

Self-sufficient pasture-based farms enhance economic performance and provision of ecosystem services

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Introduction

- Sheep farming systems in the Euro-Mediterranean basin:
 - Usually located High Nature Value (HNV) areas
 - Mixed cereal-sheep systems
 - Linked to semi-natural and natural areas
 - Well-adapted autochthonous breeds
- Intensification process:
 - Reduction or abandonment of grazing
 - Augmentation of indoor feeding
 - Substitution of on-farm natural resources with external inputs



Aim

Explore relationships between farm management practices and techno-economic parameters, and the provision of ecosystem services.



Material and Methods: Farms

- We surveyed 30 mixed cereal-sheep farms in a HNV area in North-West Spain rearing a local breed.
- 32 indicators were calculated, regarding farm structure, management and productivity.
- Statistical Analysis: a Principal components analysis and a Cluster analysis.
- GLM to identify differences among clusters.



Material and Methods: Focus Groups

- We performed and recorded 5 focus groups (FG):
 - FG: 2 with farmers, 3 with urban citizens.
 - 6-8 people per FG.
 - 1-1,5h per FG.
- Discussion about relationships between pasture-based livestock production in mountain/HNV areas and the environment.
- Topics/ideas mentioned during the FG were identified and classified according to the ES framework.



M & M: Ecosystem services framework

“Direct or indirect benefits people obtain from ecosystems”

Provisioning

Products obtained from the ecosystems

- Food
- Timber
- Fiber
- Fresh water
- etc.

Regulating

Benefits obtained from the regulation of ecosystem processes

- Water purification
- Regulation of climate
- Control of diseases
- Erosion prevention
- Waste decomposition
- etc.

Cultural

Nonmaterial benefits people obtain from ecosystems

- Aesthetic experience
- Spiritual enrichment
- Cognitive development
- Recreation
- etc.

Supporting

Necessary for the production and maintenance of all other ecosystem services

- Primary production
- Soil formation
- Nutrient cycling
- etc.

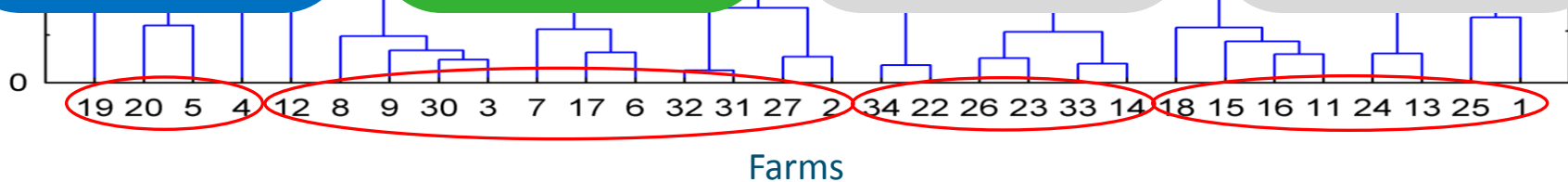
Results: Farm types

Intensive high-inputs (13%): high numeric productivity, high use of concentrates and inputs, low feed self-sufficiency and grazing rates.

Self-sufficient low inputs (40%): pasture-based and low use of inputs, that does not impair numeric productivity; greater economic performance.

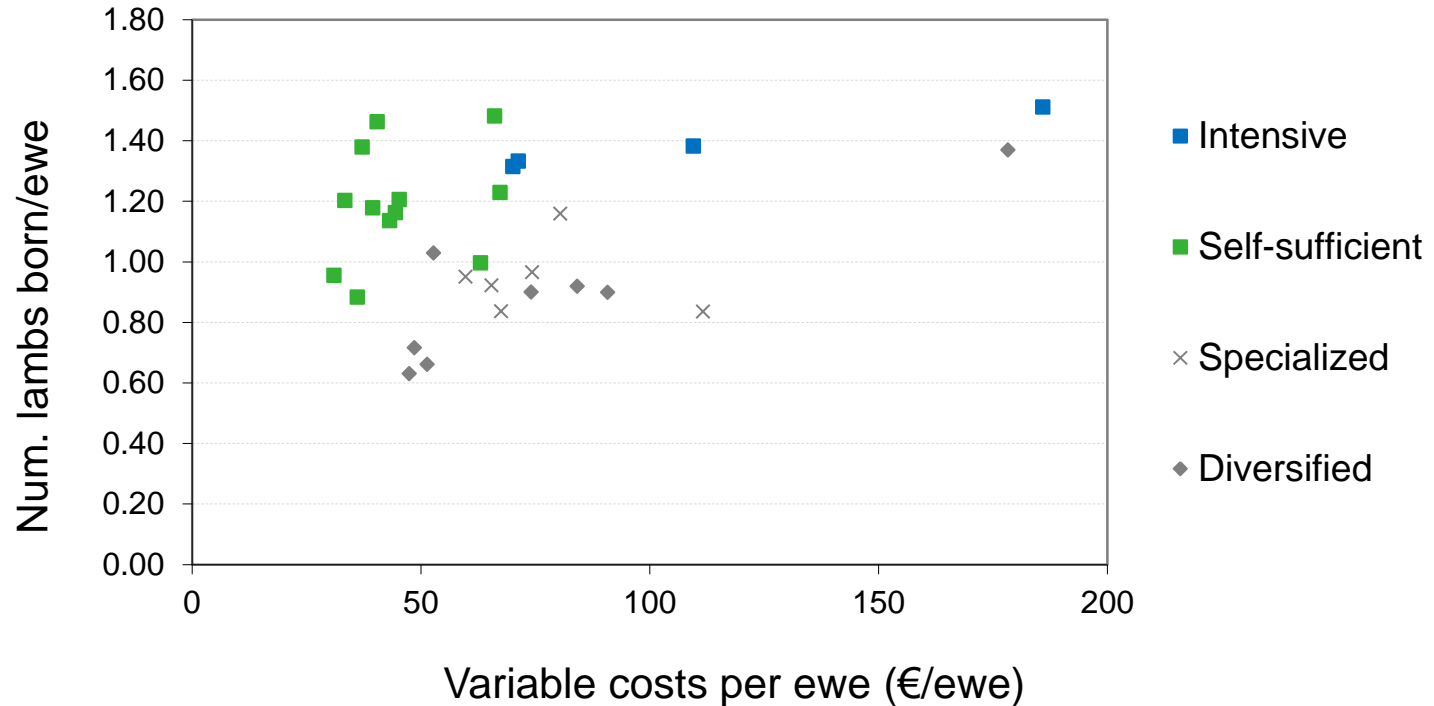
Specialized (20%): livestock production based farms; high use of inputs, but yield low numeric productivity.

Diversified (27%): crop production oriented farms, livestock as complementary activity; small and low productive herds.



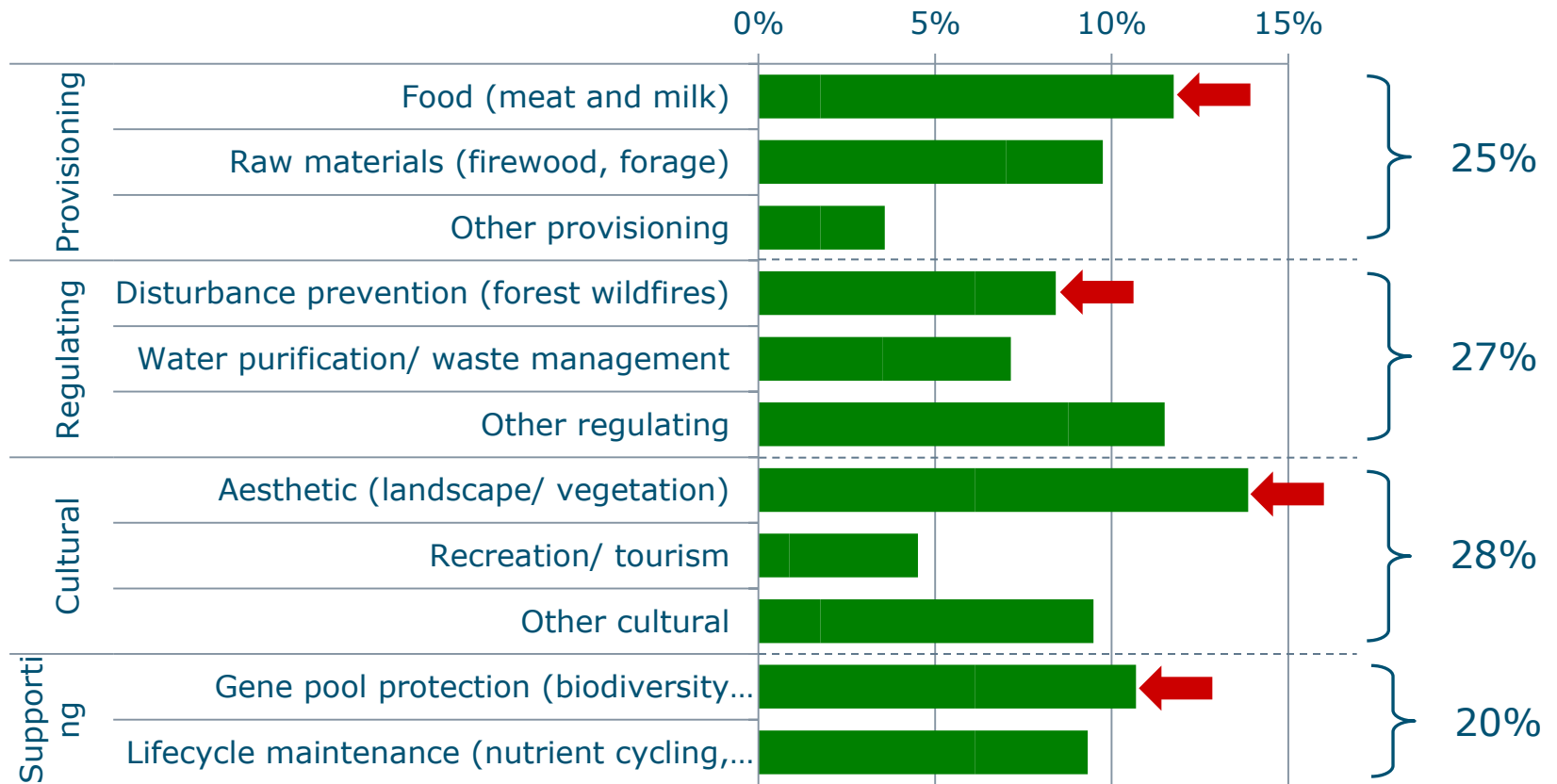
Indicator	Units	Intensive	Self-sufficient	Specialized	Diversified
Numeric productivity	Lambs/ewe	1.38 ^a	1.19 ^a	0.95 ^b	0.89 ^b
Inputs per ewe	€/ewe	76.00 ^a	26.08 ^c	41.17 ^b	37.38 ^c
Grazing in the diet	%	45.0 ^b	77.7 ^a	61.4 ^b	59.6 ^b
Profitability per WU	€/WU	6214 ^b	23311 ^a	4402 ^b	4721 ^b

Results: Intensification



- Response to intensification is limited
- Improvement in pasture-based farms is still possible
- Better economic results, thanks to lowering feeding costs

Results: Ecosystem services



- Pasture-based systems deliver a wide range of ES

Conclusions

- Intensification of production systems does not always yield better economic results or improve efficiency.
- Pasture-based systems should be a target for future research due to its link to the farm economic performance and the potential provision of ecosystem services.

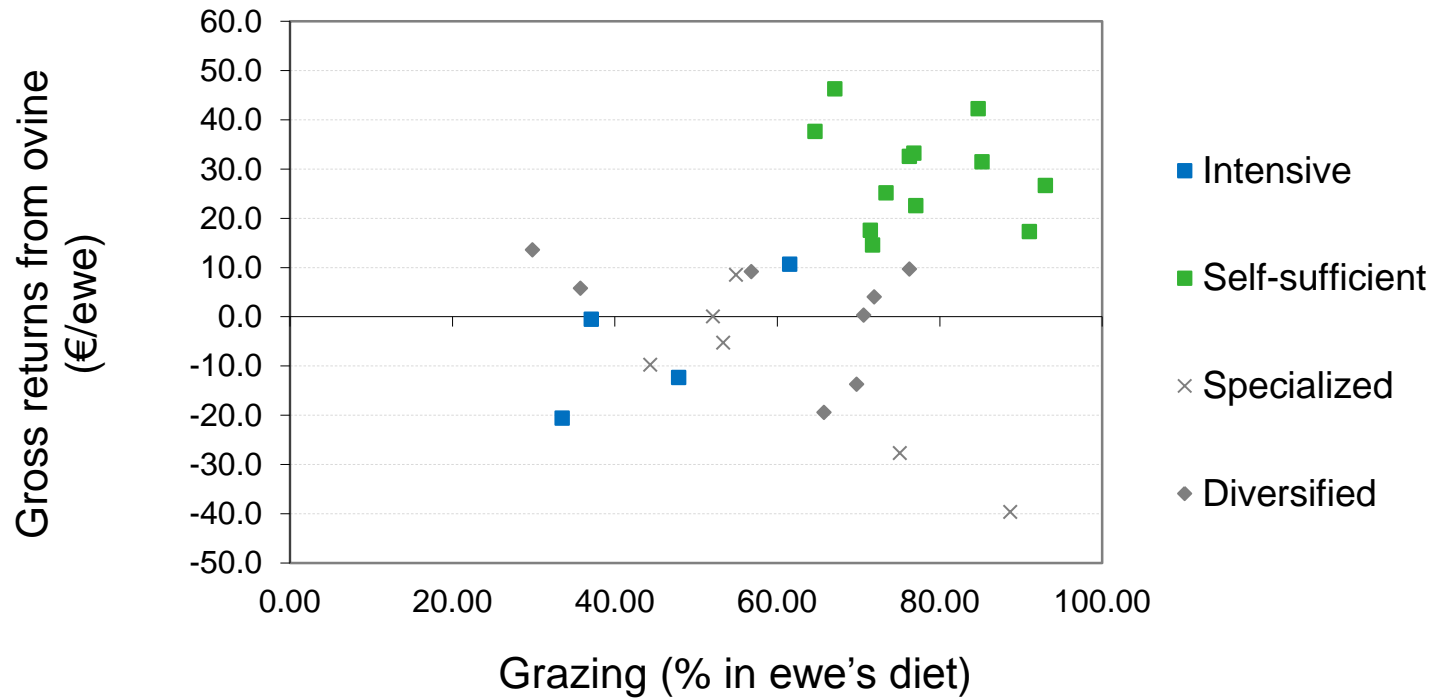
Any questions?

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Pictures from:
Col·lectiu de pastors i pastores de Catalunya
(*Collective of shepherds from Catalonia*)



Results: Intensification



Results: Ecosystem services

