## Reducing Antibiotic Resistance on Dairy Farms

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**Project description:**
Farming has been identified as a potential source of antimicrobial resistant (AMR) bacteria or AMR genes that may impact human health. Whether this is a genuine threat or not, UK farmers are keen to reduce the prevalence of AMR bacteria, particularly bacteria carrying transferable resistance to critically important antimicrobials.

On dairy farms, the prevalence of AMR bacteria is generally low. We hypothesise that one barrier to reducing AMR still further is the recycling of AMR caused when replacement heifers (born on the farm) enter the milking herd. Reducing the colonisation of these replacement heifers with AMR bacteria at birth and in the neonatal environment may therefore be important for the success of measures specifically designed to reduce AMR carriage in dairy cows. In addition, as our current understanding of potential drivers of AMR on dairy farms broadens, other suitable points for intervention aimed at reducing AMR may be identified that are interesting for future work.

This project will take a mixed-methods approach to the specific management and microbiological risk factors associated with the cycling and selection of AMR bacteria on dairy farms. On-farm work will allow observation of farm practices and detailed sample collection. In the lab, samples will be processed to yield bacteria which will be phenotypically tested for AMR. In silico, AMR mechanisms and bacterial types identified by whole genome sequencing will be used to define transmission dynamics. Multivariable, multilevel regression modelling approaches will be used to identify risk factors for AMR transmission and selection.

The project would suit someone with a detailed knowledge of farming and a desire to learn laboratory and computer-based analysis, as well as undertake fieldwork. A veterinary degree is not essential. We would expect students to divide their time between Bristol Veterinary School at Langford and the School of Cellular & Molecular Medicine in Clifton, Bristol.

Potential applicants interested in further information are encouraged to contact Professor Matthew Avison at bimba@bristol.ac.uk or Dr Kristen Reyher at kristen.reyher@bristol.ac.uk

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