

JOB ENVIRONMENT

■ Research unit

UMR1213 Herbivores is a joint research unit associating INRAE and VetAgroSup. It is situated in Theix, near Clermont-Ferrand, in the Center of France, in one of the main mountain agricultural regions in Europe. UMRH employs about 120 permanent staff and 80 temporary staff and students, and is connected with facilities in 3 locations in Auvergne (Herbipole experimental Unit). UMRH conducts research on cattle and sheep, and their production systems. The Unit has a strong expertise on digestion and CH₄ emissions, animal welfare, feeds value, and product qualities. Its work contributes to the design of sustainable farming systems for herbivores that seek to reconcile production efficiency, product quality and socio-economic viability with environmental protection and valuation, and animal welfare. Although mainly located at UMRH (Clermont-Ferrand-Theix), the work will be done in strong collaboration with other INRAE units, mainly UMR Pegase (Rennes) but also UMR MoSAR (Paris) and UMR Selmet (Montpellier).

■ Context :

The model of the INRA 2018 feeding system for ruminants (<https://doi.org/10.3920/978-90-8686-292-4>) improves the estimation of animal responses to diets and proposes new predictions. The system allows various rationing strategies to be considered by seeking compromises between different objectives, i.e. milk and meat production, management of body reserves, efficiency of protein use... (<https://www.inration-ruminal.fr/>). It also allows evaluating various other responses of the animal to the diet supplies (e.g. N and CH₄ emissions into the environment, risk of acidosis, product composition). These advances were possible for a part because the estimation of the different nutrient supplies by the diet was improved. The reference methods for estimating nutrient supply require the use of animals with permanent digestive cannulas (rumen and/or duodenum) to insert nylon bags and monitor the degradation of incubated feed ("*in sacco*" methods). With a view to stopping the use of this practice in the short term, the Alterfi project was launched by the INRAE PHASE Division.

Alternative laboratory methods are currently being developed, with the aim that they may eventually replace *in sacco* methods. At the same time, it is essential to assess the necessary degree of accuracy (or acceptable inaccuracy) on these feed value parameters to ensure sufficient accuracy in the estimation of animal responses to diets, compared to measurements on experimental facilities and/or observation on farms. This work will make it possible to assess alternatives to *in sacco* measurements in the feeding system.

Objectives and work program of the post-doctoral fellow

The post-doctoral will perform sensitivity analyses of the different animal responses to uncertainty in the estimation of feed values. He/she will have the opportunity to train (or develop his knowledge) on the INRA 2018 feeding system, including both estimation of feed values and animal's responses to diets. He will use a high throughput simulation application allowing to test the sensitivity of the model to the uncertainties on feed values, on a wide range of nutritional scenarios. He/she will develop datasets required to the tests (enter of the model), and will thus interpret the output of the simulations, in the light of measurements on experimental facilities and/or observations on farms. This will be done in strong interaction with the different researchers involved in the development of the INRA 2018 system in Theix, Rennes, Paris and Montpellier, who will share relevant databases initially used to develop the system.

The work will first be focused on dairy cows, then on beef cattle, and lastly on small ruminants. The post-doctoral will write a scientific publication based on the main results of this work.

- Website of the unit : <https://umrh-bioinfo.clermont.inrae.fr/Intranet/web/UMRH>

REQUIRED QUALIFICATIONS

Candidate skills: Experience in statistical sensitivity analysis is essential. The candidate must be able to learn the concepts of the INRA 2018 model, thus previous experience with feeding systems (preferably ruminants) would be a valuable asset. The candidate must be able to work in a network and to report on its results.

↘ Reception conditions

- Research unit : UMR Herbivores
- Location : INRAE Theix
- Type of contract : post-doc
- Duration : 18 months
- Starting date : march 2021
- Gross salary by month : 2600 €

✘ **Deadline for application : 30/01/2021**

↘ How to apply

- Send a motivation letter and CV to :

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