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Reproductive Performance in Sheep under Organic and Conventional Farming Systems

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Abstract: Reproductive performance in sheep is a key factor for the biological and economic efficiency of farming systems. This study presents a comparative literature-based analysis of organic and conventional sheep farming systems, focusing on fertility, fecundity, conception rate, prolificacy, seasonality, nutrition and animal welfare. The results show that reproductive efficiency is not determined only by the farming system, but mainly by the quality of management, body condition, feeding strategy, breed potential and reproductive organization.

Introduction

Sheep farming plays an important role in animal production by providing meat, milk and wool, while also valorising pastures and marginal lands. In recent years, organic sheep production has gained increasing interest due to concerns related to sustainability, animal welfare and reduced use of synthetic inputs.

However, organic farming does not automatically ensure superior reproductive results. Reproductive performance depends on the interaction between biological, nutritional and management factors, such as body condition, seasonality, feeding strategy, welfare and reproductive planning.

Therefore, this paper aims to comparatively analyse reproductive performance in sheep under organic and conventional farming systems, with emphasis on fertility, fecundity, conception rate, prolificacy, seasonality, nutrition and animal welfare.

Materials and methods

The study was based on a bibliographic analysis of scientific literature concerning reproductive performance in sheep under organic and conventional farming systems.

Scientific papers and review articles were selected from Scopus, Web of Science and Google Scholar. The main keywords used were: organic sheep farming, conventional sheep farming, reproductive performance, fertility, fecundity, conception rate, prolificacy, seasonality, nutrition and animal welfare.

The collected information was analysed descriptively and comparatively in order to identify the main factors influencing reproductive efficiency and to highlight the advantages and limitations of each farming system.

Results and discussions

The literature shows that reproductive performance in sheep is influenced by genetic potential, nutrition, body condition, seasonality, welfare and reproductive management (Table 1). Organic systems rely mainly on pasture, local feed resources, natural estrus and natural mating, while conventional systems allow stricter control of feeding, reproduction and health management.

Fertility and conception rate are strongly related to body condition score, liveweight at mating, parity, season and mating organization. Prolificacy depends mainly on genetic potential, breed, nutrition and body condition before mating.

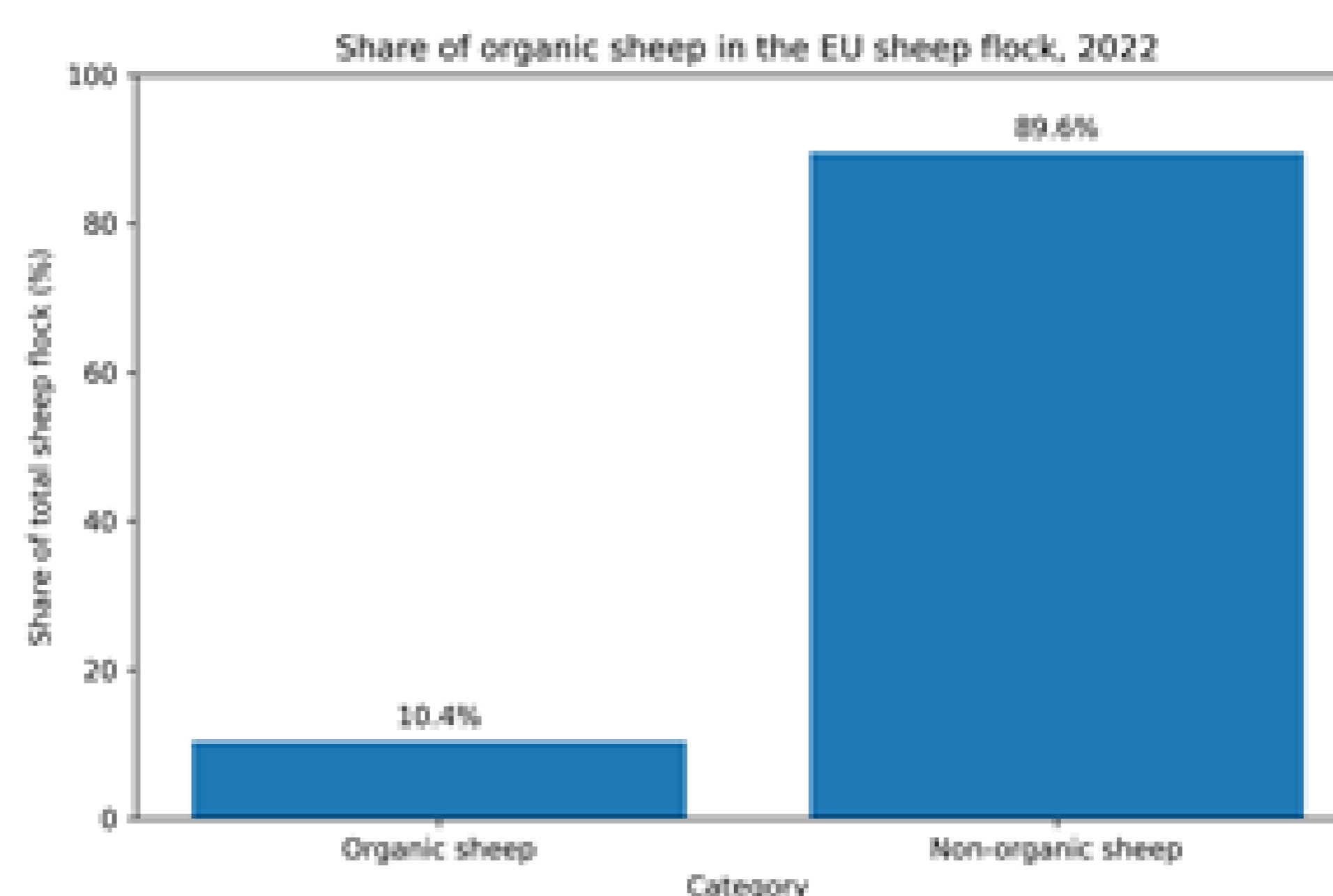
Overall, good reproductive performance can be achieved in both organic and conventional systems when feeding, welfare and reproductive management are properly adapted to the animals and farm conditions.

Conventional systems provide greater reproductive control, while organic systems depend more on natural estrus, adapted breeds, pasture quality and careful flock monitoring. In both systems, reproductive success depends mainly on adapting management to the animals' biological needs and farm resources.

Table 1. Main factors associated with fertility, fecundity and conception rate in sheep

Factors evaluated	Main findings
Natural estrus, body condition, lactation status	Acceptable fertility was obtained under natural estrus; better results were associated with lactating ewes and better body condition.
Body reserves dynamics	Reproductive performance was closely associated with body reserve status.
Parity, non-breeding season	Nulliparous ewes showed poorer reproductive response and lower fertility than multiparous ewes.
Liveweight, body condition score	Higher liveweight and better body condition at breeding improved reproductive performance.
Nutritional flushing	Nutritional supplementation improved body condition and reproductive parameters.
Mating conditions, management practices	Pregnancy outcomes were influenced by body condition, liveweight and ram percentage.
Endogenous and exogenous factors	Fertility and conception depend on multiple biological and management-related factors.

Reproductive efficiency depends mainly on nutrition, body condition, welfare and mating management, rather than on the production system alone. In 2022, organic sheep represented 10.4% of the EU sheep flock, showing that this sector remains smaller than conventional farming, but relevant for sustainable livestock production (Figure 1).



Non-organic sheep accounted for 89.6% of the total sheep population in the European Union in 2022, showing that conventional sheep farming remained predominant. These data show that non-organic sheep farming remains predominant, while organic sheep production represents a relevant component of sustainable livestock systems.

Conclusions

Reproductive performance in sheep depends on genetics, nutrition, body condition, seasonality, welfare and management. Neither organic nor conventional systems automatically guarantee better reproductive results. Conventional systems allow greater reproductive control, while organic systems require better adaptation to natural estrus, local resources and animal welfare. Overall, reproductive efficiency can be improved in both systems through proper feeding, reduced stress and good mating management.