentation around the eyes (Figure 3).

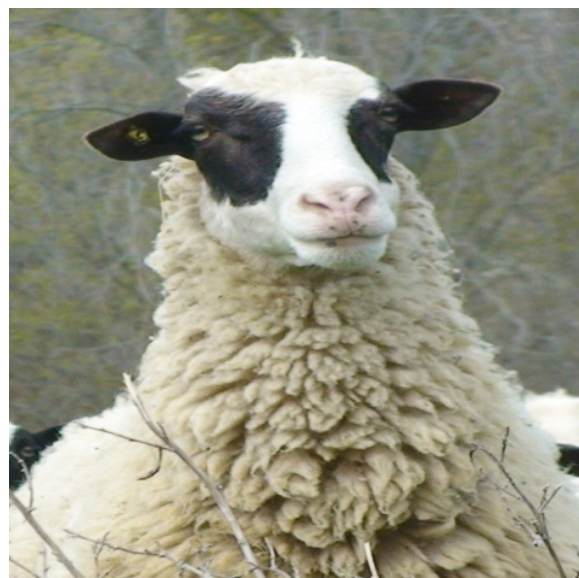


Figure 3. Sheep with typical pigmentation around its eyes

The mouth of the Ovchepolian sheep is always darkly pigmented, while the ears are mostly black over the entire surface. Sometimes there are unpigmented parts of the ears, but the tops are always pigmented.

Rams have well-developed and large horns with different positions, while sheep are usually either hornless or with small horns. It often happens that during the first shearing of the lambs, the horns are removed [12].

The tail of Ovchepolian sheep is symmetrically thin and of medium length, usually above the hock. The hoofs are almost always black or dark, firm and small to medium in size [17]. Ovchepolian sheep weighs 30 - 40 kg on average for sheep and 40 - 80 kg for rams.

2.4 Productive traits

According to research by number of authors ([8, 17, 19, 20, 21]) the average length of lactation is 180 days. According to Tashkovski *et al.*, [18], the average length of lactation is 161 days and it is similar to the length of lactation in other Pramenka (Table 3).

During the lactation period according to Tashkovski [17], the Ovchepolian sheep produces an average of 72.5 liters of milk, with variations from 38.7 to 91.3 liters. According to research by Pacinovski *et al.*, [8], for a lactation period of 180 days, the total milk produced is 53 L (of which 23 liters are expressed milk, and 30 liters are skim milk, that is, commercial milk). Kozarovsk [4], determined a similar amount of milk in traditionally and intensively reared sheep of the Ovchepolian breed, which was 28.35 L for the traditionally reared sheep, and 34 L for the intensively reared sheep (Table 3).

Table 3. Some production characteristics of the Ovchepolian sheep

Authors	Lactation (days)	Total production of milk per lactation (L)	Length of suckling period (days)	Twin births %	Sterility %
Tashkovski, [17]	180	72.5 (min. 38.7 max. 91.3)		5 - 6	5
Tashkovski, [18]	161				
Tokovski et al., [21]	180				
Tokovski et al., [20]	180				
Kozarovski et al., [4]		34			
Kozarovski et al., [4]		28.35			
Shokarovski et al., [15]			60 - 75		
Todorovski et al., [19]	180				
Pacinovski et al., [8]	180	53			
CBPLB 2011-2020, [2]	191				

Lactation milk yield in Ovchepolian sheep is significantly lower than that found in some indigenous breeds of sheep in the Balkans: 100 kg in Lipe sheep in Serbia, 120 kg in Istrian sheep in Croatia, 90 - 120 kg in Dubian sheep in Bosnia and Herzegovina, 100 - 110 kg in Pivska sheep in Montenegro, and 90 - 130 kg in Rechka sheep in Albania [13].

The length of the suckling period as a production stage in sheep breeding depends on many factors. Mainly it is the breeder's decision, on the basis of the: farming system used, breed, intended use of the lambs (replacement, for meat), etc. Normally, breeding lambs have a longer suckling period than lambs for producing lamb meat. This period is intended to be shorter in the intensive production system in order to increase the profitability of the farm. In any case, this is a very important factor on which the production of milked milk and the growth of the lambs depend. An already proven technology for early-weaned lambs, according to which the amount of suckled milk could be reduced to a minimum and the amount of milked milk to a maximum, was not accepted by sheep breeders in Macedonia and required hiring an additional labor force. Generally, the length of the suckling period according to the traditional technology used in Macedonia is, on average, 2 to 2.5 months, and this technology is used by many sheep breeders in the country [15].

The largest part (more than 95%) of the Ovchepolian sheep in the country are milked. At the same time, part of the farmers sell the milk to dairies, while another part is processed in their own processing facilities (small dairies, etc.) mostly into hard dairy products (cheeses). The most common product is the white soft brine cheese, while a small part of the milk is used to produce the so-called zolto sirenje (yellow cheese). The sheep cheese market is characterized by continuous demand and placement. Apart from cheese, milk is

also processed into cottage cheese and fermented products (yogurt and sour milk).

The purchase price for 1 liter of sheep's milk ranges from 33.18 denars (0.54 euros) in 2014 to 39 denars (0.63 euros) for 1 liter of sheep's milk and there is a continuous increase in the mentioned period [1]. Often, farmers and their associations react that the price is still quite low and does not allow sustainability and development of the farms. The selling price of white brine cheese ranges from 300 to 500 denars (5 to 8 euros), depending on the quality and the region where it comes from (Porchu and Dzabirski, [14]), while the selling price of sheep's yellow cheese in the Republic of Macedonia is also different and ranges from 600 to 1,200 denars/kg) (10 - 20 euros/kg).

2.5 Methods of breeding and reproduction

Regarding the method of breeding and reproduction, the majority of sheep breeders in the Republic of Macedonia usually apply traditional breeding and the experiences of the past.

The mating of the sheep's usually starts at the end of August and lasts until November at the latest, when the rams graze together with the ewes. Part of the farmers apply a planned head allowance in order to enable lambing in a shorter period of time, but also an even lamb for sale. The first allowance of the heads of the Ovchepolian sheep is at the age of one and a half year. Although it is late, the Ovchepolian sheep at that age is not yet anatomically mature, but with proper nutrition and care, normal lambing is possible and the negative impact on its normal growth and development is reduced.

Sheep from Ovchepolian sheep are used for breeding for a period of 6 - 7 years, that is, until the fifth or sixth lambing. Rams are also used in that period of life, but for

reproduction, rams aged 3 to 4 years are most desirable. It is common practice for lambs to suckle all of their milk by mid or late April when they are traditionally sold for the Easter and the First May holidays. From that period, the milking of the sheep begins.

Fertility of Ovchepolian sheep is stable and the barrenness percentage is less than 5%. However, the percentage of twinning is low and amounts to 5 - 6% [17].

The average birth weight of male and female lambs from Ovchepolian sheep, as well as the growth at the age of 30, 60, 90 and 120 days are presented in Figure 4.

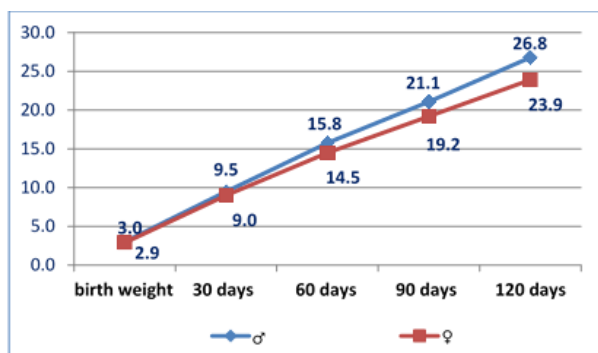


Figure 4. Growth of lambs from Ovchepolian sheep (kg)

In research on the meat chemical composition obtained from Ovchepolian sheep, Pacinovski [7], determined that it contains water (75.46%), proteins (21.81%), fats (1.41%) and mineral substances (1.07%).

The wool yield of the rams/sheep is 1.75/1.22 kg, with a fineness of about 33 mm [2].

Sheep are very mobile and resistant to low temperatures. That is why it is grown in locations where productive breeds cannot be grown. In most of the farms where the Ovchepolian breed is grown,

a barn-pasture system of breeding is applied, which implies the use of the available vegetation during 7 - 8 months with intensive grazing. During the winter period (November-February) the sheep are bred in a barn and on a pasture (when the weather conditions allow) and they are additionally fed with hay and concentrated mixtures.

Macedonia ratified the Convention on Biological Diversity in 1997, and in 2004 it adopted the first National Biodiversity Strategy with an action plan. Since then, 4 more National Strategies have been developed, which started with effective protection in order to stop the loss of biological diversity. In sheep farming, the Ovchepolian sheep is the only active breed that will be protected. After determining the breeding grounds in 2003, from 2013 until today, this breed is continuously monitored and financially supported by the country. The financial support amounts to 550 denars/head/year (8.93 euros/head/year). In the annual monitoring, 26 - 30 farms are included, with about 8,000 heads of all categories, but new herds are also investigated, where it is determined whether they meet the criteria for financial support.

The financial support of sheep farming in the country mainly takes place through two programs: the Program for Financial Support in Agriculture and the Program for Financial Support of Rural Development. The measures that have been used to subsidise sheep farming for several years, through the two mentioned programs, are presented in the Table 4.

Most of the sheep farms in the country use the first two measures. Theoretically, farms that can use all these measures should have sheep from indigenous populations, and at the same time be certified as organic farms. In that case, the financial support per head of sheep reaches 50 euros per head of sheep, which creates conditions for profitable and sustainable operation.

Table 4. Kinds and amounts of financial support to the sheep-breeding sector from the both programmes (programmes from the year 2021)

Measure (kind of support)	Financial support programme	Rural development programme
Direct payments for a marked head of sheep from all the categories	17 euro/head	/
Additional direct payments for a female lamb kept	11 euro/lamb (in first year)	/
Additional payments for a sheep head of the autochthonous Pramenka (Ovchepolian, Sharplaninian and Karakachanian)	/	9 euro/head
Direct payments for produced and sold sheep's milk	0.07 euro/L	/
Aid for preservation of the rural areas and their traditional characteristics	/	Annual salary for works in sheep farming
Organic sheep production	/	+ 30% of the support for a marked head

Source: MAFWE [4].

3. Conclusions

- The Ovchepolian sheep is the only actively protected breed of sheep in the Republic of Macedonia.
- During an average length of lactation of 180 days, it produces about 53 - 60 liters of milk (33 - 40 liters skim milk and 20 liters suckled by the lambs).
- The fertility of Ovchepolian sheep is stable and the barrenness percentage is less than 5%. The percentage of twinning is low and amounts to 5 - 6%.
- It is bred mostly in a traditional way using a stable-pasture system.
- The total number of heads of this sheep that are bred is slightly increasing, although the farmers are facing problems in the branch (depopulation and lack of labor, continuous increase in production costs, poor use of new breeding technologies, etc.).
- Financial support for breeders should continue and be continuously increased, because of sustainability and profitability of the farms (in some countries it amounts to about 100 EU/head).

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