

## THE POSSIBILITIES OF ORGANIC SHEEP AND GOAT PRODUCTION IN SERBIA

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### ABSTRACT

Basic principles that inform organic livestock production are reviewed in this paper, with special emphasis on sheep and goat organic farming in Serbia and provide guidance for development in the future. It also discusses the challenges of the modern age that may affect the viability of sheep and goat production. Today in Serbia grow less than 1.5 million sheep. In terms of breed structures, most of the population makes indigenous Pramenka sheep (80%), while the remaining 20% are: Tsigai, Merinolandschaf, Ile de France, Pirot improved, and other less important populations, as well as the crossbreeds with foreign and local domestic sheep. The most popular goat breeds are: balkan goat, domestic white as autochthonous breeds, as well as the Sanental, Alpen and Toggenburg breeds. Genetic improvement is significantly increased level of production of all species of domestic animals. However, native animals selected for high and efficient production are exposed to greater risk. This primarily refers to the physiological and immunological problems, but would generally be said that all this leads to distortion of harmony between the organism and the environment and the repercussions on the molecular level. Sustainable development of sheep and goat breeding in Serbia must be kept in mind. Possibilities for further development of organic sheep and goat production are great, and it can be expected that it will increase in the future and can become a significant branch of livestock production.

**Keywords:** sheep, goat, organic farming, autochthonous breeds

### INTRODUCTION

Organic livestock farming needs a balance between ecology and economy. Organic husbandry like ecological sheep and goat production are a new possibility for livestock production in Serbia (KÖNYVES ET AL., 2013). Marketing of produced animal originated products became more popular, and it is organized by farmers themselves or by their associations (BENNETH, 1996; BADERTSCHER-FAWAT ET AL., 1998.) First organic production in Serbia has started in the late 70's. For the last ten years, production and processing of organic products became more popular and economically more important (PETROVIC ET AL., 2011). Serbia does not have central database system and is hard to give precise figures about the size of organic production. According to the official data from the certified agents, organic production is currently conducted on around 1,200 ha. But, according to the unofficial data from the agents that are not certified by the Ministry of Agriculture, organic production in Serbia is currently conducted on much larger area of about 5,000 ha; while additional 9,000 ha of land is still in the period of transition towards organic production. That makes a total organic production of some 14,000 ha or only 0.3% of the total arable land of 4.2 million ha that is available in Serbia (GRDOVIC ET AL., 2011). The total number of registered organic farmers in Serbia is 218. Organic development in Serbia is driven by export. The "rule of 30%" in organic production means that farm animals kept in organic system must ingest at least 30% of meal dry matter from pastures, makes forage quality of highest importance. Serbia has a potential for growth of this sector,

but mainly in rural areas where conventional production is not possible or sources of pollution are not nearby.

Sheep and goat breeding is an important area of the economy, because this turnout get valued products, even those using the natural resources where human feet rarely goes down. Integrating sheep and goat into a farming operation can contribute to the economic and environmental sustainability of the whole farm (WELLS ET AL., 2000; MASON, 2003). The relatively small investment required, and the gradually increasing size of the flock, make sheep and goat production a good choice for the beginning small-scale or part-time farmer for the established farmer seeking to diversify, sheep offer a number of benefits. Sustainable sheep and goat farming is a way to get high quality meat, milk and wool, while preserving the environment, respect for labor and welfare in order to achieve economic gains and increased social status of farmers for sustainable production in today's conditions, it is necessary to know a number of biological, technological, organizational and market factors (PETROVIC, 2007). If farmers want to increase their production and profit, they need to apply modern methods of selection. For success in sustainable animal production many factors have an impact: effectiveness of controls and recording production characteristics, evaluation of genetic parameters and value of animals and organization of the diffusion of genetic material.

Sheep and goat are a significant sector of livestock production in Serbia especially in the mountainous area, which has significant natural resources (PETROVIC ET AL., 2010). Out of 826,834 ha of grassland and 601,152 ha meadow in Serbia, about 86% are located in mountain area where is about 50% of the rural population. The aim of this paper is to review the status of sheep and goat production in Serbia and point to the possibility of sustainable development in the future.

### **THE IMPORTANCE OF AUTOCHTHONOUS BREEDS IN ORGANIC LIVESTOCK MANAGEMENT**

Most recently, autochthonous breeds have been recognized as important elements to regional agro-biodiversity and, more specifically, in their relevance to agro-ecosystems that encompass the cultural heritage of a given region. By recognizing that locally adapted animal breeds have gained genetic resistance and adaptability through the evolutionary process, breeding strategies in sustainable and organic farming practices today are far more attuned to the necessity for preserving and utilizing these autochthonous breeds. Locally adapted breeds can promote sustainable development, reduce production costs, and prevent genetic pollution of a region's biodiversity. The significance of autochthonous breeds is especially stressed in the production of organic meat. To this point, advertising campaigns regularly deliver messages that highlight autochthonous, indigenous breeds, which is not only scientifically accurate from the aspect of environmental adaptation, but most importantly, builds consumer confidence in domestic products.

### **ORGANIC GOAT PRODUCTION**

Present status of Serbian organic goat breeding is not favourable since the number of goats used in the production of milk and meat is relatively low and sufficient only for meeting the demand on the domestic market. The negative trend in the number of goats has been present for over three decades and it is anticipated that it will continue in the future. The situation is considerably aggravated by the large number of non-commercial

holdings/households with mainly older population, without any modern equipment, lack of motivation for this production, where it is difficult or impossible to organize high quality production, or make long term production plans. Organic goat production is mainly present in hilly-mountainous regions, less economically developed areas with modest or poor food sources. There is difference in the number of goats reared in different regions, starting from areas where they are very rare, to those where they are considerably more numerous. They are reared mainly by poor households from passive regions or those without sufficient food for cows, to use goats as animal of very modest requirements to produce valuable foodstuff to satisfy their needs (*Table 1*). Interest of individual holdings/farms for goat rearing is constantly increasing. Goats are reared mainly on individual agricultural households, usually 1 to 2 animals, although in the field there are breeders with 20, 30, 50 and more goats in rearing.

In regard to the breed structure, the least represented are goats of Alpine breed – approx. 2-3%, White Serbian goat - 15%, different types of crosses – approx. 35% same as goats of low land Balkan type and approx. 12% of high land Balkan type. Based on results of scientific studies on goat rearing – phenotypic and production data, generally, in Republic of Serbia (ZUJOVIĆ ET AL., 1983, 1984, 2000, 2001, 2002; MEMISI, 2000) most goats represent a product of various mutual crossing of Balkan goat of low and high land type, as well as their crossing with different types of crosses with Saanen breed. Domestic white goats, especially short haired animals, are different types of crosses of Domestic White goat and Saanen goat, i.e. increase of their number in certain way caused increase of number of dairy goats on account of Domestic Balkan goats. In the organic goat milk production the mentioned native breeds are most rife.

**Table 1. Average values for productivity of goats according to genotypes in 2010 on individual farms**

Genotype	Body mass of adult animals (kg)	Fertility (%)	Lactation (days)	Milk (kg)	Average Daily Yield of Milk (kg)	Body mass of kids (kg)		
						At birth	At 30 days	At weaning
Alpine goat	49.92	1.60	215	465	2.16	2.85	8.88	18.58
Serbian White goat	46.22	1.57	212	370	1.74	2.63	6.38	13.43
Balkan goat	43.39	1.35	209	187	0.89	2.38	6.60	13.42

### ORGANIC SHEEP PRODUCTION

Over 90% of the sheep in Serbia is concentrated in small breeders, with the variable structure and size of the herd. In the last twenty years we have seen a change in the numbers of sheep, as *Table 2* shows.

**Table 2. The number of sheep in Serbia (1000 individuals)**

Year	1990	2000	2005	2006	2007	2008	2010	2012
Number of sheep	2.127	1.611	1.576	1.556	1.606	1.605	1.475	1.729
Index	100	76	74	73	75	75	69	81

From the above table we can see that the number of sheep in the past two decades fell by about 30%. The greatest reduction in the number of sheep registered in the nineties. After

stabilization, a large decrease in the number of sheep was followed by the year 2010 and by 6% compared to the year 2008. Thus, today in Serbia grow less than 1.5 million sheep. In terms of breed structures, most of the population makes indigenous Pramenka sheep (80%), while the remaining 20% are: Tsigai, Merinolandschaf, Ile de France, Pirot improved and other less important populations, as well as the crossbreeds with foreign and domestic sheep. In Serbia sheep production, for the last few decades, there have been certain changes in the system of breeding. The conditions of keeping, feeding and care improved. There were also foreign breeds imported, and some of them adapted to new conditions, and they are grown in pure breed. Genetic improvement of sheep in Serbia is carried out in accordance with the breeding program. This program covers the most important breed of sheep that are of national interest. The most important average production parameters of the population covered by the breeding program are given in Table 3.

**Table 3. Average (LSM±SE) values and production traits of sheep breeds in Serbia (PETROVIC ET AL., 2010)**

Breed of sheep	Fertility (%)	Body weight of lamb (kg)			Weight of adult animal (kg)	Yield of wool (kg)
		1. day	30. day	90. day		
Merinolandschaf	118	3.83±0.13	12.89±0.34	28.78±0.99	57.13±2.41	3.31±0.05
Pirot improved	127	3.17±0.10	11.86±0.40	24.22±1.01	59.13±2.86	2.58±0.07
Ile de France	132	4.61±0.16	14.94±0.33	33.96±0.90	69.57±2.99	3.87±0.06
Sjenica Pramenka	129	3.09±0.09	11.82±0.42	21.16±0.95	57.98±2.11	2.32±0.04
Svrljiska Pramenka	133	3.38±0.11	10.56±0.31	26.66±0.98	54.53±2.13	2.82±0.09
Lipska Pramenka	127	3.90±0.14	13.61±0.38	28.57±0.96	62.48±2.27	3.51±0.06
Krivovirska pramenka	140	3.36±0.10	8.70±0.28	20.70±1.03	54.80±2.17	2.33±0.03

### CHALLENGES AND RISKS IN SUSTAINABLE SHEEP PRODUCTION

New challenges facing the sheep breeding of Serbia, stems from a political orientation toward membership in the European Union (PETROVIC, 2005). New conditions for agriculture of the Republic of Serbia shall be established and reflected in the transition from centrally planned economies, where the greatest responsibility on the state apparatus, to a market where the center of the responsibility of the individual. The new integration processes (the WTO and the EU) will further change the economic conditions that will be reflected in the liberalization of agriculture, and therefore require even greater competitiveness. Increasing competitiveness is reflected in rising living standards over time and it can increase investment both in equipment and new technologies and investments in knowledge. This implies that the sheep breeding, the structure of farms, quality standards, marketing, education and training must be improved. Only by increasing the competitiveness of farmers from the Republic of Serbia can survive and thrive in the highly competitive EU internal market.

Sustainable access to sheep production in Serbia and agriculture in general, seeks to strengthen family farms, protect and exploit natural resources. This can provide a good farmers' profit, improve the efficiency of the genetic potential of sheep and perform the restoration of natural and economic resources for future generations. With these goals in

mind, the sustainable production of cheap food for sheep, controlled grazing, integrated management of diseases are necessary steps in this way. Many small farmers that are dominant in Serbia need to increase economical viability and find alternative marketing strategies, including the fostering of local or regional markets. Based on the fact that Serbia has about 1.5 million sheep and preserved natural environment, there are preconditions for successful development of sustainable sheep and avoid the risks of such negative effects of modern technology.

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