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# Simulation of the economic behavior of dairy farms in low-grazing territories of the south-west (France)

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## INTRODUCTION

With a historic spike in food prices and cereal prices, followed by a milk crisis in 2009, breeders are forced to adapt to ensure the viability of their farms. Even though public policies aim to promote good environmental practices, the lack of price support, making the market very volatile, is a drag on adoption. To this economic context is added an increase in the frequency of climatic hazards, mainly due to climate change. The impacts of these phenomena can be very important on the fodder systems of cattle farms (Mosnier et al., 2010). Farmers therefore adapt by managing crises (sudden price fluctuations, droughts ...) but also by anticipating hazards. Risk management is becoming increasingly important in the breeder profession.

## PURPOSE

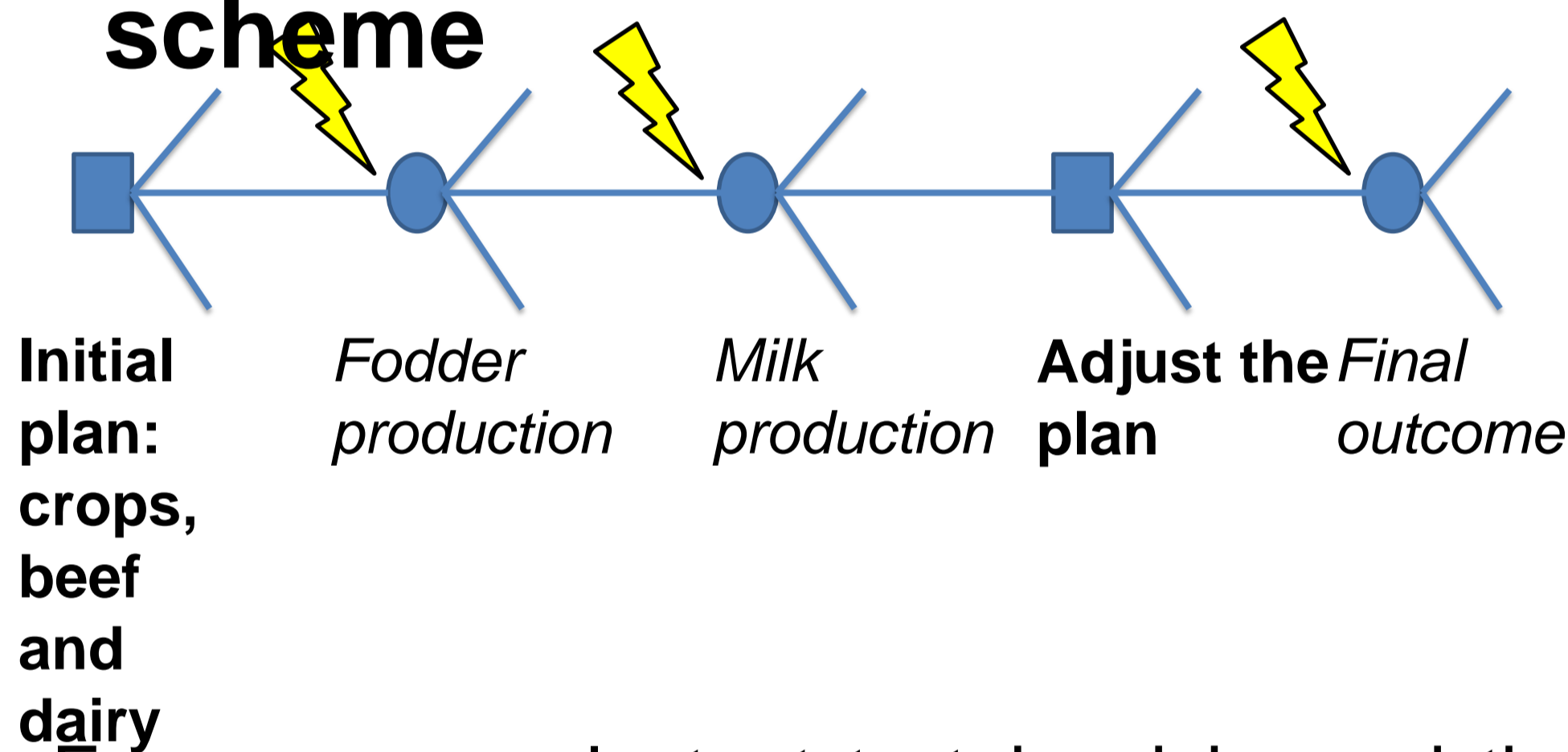
The research question is whether maintaining the grassland can reduce farmers' risk exposure.



To address this, this project proposes to understand the most common strategies and tactics used by farmers to manage risk. It also assesses the economic performance of these systems and examines the relationship between their resilience and grassland maintenance.

## METHOD AND MATERIALS

### Two-step decision scheme

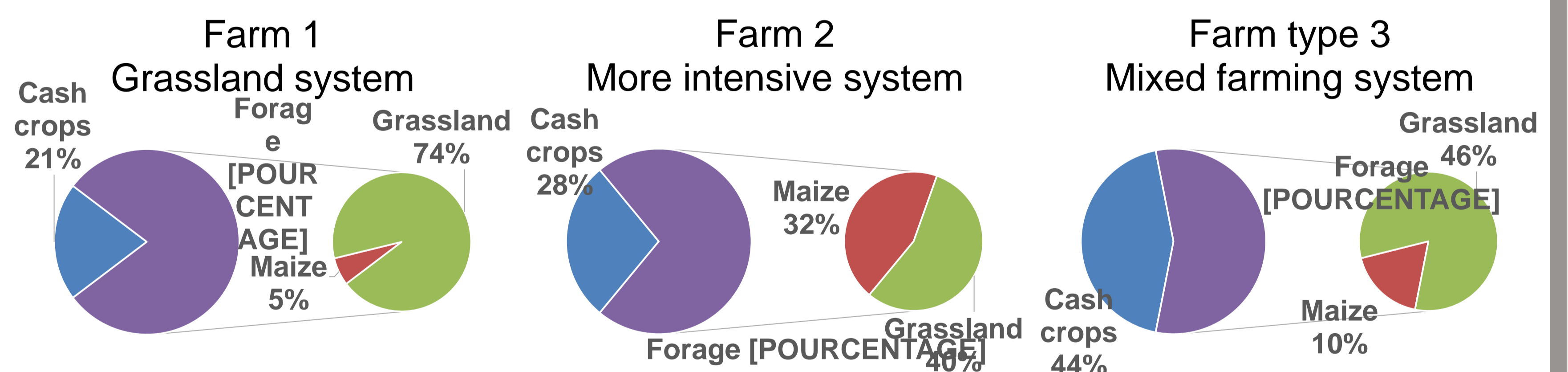


Farmers are reluctant to take risks and that the hypothesis of subjective expected utility is relevant. In this context, we assume that farmers must review their risky decision-making choices as they acquire information on the state of nature during the season.

Maximization of Subjective Expected Utility  
s.t. agronomic and zootechnical constraints

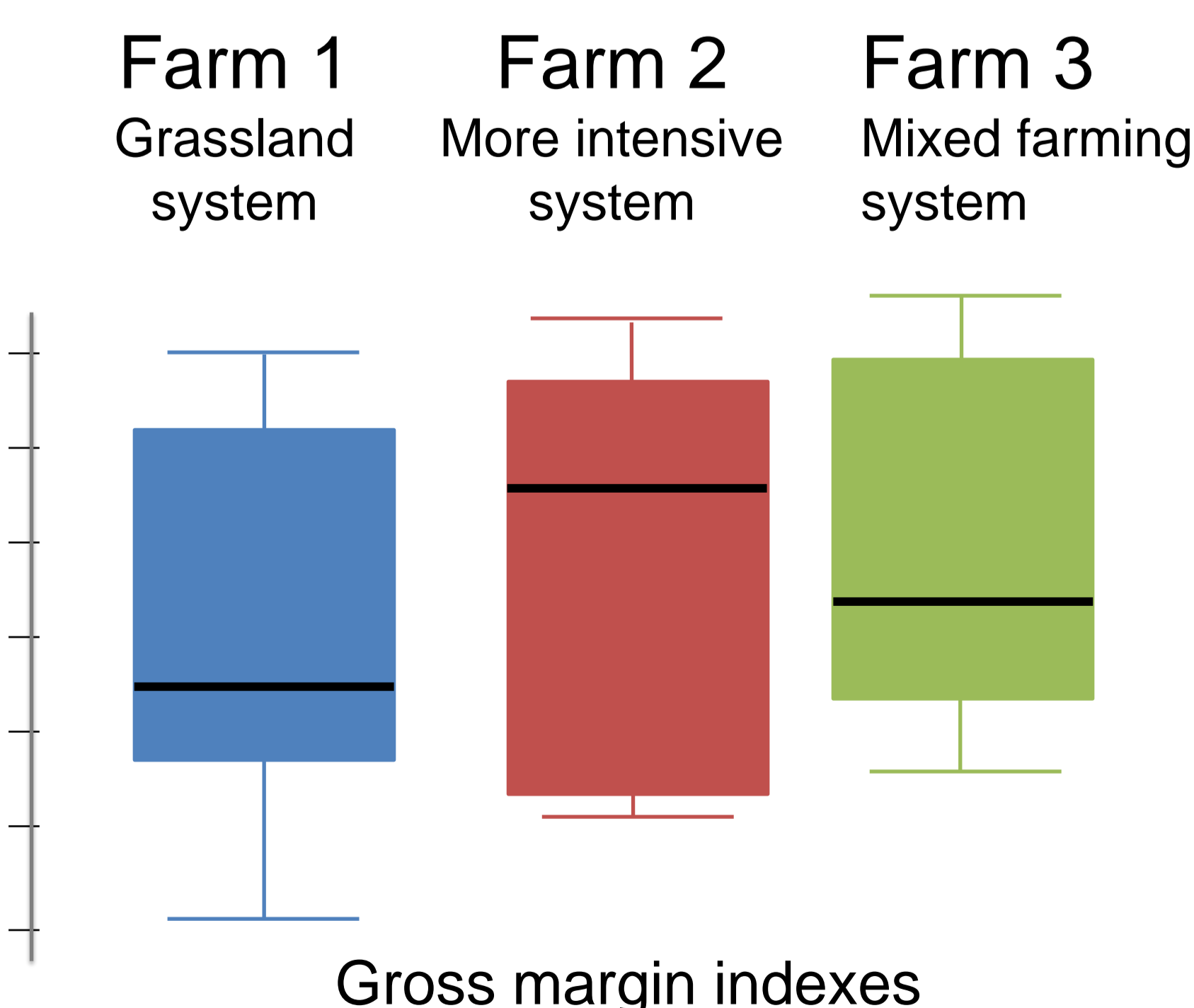
### Farm typology

In some southwestern low-grassland areas, we study the areas where the grassland areas had been maintained or even increased between 2000 and 2010. The areas identified are located on the border between the Midi-Pyrénées and Aquitaine regions. A database of 34 farms was established on the 60 holdings in the territory in 2015. After making a typology based on ratios such as the proportion of meadow area, the share of sales crops and the share of fodder area, three farms specialized in dairy production were selected (IDELE, Chambers of Agriculture and INOSYS).



## RESULTS

### Economic performance



*More intensive system* has greater flexibility in the face of medium-term uncertainties, provided that it accepts a significant variation in income. For other farms, the low gross margin level during a crisis can jeopardize the economic viability of the system.

### Tactical or strategic decisions

- Choice between two feed intake and forage diversification
- Increase or decrease in livestock
- Animals diversification
- Rotation change

## CONCLUSION

Because of its complexity, the technical nature of power management is considered only partially by the model used. It is highly likely that risk management through the maintenance of grasslands is undervalued. In any case, even if economic incentives are needed for grassland maintenance, technical support policies would enable farmers to make the most of the benefits of grassland systems for risk management.

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