

## **Ph.D project: Foraging as a means to nutrient supply in organic pig and poultry production and its interaction with parasitic infections.**

### **Description**

In organic pig and poultry production systems the nutrient supply to the livestock is heavily dependent on cereal and oilseed crops – crops that to high degree compete with crops for human consumption. If the two livestock species are kept under semi-natural conditions, both species will seek essential parts of their feed at or below the soil surface. The degree to which such foraging behaviour can contribute to the production and how such behaviour can be utilised strategically is not well understood. At the same time endo-parasitic infections are one of the major drawbacks in free-range production systems. So, the possibilities to rely on foraging in these species rely on, how this affects the parasitic load and the capabilities of the animals to cope with the load. It is known that such interactions are influenced by the forage species as well as the animal genotype.

It's important to study this 'development possibility' from a cross-disciplinary point of view taking into account production system and animal performance as well an animal health care point of view. Such an approach has national as well as international perspective as a large proportion of the world wide pig and poultry populations are allowed foraging behaviours to a varying degree.

The outcome of such studies will thus contribute to intensification, resource conservation, and improved animal welfare.

**Aim:** The overall hypothesis is that natural foraging can yield a substantial contribution to the nutrient supply of pigs and poultry, and that systems thus can be developed, in which foraging can meet animal health concerns related to endo-parasitic infections as well as being financial competitive. Specifically it is the aim to:

- Estimate what proportion of the nutrient supply that can be met for high producing pigs and poultry, given the right conditions
- Investigate the interaction between foraging behaviour, crops used and parasitic infections
- Suggest systems that take into account animal health, productivity and recirculation of nutrients.

**Methology:** Experiments with pigs and poultry in model systems with different crops and livestock genotypes. Implementing novel techniques to estimate nutrient intake by foraging (crop dissections for poultry, maybe n-alkenes methodology in pigs). Assessment of parasitic infection levels will be performed by faecal examination for eggs or by necropsy and worm burden estimations of a few animals at regular intervals. If needed experimental infections will be performed. It will be considered to include experiments in developing countries (supervisors have close collaborative links to relevant researchers at Sokoine University of Agriculture, Tanzania and Makerere University, Uganda) as well as in Denmark.

**Scientific environment:** This PhD project will be attached to two environments: University of Aarhus, Faculty of Agricultural Sciences, Department of Agro-ecology (Farming systems group). Contact: Head of research Unit John E Hermansen.

University of Copenhagen, Det Biovidenskabelige Fakultet for Fødevarer, Veterinærmedicin og Naturressourcer, Center for Eksperimentel Parasitologi (CEP), Institut for Veterinær Patobiologi, Contact: Professor Stig Milan Thamsborg, DVM, Ph.D.