

Thesis offer – Modeling the knock-on effects of reducing beef cattle numbers: a comparative study of Quebec and the Massif Central region

The French National Research Institute for Agriculture, Food, and the Environment (INRAE) is a public research establishment gathering a community of 12,000 people with more than 270 units including fundamental and experimental research, spread out throughout 18 regional centres in France. Internationally, INRAE is among the top research organisations in agricultural and food sciences, plant and animal sciences, as well as in ecology and environmental science. It is the world's leading research organisation specialising in agriculture, food and the environment. Faced with a growing world population, climate change, the depletion of resources and declining biodiversity, the Institute has a major role to play in providing the knowledge base supporting the necessary acceleration of agricultural, food and environmental transitions, to address the major global challenges.

Work environment, missions and activities

You will work in the Herbivores joint research unit (UMR). The mission of this unit is to produce, integrate and disseminate knowledge, and share expertise to design multi-performing herbivore farming systems that meet the challenges of global change (environmental, socio-economic and digital transition). The unit has 118 permanent staff and welcomes 70 non-permanent staff each year. It is organized into 4 research teams, a management team and a support team.

You will work within the STARQ team (Livestock Farming Systems, Agroecological Transition, Resilience, and Product Quality). You will be enrolled at Clermont Auvergne University and attached to Doctoral School 245 in Economics, Law, Politics, and Management.

You will carry out your thesis as part of the RED-BOVIN (Resilience and Sustainability of Declining Bovine Farming Areas in a Context of Climate Change) project, a joint project funded by the French National Research Agency (ANR) and the Quebec Research Fund (FRQ), and carried out in collaboration with the VetAgro Sup engineering school, INRAE, and the Institute for Research in Agriculture and Agri-Food (IRAA) at the University of Quebec in Abitibi-Témiscamingue (UQAT).

The overall objective of this project is to identify factors that could limit the continuing decline in cattle numbers in two areas where cattle farming is central to the economy: the Massif Central in France and the boreal region of Quebec (Abitibi-Témiscamingue and Saguenay-Lac-St-Jean), by examining the interactions between the different links in the beef cattle value chain. The project will also explore options for promoting the co-evolution of these links in order to support a sustainable beef industry and regions in the face of climate and socio-economic change. Indeed, a contraction in one sector can generate negative multiplier effects on upstream and downstream activities (Miller & Blair, 2009), reduce agglomeration economies (Mosnier et al., 2010), and thus accelerate decline.

Your mission will consist of

- Developing a methodology to simulate interactions between the various links in the chain within a given territory. This methodology may involve a multi-agent model (Dolgui et al. 2018; Schiavo et al., 2025) and/or the Orfee bioeconomic farming model (Mosnier et al. 2017);
- Characterize the knock-on effects of a reduction in beef cattle numbers on upstream and downstream agricultural services and their feedback on farm performance;
- Compare two boreal livestock farming regions in Quebec (Abitibi-Témiscamingue and Saguenay-Lac-St-Jean) with the Massif Central to highlight the factors that amplify or dampen these dynamics.

Specific conditions of activity: A stay of several months in Quebec is planned.

Training and skills sought

Recommended education: Master's degree in economics, agricultural engineer with a specialization in economics

Desired knowledge: Production economics, agriculture, programming language

Desired skills: Ability to think, synthesize, analyze, and write. Ability to take initiative and question assumptions. Curiosity. Interest in modeling. Determination.

INRAE's life quality

By joining our teams, you benefit from (depending on the type of contract and its duration):

- up to 30 days of annual leave + 15 days "Reduction of Working Time" (for a full time);
- parenting support: CESU childcare, leisure services;
- skills development systems: training, career advise;
- social support: advice and listening, social assistance and loans;
- holiday and leisure services: holiday vouchers, accommodation at preferential rates;
- sports and cultural activities;
- collective catering.

Contract details

- Hosting unit name: **UMR Herbivores**
- Postal code and city workplace: **63122 St Genès Champanelle**
- Type of contract: **short term contract**
- Duration: **36 months**
- Starting date: **01/05/2026**
- Remuneration: **€2,300 gross monthly salary**

How to apply

Please send a cover letter and CV by e-mail to:

Claire MOSNIER - claire.mosnier@inrae.fr

And

Philippe JEANNEAUX - philippe.jeanneaux@vetagro-sup.fr

And

Patrice KAPDÉ - Patrice.Kpade@uqat.ca

✖ Deadline to apply: **15/02/2026**

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