JOB POSITION

Engineer – Improvement of a calibration test bench for gas analysers used to assess animal housing gas emissions and tests in control conditions

INRAE presentation

The French National Research Institute for Agriculture, Food, and the Environment (INRAE, https://www.inrae.fr/en) is a public research institute. It is a community of 12,000 people with more than 200 research units and 42 experimental units located throughout France. This institute is among the world leaders in agricultural and food sciences, in plant and animal sciences, and is 11th in the world in ecology and environment. INRAE's main goal is to be a key player in the transitions necessary to address major global challenges. In the face of the increase in population, climate change, scarcity of resources and decline in biodiversity, the institute develops solutions for multiperformance agriculture, high quality food and sustainable management of resources and ecosystems.

Work environment, missions and activities

Context

You will be involved in the European project QuantiAgremi (https://www.euramet.org/research-innovation/search-research-projects/details/project/on-farm-quantification-of-ammonia-and-greenhouse-gas-emissions-from-livestock-production) and will join the INRAE Joint Research Unit "SAS" witch is located in Rennes (Brittany, France).

The project QuantiAgremi aims to improve knowledge of the measurement uncertainty associated to livestock emission measurements. It is divided in 5 work packages with complementary goals:

- Producing reference gas mixtures to calibrate measurement devices used in livestock housings.
- Improving Techniques for quantifying NH_3 and CH_4 emissions from housings and targeting an uncertainty of 10 % (CH_4) to 20 % (NH_3) for mechanically ventilated animal housing and 30 % (CH_4) to 40 % (NH_3) for naturally ventilated housing.
- Improving N_2O inventories from agricultural soils and quantifying the NH_3 footprint around livestock buildings.
- Identifying suitable sensors to measure greenhouse gas (GHG) emissions under real conditions.
- Proposing good practice guides, allowing more precise, SI-traceable, emission inventories for NH_3, GHG and air quality.

INRAE, UMR SAS (https://www6.rennes.inrae.fr/umrsas_eng/) focuses on interactions between agriculture and the environment, from the scale of a field or livestock building to that of a watershed or agricultural landscape. Agricultural systems including livestock are studied in an interdisciplinary scientific collective. The main topics focus on hydrological and biogeochemical cycles (nitrogen, carbon, phosphorus) in the water, soil and air compartments of the environment; dynamics of water and soil quality; multi-criteria evaluation of agricultural systems and the design of new systems. For

over 20 years, two scientists of SAS contribute to the development of methods to measure emissions from animal housings[1]. They will contribute to four work packages of the QuantiAgremi project.

Job description

You will be involved in the development of a calibration test bench for gas analysers and sensors used to measure NH_3, CO_2, CH_4 and N_2O concentrations inside and outside livestock housings. This activity will be conducted in collaboration with a technician and an engineer under laboratory conditions. In addition to technical developments, you will be responsible for improving the LabView control program. Once the system is up and running, you will carry out tests on various sensors and analysers used by the project partners.

You will be invited to attend work packages meetings and project meetings and to write reports and one paper at least.

Training and skills: **Master's degree/Engineering degree**

- You hold a certification of 3 years' higher education (Bac+3) with or without professional experience in metrology.
- You have good written and spoken skills in English.
- You have good experimental skills with sensors and gas techniques; you are comfortable processing large amounts of data and programming.
- You are rigorous, work independently and responsibly, but enjoy teamwork.

Conditions

The position is offered for a period of 1 year, starting the 1st of March 2023. The salary will depend on seniority (2100/2500 euros gross monthly salary).

By joining INRAE, 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.

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How to apply

Send a CV and cover letter to Mélynda Hassouna (Melynda.hassouna@inrae.fr)

[1] illustrated by the book "Measuring emissions from livestock farming" (Hassouna & Eglin, 2015; www6.inrae.fr/animal_emissions_eng/News/Book-2015-Measuring-emissions-from-livestock-farming)