Antimicrobial resistance (AMR) research at Bristol Vet School

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Antimicrobial resistance (AMR) research at Bristol Veterinary School is promoted and facilitated by the AMR Force, initiated and led by Kristen Reyher. We work both in the South West, nationally and internationally, and are interested in decreasing antibiotic use while improving animal health through a plurality of approaches addressing differing styles and attitudes.

Current Main Projects

Our Milk Our Meds

This project focusses on reducing antibiotic use on UK dairy farms through farmer learning groups. It is sponsored by AHDB Dairy and The Langford Trust, a local charity for animal health and welfare.

We are:

- Using 'Stable Schools', an approach widely used in Europe, with UK dairy farmers across the South West, to promote a "bottom-up" approach
- Establishing several groups of farmers meeting at regular intervals over 1-2 years to discuss, challenge and thrash out on-farm strategies to reduce and rationalise antibiotic use
- Monitoring on-farm medicine use and benchmarking farmers against one another

The overall aim will be to use the outcomes from these groups to inform policy and advise leading bodies on how to tackle the global problem of AMR, revealing strategies that will work best on UK dairy farms.

Medicine Use in Dairy

This important study is looking to understand better how medicines are used on dairy farms, by dairy farmers. This project is funded by The Langford Trust.

We are:

- Studying how veterinary medicines are used and recorded on dairy farms in South West England and South Wales
- Aiming to provide better and more efficient ways of recording and estimating medicine use in the dairy sector
- Aiming for a better understanding of why and how medicines are used on farms

OH-STAR - One Health Selection and Transmission of AMR

We are investigating AMR in the environment, animals and people, looking at how AMR is acquired and how it is spread.

The overall aim of OH-STAR is to identify whether transmission of AMR from animals to people is a significant risk when compared to that resulting from antimicrobial prescribing in human medicine.

In this £1.5M cross-council UK Research Council-funded project we are asking:

- What drives acquisition of AMR in farmed and companion animals?
- Do AMR bacteria encountered by animals in the environment influence the AMR bacteria in their faeces?
- Does early life antimicrobial use play a part in selection of AMR bacteria in animals?
- Does reducing antimicrobial use in dairy cows reduce AMR in the near-farm environment?
- Do leisure activities in contaminated near-farm environments influence the abundance of AMR bacteria in dogs, which might be brought into the home?
- Is there a link between AMR in humans with living close to a farm or with AMR in dogs exposed to near-farm environments?

This study will provide much needed data about management changes that might reduce AMR in animals and in humans.

DIAL - Diagnostic innovation and livestock: towards more effective and sustainable applications of antibiotics in livestock farming

Along with Exeter and Edinburgh Universities we are examining the question "What needs to be in place to develop better conditions for a diagnostic-led approach to animal care and treatment?" This is a £1.75M cross-council UK Research Council-funded project.

In this multi-disciplinary project we are:

- Assessing current diagnostic and treatment decision practices in the UK
- Generating understanding of the current development of, market for, and regulation of new and innovative diagnostic tools and technologies
- Working with veterinarians, diagnostic developers, farmer and regulators to identify pathways and possibilities for improved diagnostic practice
- Working with partner veterinary practices to trial new diagnostic tools on a series of farms.
- Conducting pilot and capacity-building research in Tanzania
- Evaluating the implications trialled innovations
- Identifying the changes in behaviour, practice and knowledge necessary for adoption of effective innovative practices
- Developing detailed strategies for the improved use of diagnostic tools and practices

A livestock research data platform for One Health AMR research

The need for a comprehensive and accessible data collection for AMR research in the animal realms is rapidly expanding and is critical to addressing looming questions about AMR in the animal and human realms worldwide. This project is providing a step-change in utility, access and scope for AMR data. The research data platform currently contains multi-layered data, including epidemiological data from farms on farm-level management factors and antimicrobial use, animal-level characteristics and individual antimicrobial treatments, microbiological culture and sensitivity information from farm-level environmental samples and animal-level faecal samples, as well as whole genome sequence data for cultured bacteria.

- This flexible databank allows an increase in coverage and scope of data from microbiological, epidemiological and practical data collection initiatives that could be stored and linked.
- The resulting integrated, mineable, and easily extensible database platform enables numerous original epidemiological analyses and improve accessibility and transparency of the data.
- Such an infrastructure will allow detailed monitoring and analysis of livestock systems at different levels (farm, producer, county) and from all aspects (farmer, veterinarian, industry), which is not currently possible.

Collaborations with major livestock veterinary practices, milk processors and retailer supermarkets across the UK are underway, and linkage to their data is imminently required to allow researchers to characterise correlations between antimicrobial use and the presence of AMR on farms, and evaluate associated risk factors for AMR on farms.