WAYS OF CHOOSING SHEEP FARMING SYSTEMS ACCORDING TO FODDER RESOURCES

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Abstract: *The control of social, physical, zootechnical, herd management, technological and productive factors highlight the power of farms to choose the most efficient system of raising sheep according to the existing resources in the exploitation area. The family production system represents still the primary sheep production system, characterized by being highly dependent on natural resources and susceptible to seasonal variations. The emerging production system is expanding more and more in the resource areas and may represent the future of sheep farms because the traditional system can intensify its management and migrate to the emerging system in the future. It is recommended to direct public policies to encourage efficient succession of workers in the sheep sector, adoption of technologies and training of know-how professionals. In the choice of sheep exploitation systems according to resources, a major issue in addition to the natural resources of food for sheep must be given to the degree of qualification of the human resource which must be a permanent concern for breeders. The establishment of alternative semi-intensive or intensive farms of sheep is suitable in all farming areas where better grazing on artificial pastures can be ensured and agricultural and agro-industrial by-products are available in large quantities for feeding sheep.*

Key words*: sheep, production systems, resources*

INTRODUCTION

The choice of the most efficient sheep production system depends on a number of factors according to which the following systems are distinguished:

- cropping systems with rotational grazing [12,18], in which fodder crops must be included in the rotation program of cereals or commercial crops, being the practice of keeping uncultivated land with cereals and the use of crops fodder such as grain, millet, sorghum;

- rearing systems on pasture with shelter for lambs, characterized by [2,13]: calving control, environment and behavioral management [4,14] and parasites [11,15];

- rearing systems on pasture without shelter for lambs, characterized by calving in the first year of the ewe's life, feeding the lambs; on pasture and outdoors and behavior management [5,6];

- systems of growth on pasture with silvo-grazing [1,12], in which the establishment of silvicultural pastures improves the quality of available nutrients, ensuring its supply throughout the year;

- seasonal production systems that have many management alternatives: if spring pastures or fodder are not available, or if calving facilities are not available, there may be a demand for spring-bred ewes or ewes with young lambs; if pasture is not available for the ewes after calving, the lambs can be weaned early. It is a good way to market the feed produced on the farm and keep the work busy in the off-season being profitable if there is an abundance of pasture and crop residues that allow lamb grazing;

- the integrated crop/animal/tree production systems that should be developed to increase the production of small ruminants (sheep and goats) in the fragile ecology of dry areas [8,9];

- extensive systems, characterized by [3,7]

small inputs and outputs, are integrated with trees, shrubs, arable crops, grasses and require minimal investment in food, health care and housing. We consider these systems to be divided into systems:

- vacillating pastoral norm, which consists in the irregular movement of sheep and their breeders in search of food without a fixed base;

- sedentary, consisting in the limited movement of animals within a short radius from the permanent base.

- transhumance, which consist of regular seasonal movement with a return to a fixed base within a year, i.e. the vertical movement of the flock of sheep from high altitude to low altitude in search of fodder in winter;

- intensive systems, in which animals are kept in closed shelters, characterized by [17] temperature and environmental control, synchronized calving, balanced nutrition, artificial insemination and out-of-season mating, with high productivity potential and control of diseases [1] and parasites [10];

- semi-intensive systems, where animals are kept in partially closed facilities, characterized by: partial control of temperature and environment and feeding systems.

Sheep breeding systems according to resources can be further classified into traditional, improved and state:

- traditional production systems are:

• rural, characterized by the absence of health care, the absence of the shepherd and of the flock

• urban, characterized by the absence of sanitary assistance, the shepherd and the flock. In food are used food supplements + lumps of salt, rambling rambling in the city is done with intake of fresh grass, anarchic struggle being present;

- improved production systems:

• with guard, characterized by continuous fighting or fighting management, the presence of 1-2 night pens and the guard. The system requires the sustained presence of food supplements + mineral supplements and a prophylactic plan with vaccination [16];

• with intensified security, characterized by:

-battle management;

-presence of 1-2 night pens;

- the presence of the guard - in the savannas, on exclusive artificial pastures;

-the presence of the shepherd;

- very sustained and specific presence of food supplements + mineral supplements;

-the presence of a prophylactic vaccination plan and the care of sick animals;

• in rambling, characterized by:

- absence of the shepherd;

- wandering in the villages and in the surrounding fields;

- continuous struggle;

- discontinuous presence of food supplements + mineral supplements;

- the presence of a night park;

- the presence of a prophylactic plan with vaccination;

• state production systems, characterized by:

- battle management, matching pairs;

- very sustained presence of food supplements with intensification in key periods + mineral supplement;

- the presence of several stables, an anti-tick bathroom, a storage shed, offices and a training center;

- the presence of guards along the way – in the savannah with additional artificial pastures;
- the presence of technicians and shepherds;
- the presence of a prophylactic plan with vaccination, of the daily care of sick animals. [14]

MATERIALS AND METHODS

Choosing the most efficient meat production system according to resources, requires the analysis of the farms typology using multivariate analysis techniques with the aim of identifying sheep production systems.

As part of this scientific approach, the identification of the most efficient production systems was pursued according to the typology and characteristics of the farms:

-with young adult farmers, medium and livestock farms, intensive management, intermediate technological level and high meat production - emerging systems;,

- with adult farmers, small farms, small herds, low technological level and low meat production - conventional systems;
- with mature farmers, large and effective farms, extensive management, low technological level and high meat production – traditional systems

RESEARCH RESULTS

The complexity of livestock production systems involves the interrelation of physical, technical, social, environmental and animal factors. For these reasons sheep production systems must be classified to be able to characterize and analyze farms by production typology highlighting all the factors responsible for the differences between sheep farm typologies in the exploitation region, plain, hill and mountain. The social, physical, zootechnical, herd management, technological and productive factors showed the discriminatory power to differentiate the typologies. The family productive system still represents the primary sheep production system, characterized by being highly dependent on natural resources and susceptible to seasonal variations. Some common characteristics among the farms studied were the use of family labor and the predominance of extensive breeding with low stocking density.

The emerging system is expanding and may represent the future of sheep farms because the traditional system can intensify its management and migrate to the emerging system in the future. It is recommended to direct public policies to encourage efficient succession of workers in the sheep sector, the adoption of technologies and the training of know-how professionals. The insertion of young farmers was considered a determining factor in the future of the sheep production system in the studied region rich in fodder resources. The culinary (food quality), economic, ecological and social benefits of sheep grazing for meat and milk production in mountain areas must also be considered. This system, which faces significant challenges (aging workforce, integration into global markets, low social respect, risk of economic bankruptcy, competitive land use), has four levels of analysis (Figure 1).

In choosing sheep exploitation systems according to resources, a problem is the natural resources of food for sheep and must be a permanent concern for breeders. The establishment of semi-intensive or intensive alternative farms sheep is suitable in all exploitation areas where:

- better grazing can be ensured (areas with marginal or higher rainfall);
- the lands taken out of fallow from the rainfed areas can be replaced with forage leguminous crops;

- fodder can be produced through irrigation by introducing fodder crops in rotation with food crops;
- agricultural and agro-industrial by-products for feeding sheep are available in large quantities.

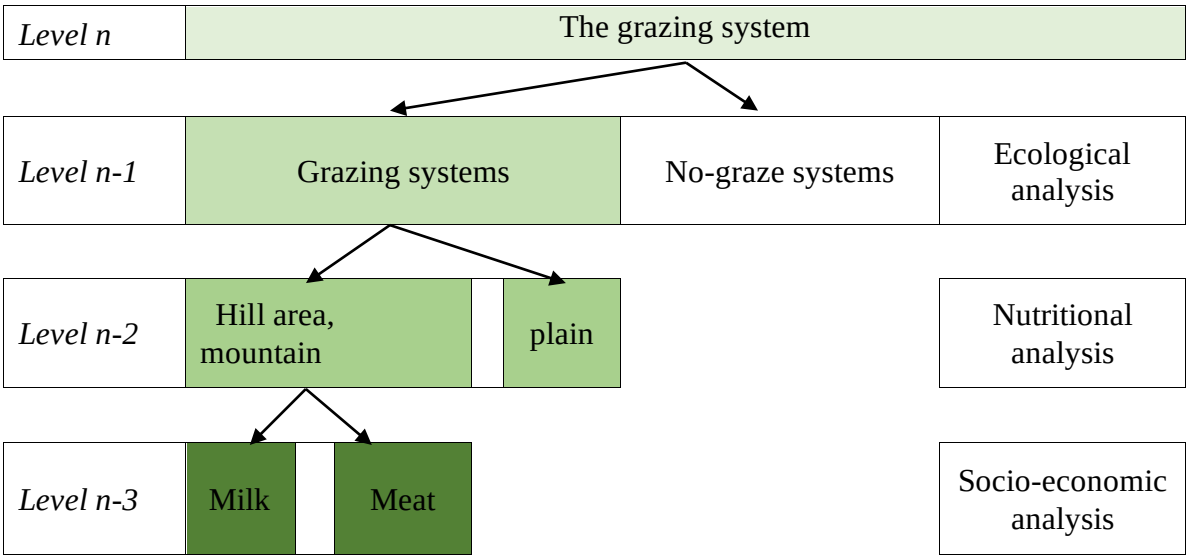

Figure 1. Grazing system levels for mixed milk-meat production
Source: own creation

In the areas where transhumance is practiced due to the existence of quality resources, it is necessary to organize wintering areas according to the model imposed for implementation:

- winter camps, when the animals are provided with natural resources and additional food in the pastures (November – mid-April);
- of spring migration to the summer pasture;
- a short stationary period for adaptation (June – mid-July);
- of migration to the summer pasture in the months of July and August;
- of slow migration to the improved autumn pasture until mid-October;
- rapid migration back to the wintering area.

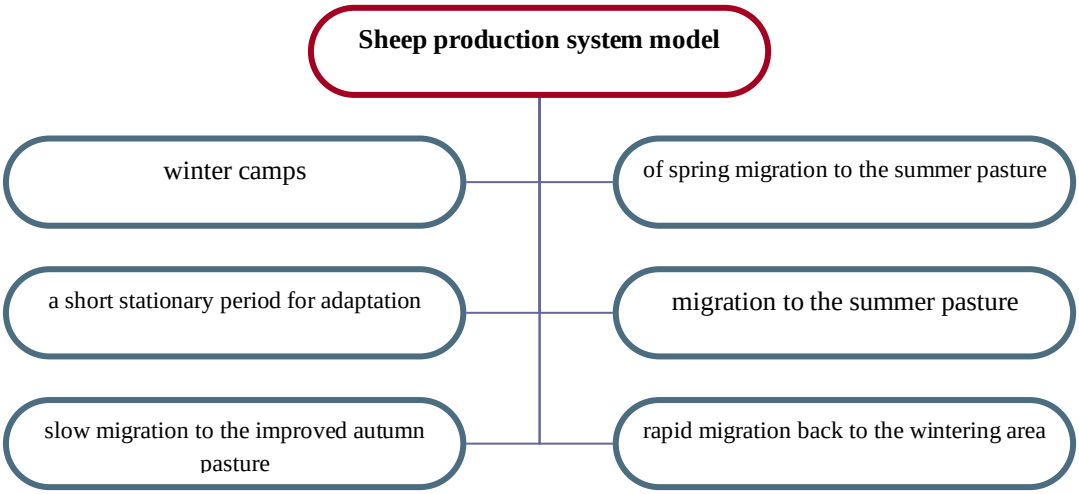

Figure 2. Sheep production system model according to resources
Source: own creation

The use of non-conventional feed sources by sheep may be the main reason for lower production due to the large gap between nutritional requirements and nutrient supply for sheep. There is a clear justification for building feed resources in considerable amounts of crop and other agro-industrial products). Several factors can explain their limited use: the difficulty of handling and long-term use and their low nutritional value. It is essential to increase the amount of forage by growing more forage plants, improving the nutritional value of crop residues, propagating agricultural and social forestry and using other non-conventional food resources. Foliage, crop residues and agro-industrial products have an increasingly important role as food in the future as human and animal populations grow.

The impact of climate change and the adaptation of sheep to these changes on growth are perceived as differences in seasonal temperatures, feed resources in considerable amounts of crop and other agro-industrial products. Access to extension services increased the likelihood of sheep adapting to these changes and climate change information to improve livestock production played a significant role in the selection of adaptation measures. Therefore, it is important to consider sheep farmers' perceptions of climate change when making decisions about sheep production and adaptation programs. These activities should be considered a preliminary step in the choice of production systems, although everything is essential from the perspective of integrated land management and sustainable rural development of pastoral areas. From the investigation of choosing ways of sheep exploitation systems according to resources, it is found in the researched area that most farmers use transhumance more or less to find cheaper food resources and that this production system, together with the intensive alternative system, is the predominant system for raising sheep. This is mainly due to the ratio between own land and the size of sheep flocks.

CONCLUSIONS

Choosing the most efficient production system according to resources involves the interrelationship of physical, technical, social, environmental and animal factors and must be a permanent concern for sheep farmers, because the family productive system still represents, the primary sheep production system, characterized by the use of familiar human resources, at low herd densities, extensive technologies, largely dependent on natural resources and seasonal variations of food.

The establishment of semi-intensive or intensive alternative sheep production farms can ensure good operating conditions and better grazing in areas with marginal or higher rainfall, if additional feed resources are provided in considerable quantities from the crop and other agro-industrial products.

The access to extension services has increased the probability of sheep adaptation to climate change and the improvement of production will have a significant role in the selection of adaptation measures, the perception of breeders being important when they make decisions regarding programs for sheep production and plan adaptation programs and agropastoral activities. These activities should be considered a preliminary step in choosing production systems, although everything is essential from the perspective of integrated land management and sustainable rural development of pastoral areas. The challenge for the future of transhumance and alternative production systems, nationally and internationally, is to ensure continuity in the exploitation area, by increasing public awareness of the multifunctional role of the system, naming environmental, economic, social and cultural benefits and, mainly to communicate that the cost of losing the system is far greater than the effort.

REFERENCES

[1]. ANDRICIUC R., 2008, Managementul protecţiei infrastructurii critice, Editura Psihomedia, Sibiu

[2]. ADZIG P., VÎRTOSU D., BABA F., PETROMAN I., BRAD I., VĂDUVA LOREDANA, DUMITRESCU CARMEN, PETROMAN CORNELIA, 2018, Judicious placement of small professional farms of cattle in order to avoid the environment pollution. Journal of Biotechnology, 280

[3]. GRUIA R., 2006, Integronic management and informational connections, HAICTA – International Conference on Information Systems in Sustainable Agriculture. Agroenvironment and Food Technology, University of Thessaly, Volos, Grecia

[4]. LEXICO, Available at: https://www.lexico.com/

[5]. MARIN DIANA, PETROMAN I., PETROMAN CORNELIA, BĂLAŞA M., CSAHOLCZI A., 2015, Study on specific activities of agrotourism. Research Journal of Agricultural Science, 47(4)

[6]. NEAGU IULIANA, CULEA C., PETROMAN I., 2007, Creșterea animalelor, Editura Eurostampa, Timișoara

[7]. NINE THINGS YOU NEVER KNEW ABOUT SHEEP, Available at: https://www.bbc.co.uk/

[8]. NUTHAL P. L., 2010, Farm Business Management: The Human Factor. Wallingford- Cambridge, CABI

[9]. PETROMAN CORNELIA, PALADE S., PETROMAN I., POPA DANIELA, ORBOI MANUELA DORA, PAICU D., HEBER LOREDANA, 2010, Managerial strategies for the conservation of rurality in rural tourism. Animal Science and Biotechnologies, 43(2)

[10]. PETROMAN I. M., PETROMAN I., 2013, Conservarea autenticității prin activități agroturistice, Editura Eurostampa, Timișoara

[11]. PETROMAN I. M., VĂDUVA LOREDANA, 2021, Forms of active tourism, Quaestus, 271-279

[12]. PETROMAN I., PETROMAN CORNELIA, 2010, Agritourism and its forms, Lucrări Științifice Serie Agronomie, 53(2)

[13]. JAMES REBANKS, 2015, The Shepherd's Life: A Tale of the Lake District

[14]. SIASIOU A., KARELAKIS C., GALANOPOULOS K., MITSOPOULOS I., LAGKA V., 2021, Typology of Management of Transhumant Sheep and Goat Farms in Greece: Proposals for the System Continuity, European Journal of Agriculture and Food Sciences, 3(1), 84-89. DOI: 10.24018/ejfood.2021.3.1.228.

[15]. VĂDUVA LOREDANA, PANDURU ELISABETA BIANCA, PETROMAN CORNELIA, ADAMOV TABITA, MARIN DIANA, PETROMAN I., 2020, Tourism forms practicable in protected areas, Agricultural Management/Lucrări Științifice, Seria I. Management Agricol, 22(1)

[16]. VĂDUVA LOREDANA, PETROMAN I.M., 2021, Forme alternative de turism, Editura Eurostampa, Timișoara

[17]. VĂDUVA LOREDANA, 2013, The influence of endogenous and exogenous factors on meat quality of pigs, Scientific Papers Animal Science and Biotechnologies, 46(1), 404-406

[18]. VĂDUVA LOREDANA, 2013, The influence of operating system on food and water consumption of fat pigs**,** Scientific Papers Animal Science and Biotechnologies, 46(2), 428-430.