Thesis: Optimization of copper and zinc recycling from animal feeding to the soil, in pig production

Each year, about 400 million tons of organic waste are produced in France with a major contribution coming from animal production (300 million tons). The agriculture sector is now recognized as a key actor in the monitoring, production, recycling and valuation of these organic effluent that can represent considerable energy and nutrients sources (fertilizers, compost...). Nevertheless, organic waste can also pollute the environment and the soil, particularly because of the large proportion of Copper and Zinc in its composition. The mission of this thesis will be to develop a holistic approach on the management and recycling of Copper and Zinc from the farm (feeding systems) to the soil (effluent treatments).

Candidate profile: knowledge in pig nutrition, skills in mathematics (modelling), manure management is a plus!

High quality partners and conditions:

INRAE is France’s new National Research Institute for Agriculture, Food and Environment. It is a merge of the INRA and IRSTEA National Research Institute of Science and Technology for the Environment and Agriculture. INRAE’s research unit PEGASE (Physiology, Environment and Genetics for Animal and Livestock Systems) conducts research on animal biology and livestock systems with the ultimate goal of improving the sustainability and competitiveness of livestock.

**Thesis Director:** Dr. Beline Fabrice.
**Co-supervisors:** Dr. Quelen Francine, & Dr. Dourmad Jean-Yves.

Animine is a French company headquartered in Annecy, Haute Savoie. Animine supplies added-value trace minerals globally. The company is driven by important values among which scientific credibility and commitment to environmental challenges are very important. Several PhD candidates already joined the team and are continuously developing their talents in this international and welcoming structure.

**More info at:** www.animine.eu

Thesis starting date: 10/2020, for 36 months (CIFRE funding 100%)
Location: Rennes, France
Application available until June, 15th 2020