STUDY ON THE EVOLUTION OF SHEEP FLOCKS FROM THE MIERSIGULUI PLAIN

Florin Constantin POPA[1#], Radu Petru BREJEA[1],

[1] University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea; Romania

RESEARCH ARTICLE

Abstract

Sheep breeding is a domain that allowed Romania to be between the first countries in Europe in this area of animal husbandry. The North-West area of Romania (which includes the Miersigului Plain) has the potential to allow development and breeding of sheep. A better use of the environmental conditions and a proper use of the pedoclimatic circumstances can be favorable to permit a higher number of animals/ land unit. Tinca, Husasău de Tinca and Gurbediu reached over 5000 head of sheep/year, in 2021.

Keywords: (max. 5) fertilization, meadow, exploitation, grass, heads
#Corresponding author: Florin Constantin POPA

INTRODUCTION

The evolution of the socio-political-economic environment has left its mark on all sectors of Romanian agriculture, causing significant changes in the sheep breeding sector as well. Thus, after 1990, the dynamics of sheep flocks, along with the change in their growth paths, were the main factors that contributed to the current situation existing in Romanian oviculture. The importance of raising sheep is also given by the value of the productions that can be derived from this species. Each of the products (milk, meat, wool, skins, furs) have a great biological and economic value, even if the interest in some of them is low. Interest in milk and meat production is high, with sheep farmers having a privileged position because the market demands the products, their sale bringing substantial income.

Romania had a livestock of almost 12 million sheep and goats in 2019, similar to Greece, but the density of animals per hundred hectares was three times lower in Romania. In 2019, about 3 million sheep were exported, the volume of live sheep exports was over 1 million tons and amounted to 230 million euros.

While pig and cattle herds in Romania have been decreasing in the last decade, sheep and goat herds have increased, and in 2019 we reached a number of almost 12 million sheep and goats, an increase of 42 % compared to 2006, the year before the accession to the European Union, shows the data from the INS.

Last year, Romania ranked 3rd in the EU for sheep and goat breeding, the only countries with larger herds being England (22 million heads) and Spain (18 million heads), according to the cited source. However, the density of sheep and goats per hundred hectares is only 90 heads of animals, which shows that the yield is low compared to other European countries, Romania being in 14th place in the EU. For example, Greece, a country with a sheep and goat herd similar to Romania's, has 295 heads/100 ha, three times more than Romania.

MATERIAL AND METHOD

The Miersig Plain occupies an area of 21496.6 ha, in the localities: Livada de Bihor, Gepiu, Sănmartin, Nojorid, Leș, Chișirid, Apateu, Gepiu, Păușa, Bicaci, Miersig, Ianoșde, Husăsău de Tinca, Căușad, Gurbediu, Tinca. The types of soil encountered are: luvosols, which have the widest spread, with 9211.1 ha, followed by faeozoum with 4639.4 ha, stagnosols 3304.6 ha, preluvosols 2339.9 ha, eutricambosols 934.7 ha, alluviosols 885 ,9 ha, gleosols 162.8 ha. The waters occupy an area of 18.2 ha.

The livestock load on a meadow is a useful tool for the farmer to use because it allows him to adjust the livestock load according to the amount of grass available. To establish the correct load, the grazing capacity is calculated, respectively the number of animals that can graze per surface unit.

The grazing capacity and the optimal load of animals per hectare are calculated, for each individual meadow, according to the methodology provided in ORDER no. 544 of June 21, 2013.

According to specialized literature and Order 544/2013, art. 8 (1) the grazing capacity is estimated based on the average production of green mass obtained in previous years, considering soil fertility, meteorological conditions and the floristic composition of the vegetal carpet; and art. 8 (2) provides that the number of animals (UVM/ha) must be sufficient to ensure the maximum use of green mass production, while maintaining the long-term sustainability of the meadow.

Grazing capacity or animal load, according to Order 544/2013, art. 10, is defined by the number of animals (expressed in UVM cattle units) that can be fed for the entire grazing season from 1 ha of meadow, for which the available feed production is known.

L.A. =A.p. / (D.c. x G.d.)

L.A.- the load with animals/ha of meadow, expressed in UVM/ha;

A.p. -available production of green mass - kg/ha;

G.d. - number of grazing days in a season;

D.c. -daily consumption of grass -kg/UVM.

- the daily requirement for 1 UVM is 65 kg of green mass or = 13 kg (65:5) dry matter (SU)

Current production (C.p.) is determined or estimated in tons of green mass/ha.

The average daily requirement of grass for a large cattle unit is considered to be 65 kg/UVM/day of which 50 kg grass (10 kg dry matter) is actually consumed by the animals.

The difference of more than 15 kg of grass between the sample determined by mowing and the one actually consumed by the animals is foreseen due to climatic fluctuations with repercussions on the dynamics of seasonal or annual production as well as the degree of consumption depending on the quality of the grass.

The present study follows the evolution of sheep flocks in the pedoclimatic conditions in the area of Miersigului Plain, for the period 2016-2021.

RESULTS AND DISCUSSIONS

For the grazing season, the load with animals varies between 0.39 UVM/ha during 80 days in the forest-steppe area up to 0.99 UVM/ha during 140 days in the layer of mixed forests (beech + spruce + fir) located between 800 – 1300 m altitude, the grazing capacity being on average 0.50 UVM/ha.

If we consider the load for a whole year regardless of whether we graze directly or mow for preserved fodder (hay, silage, etc.) needed in the cold season, the forage capacity varies between 0.06 UVM/ha in the steppe zone and the alpine floor and 0.42 UVM/ha in meadows and depressions, respectively 7 times higher.

At the level of permanent meadows, this parameter is 0.27 UVM/ha/year, respectively, 1,334 thousand UVM can easily be maintained only with the fodder provided by permanent meadows.

This calculation of the average forage capacity of permanent grasslands was the basis for establishing the mandatory minimum loading level of grasslands of 0.3 UVM/ha (one cow per 3 hectares or 2 sheep per hectare).

The loading of the pasture with animals is determined according to its production. The useful production of green mass per hectare, on the meadow surfaces in the analyzed localities, was estimated at 6-8t/ha of green mass, being unevenly distributed. At the first harvest (the first grazing cycles) the production of green mass represents approximately 50% of the total production. During the summer, the production of the meadows decreases a lot due to the drought, and the grass then recovers in the fall.

Through usual maintenance and fertilization works at an average level of 100 kg/ha nitrogen active substance, this annual load would reach almost 1 UVM/ha, respectively the livestock that would rationally exploit the permanent meadows, the cheapest fodder resource, would triple.

In fact, in France for example, the animal load of a meadow is determined by multiplying the index of pastoral value (Vp) of the grass carpet by the coefficient 0.02, considering that a meadow of perennial ryegrass with white clover has a Vp close to 100 and as a result the livestock load is 2 UVM/ha/year on the most valuable meadows. There is still a long way to go before this performance, we would be satisfied for our conditions to reach 1 UVM/ha/year, average loading on permanent meadows, which would fully provide fodder for the current herds of herbivorous animals.

In Miersigului Plain, the areas of permanent meadows are quite small for the herd of animals that grow in the area, currently there are in the studied area a number of 1262 agricultural holdings for raising animals (cattle, sheep, goats and pigs), and of these the herd of sheep is the largest (Table 1, 2).

Table 1

The numbers of sheep in the period 2016 – 2021 in the localities of Miersigului Plain

Town	2016	2017	2018	2019	2020	2021
Husasău de Tinca	6184	4017	4303	4140	3569	4319
Fonău	-	0	0	0	0	0
Miersig	2791	1905	2024	2015	1714	2332
Osand	1396	2533	2557	2134	1936	2077
Sititelec	2117	1699	2054	1824	1617	1708
Tinca	6623	6446	7320	7409	6566	6547
Râpa	196	256	256	306	229	379
GirișuNegru	787	1171	1245	424	626	693
Belfir	1288	1484	1868	2062	1553	1595
Gurbediu	3859	4307	5362	5107	5317	5776
Sânmartin	10495	0	589	0	0	0
Băile Felix	0	439	338	853	591	521
Betfia	190	222	489	246	7	0
Cihei	592	549	2513	442	463	319
Cordău	2026	2440	698	2443	2269	2313
Haieu	653	615	0	667	2	0
Rontău	0	0	0	0	0	4
Apateu	1750	1608	2007	1827	1454	1498
Chișirid	1391	1241	1505	1309	1799	1595
Leș	1094	1208	1647	1459	1472	1546
Livada de Bihor	1126	1043	887	760	766	593
Nojorid	1707	1851	1845	1498	1272	113
Pausa	2057	2176	3135	2347	1336	2036
Sauaieu	1010	1130	1037	1126	1536	1390
Ianoșda	0	3229	2484	3466	3460	3534
Gepiu	2682	27781	14323	22403	19026	12189

Table 2.

The evolution of sheep flocks in the period 2016 – 2021, in the localities of Miersigului Plain

Comuna	2016	2017	2018	2019	2020	2021
Husasău de Tinca	12488	10154	10938	10113	8836	10436
Tinca	12753	13664	16051	15308	14291	14990
Sânmartin	3915	4065	4627	4651	3332	3157
Nojorid	10135	10257	12063	10326	9635	9871
Ianoșda	0	3229	2484	3466	3460	3534
Gepiu	2682	27781	14323	22403	19026	12189
Total	41973	69148	60486	66267	58580	54177

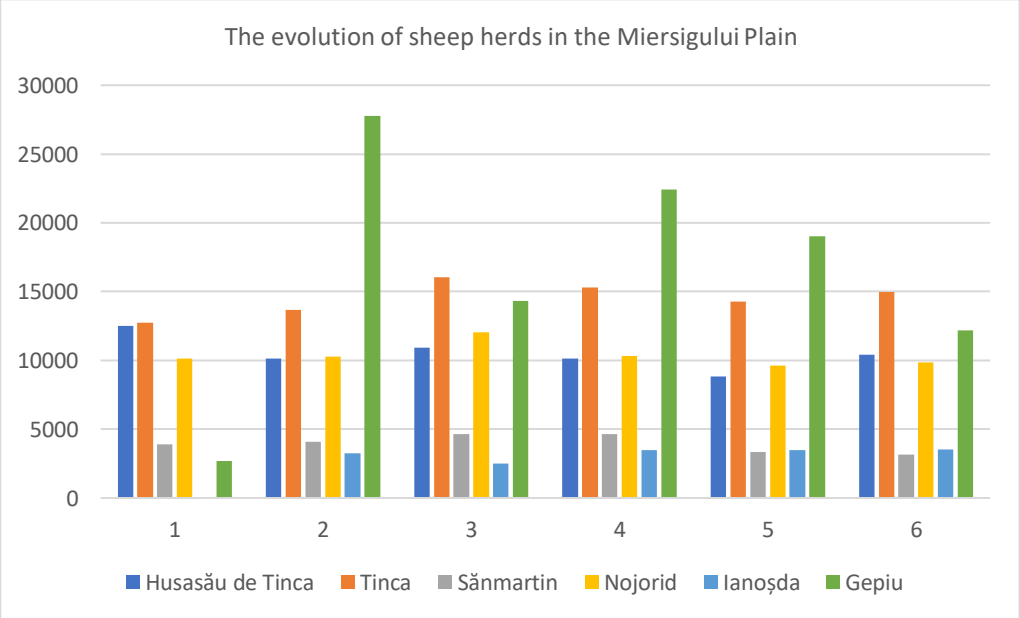

Figure 1. **Sheep herds in Miersigului Plain (2016-2021)**

CONCLUSIONS

In the area studied by us, the load of animals per surface unit is high, and due to the fact that animals are kept on pasture throughout the year, the forage value and floristic composition are negatively influenced. Sheep herds have a downward trend since 2017, a fact due to the irrational exploitation of permanent meadow areas, the overloading of meadows and the lack of maintenance works.

REFERENCES

Brînzan, T, 2013, Catalogul habitatelor, speciilor și siturilor Natura 2000 în România, SC Exclus Prod S.R.L. & R.A. Monitorul Oficial, București.

Burescu, P., 2003, Flora şi vegetaţia zonelor umede din nord-vestul României, Editura Academiei Române.

Cazacu, C., 2018, Studiu asupra efectelor livrărilor internaționale de animale vii (ovine și bovine) din România, în raport cu opțiunea livrărilor de carne congelată. Raport de cercetare realizat de Original Media. București

Coldea, G., Oprea, A., Sârbu, I., Sîrbu, C. & Ștefan, N., 2012, Les associations végétales deRoumanie; Tome 2: Les associations anthropogènes, Presa Universitară Clujeană, Cluj-Napoca

Doniţă, N., Paucă Comănescu, M., Popescu, A., Mihăilescu, S. & Biriș, I.A., 2005, Habitatele din România, Ed. Tehnică Silvică, Bucureşti.

Grodea, M., 2018, The sheep and goat farming sector in Romania-A new development perspective. Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, 18(3), 151-157.

https://cursdeguvernare.ro/romania-al-doilea-mare-crescator-de-ovine-din-uniunea-europa-dupa-spania.html

https://www.madr.ro/cresterea-animalelor/ovine-si-caprine.html

Mahara, Gh., 2003, Unitatile si subunitatile geografice ale Dealurilor Banatului si Crisanei, Analele Universitatii din Oradea, Seria Geografie, tom. VI.

Moisuc A., Samfira, I & Carrere, P., 2001, Pajişti naturale şi exploataţii ecologice, Ed. Agroprint, Timişoara.

Nudda, A. & Pulina, G., 2020. Sheep and goats respond differently to feeding strategies directed to improve the fatty acid profile of milk fat. Animals, 10, 1290-1312.

Pascal, C., 2007, Tehnica aprecierii şi evaluării performanţelor productive la ovine şi caprine. Alfa.

Pascal, C., Ionică, N., Costică, C., & Florea, M., 2018, Efectul încrucişărilor de ameliorare în creşterea producţiei de lapte la ovine. In Zootehnie şi Biotehnologii agricole (Vol. 52, pp. 81-85).

Pascal, C., Ivancia, M., & Gherasim, N., 2008, The influence of some factors on the reproductive function of Romanian local sheep. In Reproduction in Domestic Animals (Vol. 43, pp. 99-99). 9600 Garsington Rd, Oxford Ox4 2dq, Oxon, England: Blackwell Publishing.

Pop, Gr., 2004, Infrastructura si transporturile aeriene din Regiunea de Dezvoltare Nord-Vest a Romaniei, Studia UBB, Geographia, XLIX, 1, Cluj-Napoca.

Pop, Gr., 2005, Definirea, limitele si regionarea Dealurilor de Vest si a Campiei de Vest, Studia UBB, Geographia, L, 1, Cluj-Napoca.

Rotar I. & Carlier L., 2005, Cultura Pajiştilor, Ed. Risoprint, Cluj-Napoca, ISBN 973-656-8112-1

Vîntu V., Moisuc, A., Motcă, G. & Rotar, I., 2004. Cultura pajiştilor şi a plantelor furajere, Editura „Ion Ionescu de la Brad", Iaşi

White T. A., 2004, Vegetation diversity, growth, quality and decomposition in managed grasslands. Agriculture, Ecosystem and Environment 10, 73-84