

The impact of early life programming on resistance to helminths in ruminant livestock

Supervisory team:

Main supervisor: Prof Mick Bailey (University of Bristol)

Second supervisor: Dr Laura Peachey (University of Bristol)

Dr Taro Takahashi (Rothamsted Research), Prof Andrew Dowsey (University of Bristol)

Host institution: University of Bristol

Project description:

The gut microbiome is integral to the development of a normal immune system. Disruption to the microbiome during early life – e.g. via antimicrobials, milk replacer, different diets - has long-lasting impacts on immune function in animals. This is particularly important in ruminant livestock systems, given the economic losses incurred due to infectious disease and the incremental greenhouse gas emissions accompanying them. However, little is known about how early life events impact on the microbiome and immune development in ruminants.

In this exciting PhD program the scholar will undertake a high impact research project at Bristol Vet School (BVS), in collaboration with Rothamsted Research's North Wyke Farm Platform (NWFP) system-scale grazing trial, to interrogate the role of the early-life microbiome in determining subsequent growth and immunity to helminth infection in sheep.

The scholar will first assess the impact of natural variation in early life microbiome composition and function on helminth burdens, growth and production at Wyndhurst Farm (BVS) and Rothamsted Research's NWFP. They will then evaluate the impact of microbiome modulatory interventions (e.g. antibiotics and probiotics) on the same performance parameters in a subset of animals. The naturally acquired immune response to helminth infection will be closely monitored during this period.

This research will address key questions with regards to the power of microbiomes to influence growth and immunity in small ruminants. The scholar will benefit from a strong interdisciplinary supervisory team lead by Professor Mick Bailey at BVS; including Dr Laura Peachey (Microbiome), Dr Taro Takahashi (Agricultural production) and Prof Andrew Dowsey (Data Science).