PhD Studentship - The impacts of parasitism on greenhouse gas emissions in livestock

It is widely recognised that greenhouse gases (GHGs) are a major contributor to climate change, and livestock are responsible for more GHG emissions than all other food sources. With global commitments to tackle drivers of climate change, animal health and productivity are priority targets for mitigating emissions at the national and international level.

It is known that common livestock parasites affect productivity and growth, however the impacts of parasitism on GHG emissions are currently unknown. Understanding the true environmental costs of parasitism in livestock will reveal the potential benefits of mitigating emissions through controlling parasite burdens.

Our pilot study has revealed that ubiquitous parasites of lambs (gastrointestinal nematodes) can drive a 33% increase in methane yield per kg of dry matter intake. This study is the first to empirically demonstrate disease-driven increases in methane yields in livestock. This studentship would build on this significant result, and quantify the impacts of parasitism on emissions from meat production.

This studentship will explore the impacts of parasitism on GHG emissions by working at the interface between the latest modelling techniques and applied disease systems. It will combine direct measurements of methane yield over the course of infection (using SRUCs on-farm respiration chambers) with mathematical modelling that accounts for disease dynamics and livestock productivity (developed with Biomathematics and Statistics Scotland, and the University of Edinburgh's Global Academy of Agriculture and Food Security). By capturing how infection dynamics alter varying aspects of host physiology and behaviour, this will allow a step change in understanding how infection affects GHG emissions in grazing livestock enabling effective mitigation strategies.

The student will be registered at the University of Edinburgh's (UoE) Global Academy of Agriculture and Food Security, and will work within the Disease Systems Team at SRUC. Agricultural and veterinary research at SRUC and the University of Edinburgh (UoE) has been ranked as the most powerful in the UK in the Research Excellence Framework (REF). The student will also be part of Biomathematics and Statistics Scotland (BioSS). BioSS is one of the Main Research Providers for strategic research in environmental, agricultural and biological science funded by the Scottish Government. BioSS has an international reputation for its research and consultancy activities, bridging the gap between the development and application of biomathematics and statistics.

By working with SRUC, BioSS and UoE Global Academy, this studentship will provide expertise and training in practical, computational and analytical techniques. This will prepare the student to address the multidisciplinary challenges of environmental change, animal health, and future food security.

This project will suit either i) a candidate with a biological, environmental or veterinary background, with strong quantitative and computational skills and an interest in modelling disease systems, or ii) a candidate with an applied numerical/computational background keen to develop practical research skills.

In addition to strong quantitative and practical skills (with a 2:1 or higher in a relevant discipline), candidates should be able to demonstrate the ability to communicate research both at a general level and to scientists from a range of disciplines. It is expected that the successful candidates will foster strong links across all of the research groups involved, and they will present their work at national and international conferences as well as attending workshops and summer schools.

The stipend will be set at UKRI recommended levels for a 3.5 year-period and the studentship is funded to pay domestic tuition fee levels for UK/EU students. The student will receive an annual student stipend of £14,777 (£15,009 in 2019/20). This studentship will fund to pay the tuition fees at home fees rate only. International students must provide evidence of sufficient funds to cover the higher international student tuition fee level (approximately £16,740 per year would be required).

To apply for this studentship, please complete the application and equal opportunities monitoring forms available at:
https://atsv7.wcn.co.uk/search_engine/jobs.cgi?owner=5062827&ownertype=fair&jcode=1793450&vt_template=1423&adminview=1

Completed forms and any questions should be sent to SRUC's Postgraduate Administrator pg.research@sruc.ac.uk quoting reference SRUC/2019-11/Fox.

CVs will not be accepted without a completed application form. If English is not an applicant's first language, an approved English language certificate may be required – see further particulars for more details.

To have an informal discussion about this studentship, contact Mike Hutchings (Mike.Hutchings@sruc.ac.uk), Naomi Fox (Naomi.Fox@sruc.ac.uk), or Glenn Marion (glenn.marion@bioss.ac.uk)

The closing date for applications is 5pm on 3rd March 2019