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Farm resilience: a farmers' perception case study

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GENTORE
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Introduction

The number of mountain farms is decreasing

- Internal factors
  - Use of natural resources, farmers' age
- External factors
  - Agricultural policy, environmental conditions, market dynamics
    - Increasing risk of droughts
    - Higher prices of inputs

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Objectives

- The aim of this work was to analyze:

i) Farmers' perception about strategies to face a situation of climate and market change and,

ii) the influence of farms and farmers' characteristics on those strategies

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Methodology

- Data collection

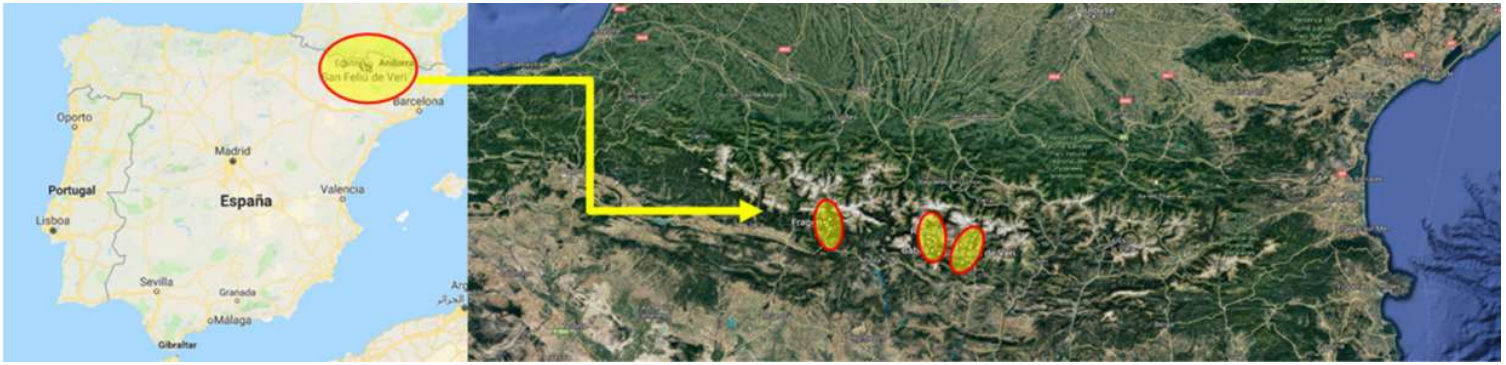
Survey on 54 beef farmers

Farmers' perception

Farm structure, management and economic performance

2-year-long drought

Rise of input prices



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Methodology

- Data collection

- ✓ **Reproduction**
- ✓ **Sanitary management**
- ✓ **Feeding**
- ✓ **General management**
- ✓ **Commercialization**

In these situations, would any of these measures improve the continuation of your farm and how important would they be?

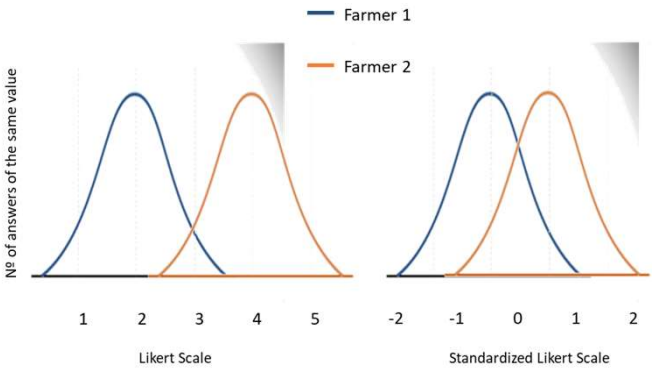
	Prolonged drought					Increase in input prices				
	1. Not imp.	2. Little imp.	3. Important	4. Considerably imp.	5. Very imp.	1. Not imp.	2. Little imp.	3. Important	4. Considerably imp.	5. Very imp.
Reproduction										
Group births in specific periods										
Incorporate reproductive technology										
Follow a specific management program for heifers										
Sanitary management										
Intensify disease prevention and control programs										
Eliminate the worst adapted animals										
Feeding										
Extend the grazing season										
New grassland areas										
Modify barn diets										
Seek self-sufficiency (self-produced food)										
General management										
Modify herd size										
Introduction of new breeds										
Modernize machinery and facilities										
Seek technical advice										
Commercialization										
Change the type of product										
Produce under some quality brand										
Collectively market										
Diversify the activity within agriculture										
Diversify off-farm activity										

Methodology

- Data processing and analysis

- Likert scale and ANOVA

- Standardization



Likert scale

Most valued actions

Less valued actions

ANOVA

Farm and Farmer characteristics influence in farmers' views

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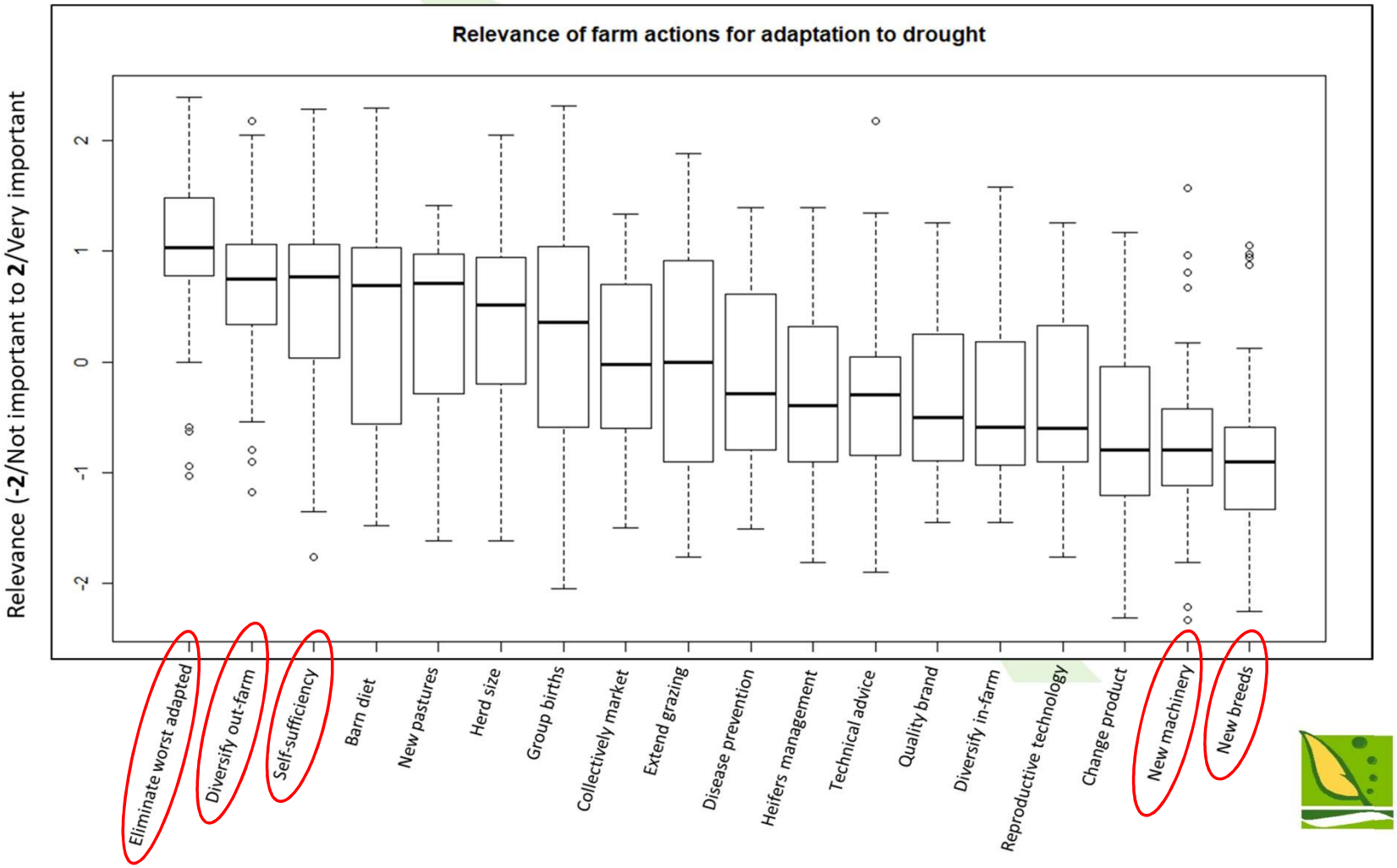
Results: Drought



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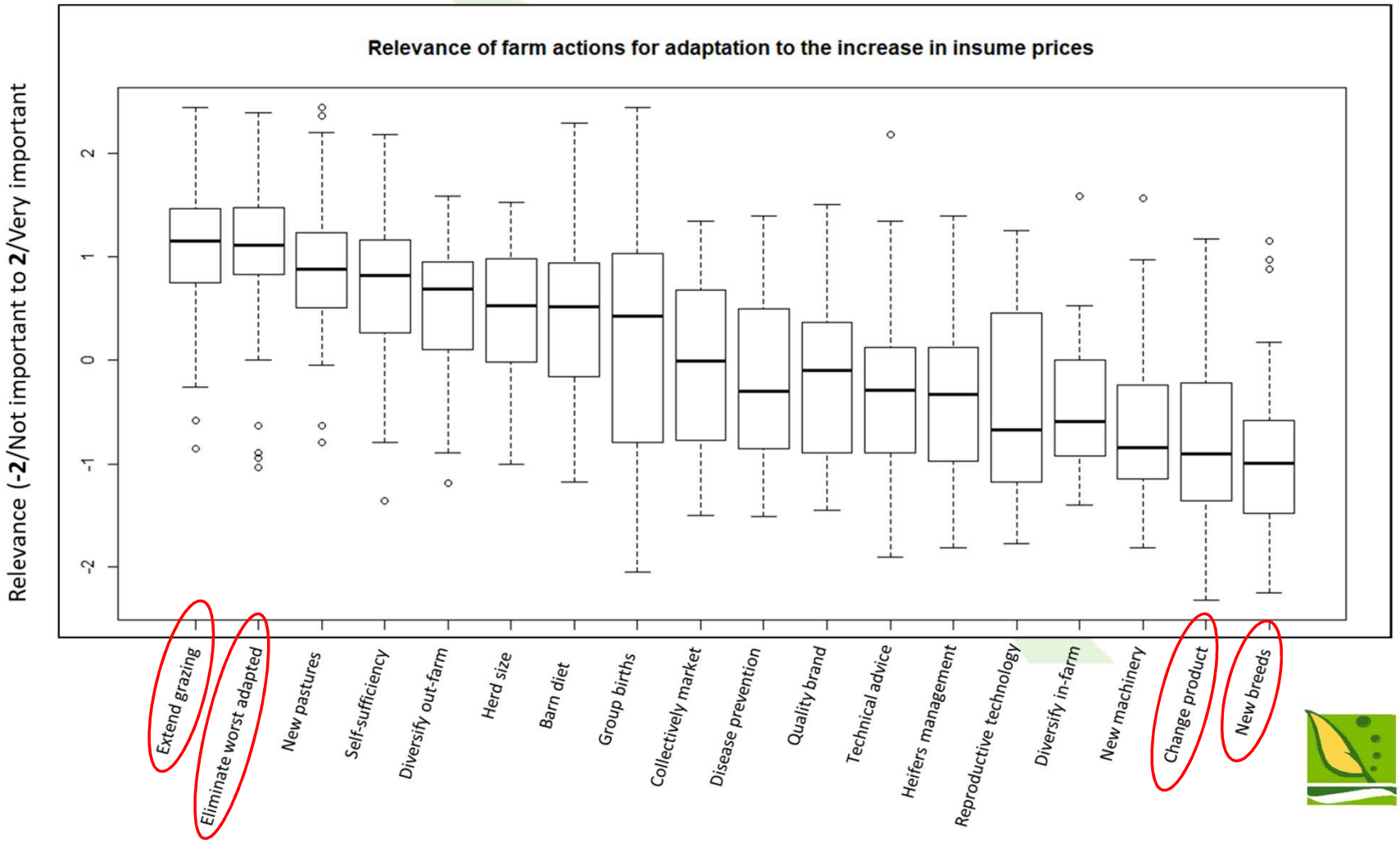
Results: Inputs prices



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Results: Farms and farmer characteristics

Scenario	Variable	a	b	ANOVA		Pair-Wise test
	Age	Young (<51)	Old (>51)	F	p	ab
Increase prices	New pastures	0.493	1.126 ↑	5.621	0.0251 *	0.026

Scenario	Variable	a	b	ANOVA		Pair-Wise test
	Fattening	No	Yes	F	p	ab
Increase prices	New pastures	1.08 ↑	0.389	6.482	0.0167 *	0.027
	New machinery	-0.844 ↓	-0.248	4.607	0.04 *	0.057
Drought period	New machinery	-0.87 ↓	-0.173	6.685	0.0135 *	0.018

Scenario	Variable	a	b	ANOVA		Pair-Wise test
	Land Area	Big (>77 ha)	Small (<77)	F	p	ab
Drought period	Barn diets	1.104 ↑	0.166	8.211	0.00654 **	0.00024

Final remarks

1. Farmers considered eliminating worst adapted animals, diversifying activity out agriculture and seeking for new pastures and self-sufficiency as some key strategies for both, increase in inputs prices and a period of droughts scenarios.
2. In a 2-year-drought scenario farmers considered modifying barn diet as one relevant action, while this wasn't too relevant in an increase in inputs prices scenario.
3. Farm and farmers' characteristics such as farmer age, size of agricultural area and whether they fatten in farm or not were relevant to identify how farmers face these challenges.

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Final remarks

4. Some of the most relevant actions that are usually pointed out when analyzing farming at a systemic level such as introducing more adapted breeds, diversifying farm activity, seeking for external advice or modernizing farm technologies, were considered by farmers as having low importance.
5. And as a final remark, note that this study focused on how farmers would adapt to short term scenarios, and that their strategies to adapt to mid or long-term perturbations might be different.

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Thank you for your attention

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How much is enough – the effect of nutrient profiling on carbon footprints of 14 common food products

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Life cycle assessment (LCA) of agri-food systems has received criticism on functional units in recent years; namely, those based on mass (e.g. environmental impacts per kg product) fail to reflect the nutritional value of individual commodities. Consequently, a wave of novel research has materialised over the last decade, with a shifting focus from product quantity to quality. Although no single methodological solution has been agreed upon nor uniformly adhered to, one of the more popular options is using nutrient profiling to estimate environmental impacts per proportion of daily nutritional requirements satisfied by a commodity. Derivation of nutrient indices, however, necessitates a selection of nutrients to be included, and the impacts of this decision on LCA results are not generally well-understood. The aim of this study, therefore, was to examine the effect of adopting four different nutrient density scores (NDS) on the relative carbon footprints (CF) amongst 14 food products commonly consumed as protein sources. Mass-based CF from 737 production systems around the world were sourced from a recently-published meta-analysis and recalculated using nutritional data obtained from USDA. NDS were calculated using either 6, 9, 11 or 15 nutrients to encourage and, in all cases, 3 nutrients to discourage (saturated fat, sodium and total sugar). Under the mass-based functional unit (100 g product), animal-derived products almost always showed higher CF than plant-based products. When nutritional quality was accounted for, however, product rankings became less clear-cut. For example, pork and tofu generated global averages of 1.141 and 0.324 kg CO_2-eq/100 g product, yet 0.145 and 0.149 kg CO_2-eq/1% NDS under the 15-3 scoring. This reversal of rank results from superior nutritional composition of pork over tofu and suggests that, if consumed according to optimal dietary intakes, less pork would be required than tofu to achieve the same uptake of nutrients. As more nutrients were added to the NDS, animal-based products tended to perform more favourably, indicating that mass-based evaluation of CF may be biased in favour of plant-based products.

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In Europe, the number of mountain farms is decreasing due to various socioeconomic drivers. Although mountain livestock farming systems are generally considered as extensive, they are actually very diverse, influenced by both internal (use of natural resources, purchased feedstuffs, farmer's age, etc.) and external factors (agricultural policy, socioeconomic context, environmental conditions, etc.). In addition, farmers need to adapt to crucial challenges that affect agriculture globally, e.g. increasing risk of droughts due to climate change and higher prices of inputs due to market dynamics. Understanding farmers' views on the relevance of actions and strategies to face these challenges is key to study mountain farming resilience. The aim of this work was to analyse: (1) farm resilience strategies according to farmer response to climate and market changes; and (2) the influence of farms and farmer characteristics on those strategies. We carried out a survey on 54 beef farmers in the central Pyrenees (Spain), gathering information about farm structure, management and economic performance. We also measured farmers' perception on the importance of different actions to deal with: (1) 2-year-long drought; and (2) rise of input prices, using a Likert scale from 1 (not important) to 5 (extremely important). Specifically, we considered actions related to pastures and feed management, reproductive management, herd size, external advice, development of quality brands, diversifying farm activity or seeking for other sources of income outside farming. According to farmers, the most relevant actions to face droughts were using new areas of pasture (average relevance of 3.4) or reducing herd size (3.3), in contrast with the lower relevance of seeking for external advice (2.4). Regarding the increase of inputs' price, the highest importance was given to using new areas of pasture (4.2) and extending the grazing season (4.2), as opposed to developing a quality brand (2.6) and seeking for external advice (2.4) that had the lowest importance. Several farm and farmer profile characteristics influenced their views on the relative importance of actions to face these challenges; e.g. farmer age, size of utilized agricultural area, or farm type (fattening on-farm or not).

Session 41. Resilient livestock farming systems in the context of climate and market uncertainties

Date: Wednesday 28 August 2019; 8.30 – 12.30
Chair: Lee

Theatre Session 41

Poster Session 41

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