Deriving social networks in cattle and their relation to health and sustainability

Supervisory team:
Main supervisor: Prof Andrew Dowsey (University of Bristol)
Second supervisor: Dr Suzanne Held (University of Bristol)

Collaborators: Prof Michael Lee (Rothamsted Research), Dr Jordana Rivero-Viera (Rothamsted Research)

Host institution: University of Bristol

Project description:
A growing population and climate change are stressing the availability of food worldwide. At the same time, high animal welfare and health practice is more important than ever to satisfy societal demands for the livestock sector. The use of precision monitoring instrumentation for dairy cattle, including wearables sensing activity levels and precise measurement of individual feed intake and milk quality, has become increasingly adopted to optimise production while maintaining animal health. Through a grant from the John Oldacre Foundation the University of Bristol has invested in comprehensive monitoring infrastructure for its dairy farm, including blanket video coverage, research wearables, real-time environmental monitoring of weather and emissions, and controlled feeding and production analytics. The aim of this Centre is to realise an open research data platform on the our intensively monitored cohort of dairy cattle so that the field can advance its understanding of what constitutes and predicts animal resilience and provide key advancements in the basic sciences of cognition and behaviour that will lead to improved welfare practice.

How animals aggregate and interact with each other affects their health, welfare and productivity and, in turn, is affected by them. Social associations and the wider networks resulting from them thus hold information on key aspects of sustainable animal production. This PhD project is aimed at understanding these relationships in cattle. It will use the real-time positional data from our intensive dairy and extensive beef cohorts to first derive social interactions and networks. This will then enable analysis of (i) how these social patterns affect and are affected by health status, and (ii) how they affect our ability to detect early disease signs and sustainability issues (low productivity and high emissions).

The studentship will be based in Prof Andrew Dowsey's and Dr Suzanne Held's groups in the Department of Population Health Sciences and Bristol Veterinary School, benefiting from the mass of researchers integrating disparate health, production and behaviour data. The student will also benefit from a rich collaboration with Prof Michael Lee and Dr Jordana Rivero at Rothamsted Research's Farm Platform at North Wyke, a BBSRC National Capability, who will provide expertise on sustainable food security and grazing livestock systems.