UMR1348 PEGASE
Agrocampus Ouest - Saint Gilles
www.rennes.inra.fr/pegase

# Internship offer

**Title**

Study and consideration of the daily individual physical activity when estimating the energy needs of gestating sow.

**Context & Team**

Nutritional models currently used to estimate the individual requirements of gestating sows consider a unique average value of physical activity (standing time per day). This value does not take into account inter-individual variability within the herd, nor variability over the time. Thus, it could lead to an under or over-estimation of energy daily requirements and therefore of feed supplies. Indeed, the standing position requires twice as much energy as when lying down. Accelerometer sensors attached to the animal enable individual physical activity to be measured continuously and accurately, but they are expensive, fragile and have a limited lifetime. Analysing physical activity via video is a good alternative, especially if it can be automated. An algorithm is currently being developed by DILEPIX company to provide individual physical activity values thanks to video analysis.

The aim of this internship is to assess the contribution of integrating the individual activity of gestating sows from video analysis in estimating their energy requirements. First, the physical activity data outputs from DILEPIX's video analysis will be compared with accelerometer data, which will serve as a control measurement. Then, for the days during which video analysis is not available yet because it takes a lot of computing time, individual physical activity estimations will be made. Finally, simulations will be carried out to calculate nutritional requirements integrating individual daily activity. The simulations outputs (*i.e.* energy requirements) will be compared with the requirements initially estimated with a unique physical activity for all sows. This internship will be carried out at the UMR PEGASE (Saint-Gilles, Brittany, France) in the SYSMO team and will be co-supervised by Charlotte Gaillard, a researcher competent in animal nutrition, behaviour and processing of farm data, and Clément Ribas, a PhD student involved in precision feeding for sows. This internship was submitted to the call for master internship grants of #DigitAg (Institut Convergences Agriculture Numérique, https://www.hdigitag.fr/fr/ ).

**Missions**

Firstly, the intern will visualise, clean and aggregate at the daily level, available physical activity data in the aim to compare the 2 methods used to get individual physical activity (accelerometers and videos). Secondly, individual physical activity estimations will be made on days where videos analysis are not available yet, by using several exploratory methods and available video analysis. These predictions will be compared to accelerometers data available continuously during the gestation. Finally, with the help of a PhD student, simulations will be carried out with a nutritional model to estimate individual requirements by using daily individual physical activity estimated in the previous steps. The intern will compare model outputs with requirements initially assessed with a unique physical activity for all sows every day of gestation.

**Profile & level required**

Master 2 or last year of Engineering school, Skills in animal sciences, statistics and data mining ( R and/or Python)

**Supervision & person to contact**

Supervision : Charlotte Gaillard, Clément Ribas.
**TO APPLY** Send a cover letter, a CV and the last internship report to clement.ribas@inrae.fr

**Place of work & conditions**

Lieu du stage : INRAE, UMR Pegase – 16 le Clos – 35590 Saint-Gilles. On-site company restaurant.
Duration and starting date: 6 months from the 1st of January 2025. Internship compensation based on a standard rate (around 550 euros per month).