

## POSITION

**Thesis proposal: Synergies and trade-offs between animal welfare and economic and environmental performances in suckler cattle farming**

## JOB ENVIRONMENT

### ■ Research unit and host team

The thesis is proposed by the Joint Research Unit on Herbivores (UMRH) of INRAE and VetAgro Sup (<https://umrhbioinfo.clermont.inrae.fr/Intranet/web/UMRH>). The PhD student will join the teams COMETE (Design, Modeling, and Evaluation of Livestock Systems) and CARAIBE (Animal Behavior, Robustness, and Integrated Approach to Welfare). The COMETE team carries out work to design herbivore-farming systems that reconcile economic and environmental performances, by valuing fodder and other resources that do not compete with human food. The CARAIBE team focuses on practices that promote animal robustness, animal welfare and health. The PhD student will benefit from the support (methods, tools, expertise) of the engineers and researchers from INRAE and the "Institut de l'Élevage" (Idele) collaborating within the Mixed Technological Unit on Services provided by the Multiperforming Suckler Systems (UMT SeSAM). He/she will be supervised by **Jean-Joseph Minviel (co-supervisor)**, **Patrick Veysset (co-supervisor)**, and **Isabelle Veissier (Supervisor HDR)**. He / she will also be supervised by **M'hand Fares, Research Director** at the Joint Research Unit on Mediterranean and Tropical Livestock Systems (UMR SELMET).

### ■ Context

Livestock farming must meet multiple goals (animal protein supply, preservation of the environment, compliance with animal welfare) while ensuring the economic viability of farms and livestock supply chains. These different goals of livestock systems are often examined separately and their interactions (synergies or trade-offs) are poorly understood. Thus, the existing literature does not provide clear references for advising breeders on how to ensure multi-performance on their farms. The competitive environment of animal production systems can encourage the development of high productivity breeding systems, without taking into account animal welfare (beyond the minimum necessary from farmers' viewpoint to ensure productivity) and / or environmental impacts. Animal welfare (including health) nevertheless appears to be a central factor in the production process and in the performance of farms. There are however trade-offs to be found between the economic and environmental aspects of farms and the optimization of animal welfare. In the presence of financial and technical constraints (e.g., input costs, infrastructure costs, workload and productivity loss), a breeder can choose production levels that do not coincide with the preservation of the environment or with high levels of animal welfare. The thesis aims to contribute to a better understanding of the links between the different aspects of breeding systems (suckler cattle) and to enrich the debates on the transition to more sustainable breeding practices. The effects of breeding practices on the multi-performance (animal welfare, technical-economic and environmental performance) of farms will be analyzed and the determinants of the interactions (synergies or trade-offs) between these components will be identified.

### Objectives

The thesis aims to answer the following research question: How can positive and negative interactions emerge between the technical, economic and environmental performance of the farm and the welfare of cattle breeding animals?

Three sub-questions will be explored:

- ❖ What practices make it possible to strengthen synergies and soften the trade-offs between the performances of livestock systems?
- ❖ What analytical framework makes it possible to consistently aggregate the indicators and analyze the determinants of the multi-performance of farms?
- ❖ What are the economic costs and benefits of a system favorable to animal welfare and the environment?

## Missions

- ❖ Searching and reviewing the literature;
- ❖ Writing bibliographical summaries ;
- ❖ Proposal of a framework for the analysis of the multi-performance of suckler cattle farms integrating animal welfare and health;
- ❖ Collecting data at the herd and farm level (animal welfare, economy, and environment) and structuring a database;
- ❖ Data analysis (statistics, operations research, econometrics) with development of original methods;
- ❖ Reporting of analysis results; synthesizing and discussing results;
- ❖ Writing scientific publications ;
- ❖ Participating in the scientific dissemination of results.

## TRAINING AND SKILLS

- ❖ Bac + 5 (Master) or equivalent degree in agricultural economics, or zootechnics / animal welfare with skills in economics. Other fields may be considered if they are relevant given the subject of the thesis;
- ❖ Interest for livestock systems;
- ❖ Interest for quantitative analyzes (statistics, econometrics, and operational research);
- ❖ Interest for field approaches;
- ❖ Writing and synthesis skills;
- ❖ Proficiency in Stata, R, and/or GAMS software;
- ❖ Organizational skills, autonomy and flexibility;
- ❖ Good level in written and spoken English.

### ↘ Reception conditions

- **Research unit** : UMR Herbivores
- **Location**: INRAE route de Theix, 63122 St Genès-Champanelle, France.
- **Type of contract** : Thesis
- **Duration** : 36 months
- **Starting date** : 01/11/2021
- **Gross salary by month** : approx. 1500€ net /month
- ✗ **Deadline for application** : 31/07/2021

### ↘ How to apply

Send a cover letter, CV, master's transcripts and Master thesis or equivalent (preferably the graduation thesis or part of it if not yet completed)

- **Jean-Joseph Minviel**

*E-mail* : [jean-joseph.minviel@inrae.fr](mailto:jean-joseph.minviel@inrae.fr)

*Phone*: + 33 (0)4 73 62 41 33

- **Isabelle Veissier**

*E-mail* : [isabelle.veissier@inrae.fr](mailto:isabelle.veissier@inrae.fr)