



ULST Timisoara
**Multidisciplinary Conference on
Sustainable Development**
21-22 May 2026



EFFICIENT MANAGEMENT OF RESOURCES IN SHEEP FARMING

Loredana VĂDUVA ^{1*}, Diana MARIN ¹, Daniela VĂLUŞESCU ², Ana-Gina ARMAŞ ²,
Iulia MUNTEANU ², Ioan PETROMAN ²

¹ University of Life Sciences “King Mihai I”, Faculty of Management and Rural Tourism, Timisoara

² Development Research Station for Raising Sheep and Goats, S.C.D.C.O.C. Caransebeş

*Corresponding author's e-mail: loredanavaduva@usvt.ro

Abstract: This paper analyses current research trends regarding the efficient management of key resources in sheep farming, namely energy, pastures, and water. Based on recent scientific literature, the authors emphasize that optimal resource utilization is essential for ensuring herd health, improving long-term farm resilience, and maintaining economic profitability. In the context of increasing environmental pressures and fluctuating input costs, efficient resource management is presented as a central component of sustainable sheep production systems. The study first outlines the importance of each resource individually. Energy management is discussed in relation to feed efficiency, metabolic performance, and the optimization of dietary inputs to reduce waste and improve productivity. Pasture management is examined through the lens of grazing strategies, carrying capacity, and vegetation recovery, highlighting the need to balance animal demand with ecological sustainability. Water management is also addressed, focusing on availability, quality, and distribution systems that ensure adequate hydration while minimizing losses and contamination risks. For each resource, the authors evaluate both advantages and limitations of existing management practices, showing that improvements in one area may sometimes create challenges in another. This reinforces the complexity of livestock production systems and the need for integrated approaches. The paper concludes that efficient management cannot be achieved through isolated strategies but requires the integration of energy, pasture, and water resources into a coherent and coordinated system. Such an approach enhances overall farm efficiency, supports environmental sustainability, and improves the long-term viability of sheep farming operations.

• Introduction

Efficient management of key resources—namely energy, pastures, and water—represents a fundamental pillar of sustainable sheep farming systems. In recent decades, increasing environmental constraints, climate variability, and rising production costs have intensified the need for optimized resource utilization in livestock production. In this context, sheep farming systems, particularly those operating under continental climatic conditions characterized by dry summers and fluctuating forage availability, are especially vulnerable to inefficiencies in resource management.

A growing body of scientific literature highlights that suboptimal use of energy, pasture, and water resources can negatively affect animal health, productivity, and overall farm profitability.

• Material and method

The present study is based on a qualitative bibliographic research approach, aiming to synthesize and critically analyze existing scientific literature on resource management in sheep farming systems. The focus is placed on three key resource categories: energy, pastures, and water. The materials analyzed consist of peer-reviewed scientific articles, review papers, and relevant academic publications addressing resource management in sheep farming. The selection of sources was guided by their relevance to the research topic, scientific rigor, and recency, with particular emphasis on studies published in the last two decades. Inclusion criteria comprised studies that: address at least one of the three key resources (energy, pasture, or water), focus on sheep farming systems or comparable grazing livestock systems and provide empirical data, experimental results, or comprehensive reviews of management practices. Exclusion criteria included publications lacking scientific validation, studies not directly related to livestock systems, or those with insufficient methodological transparency. The selected literature was analyzed using a comparative and integrative approach.

• Results and discussion

Sheep are adapted to the most extreme environmental conditions; are among the most efficient of all the domestic animals and have been for thousands of years; are very agile; can use, practically, all types of forage, including crop residue and even ditch banks; graze easily in the most rugged of mountain terrain; and have the ability to convert the natural forage of extreme habitats into protein for human uses. However, there are advantages (sheep are easy to handle; can provide a quick return on investment; consume roughage as their primary feed; do not require elaborate facilities and equipment; help control weeds; provide two sources of cash income – lamb and wool; require a minimum amount of supplemental feeding; and require little input) and disadvantages (sheep are subject to predation by bears, domestic dogs, and jackals; face health problems when they are intensively grazed on irrigated pastures; need to be well managed; and require good fencing) in producing sheep.

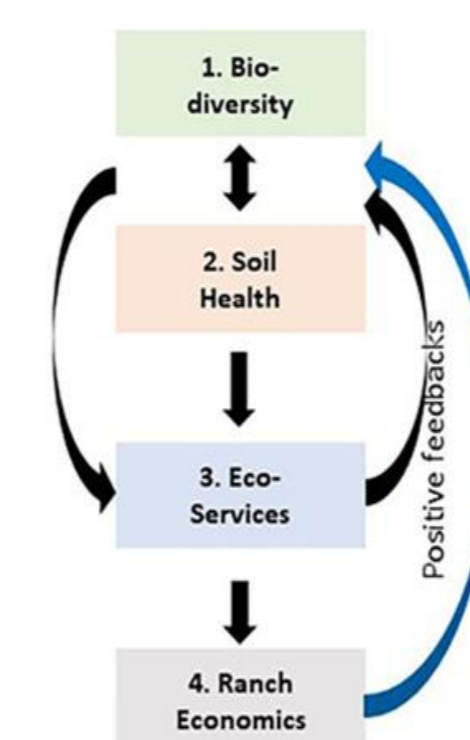


Figure 1. Impact of grazing systems on biodiversity, eco-services, farm economy, and soil health

• Conclusions

Efficient management of the resources (energy, pasture, and water) necessary for the proper functioning of sheep farms involves combining and integrating these resources into a coherent and efficient system: rainwater collection, which allows watering in any plot and reduces pumping costs; rotational grazing, which reduces the need for feed and lowers energy consumption for transport and storage; and solar panels, which allow more frequent rotations, make pastures more productive, and provide energy for electric fences.