

Impact Objectives

- Explore the evolving responsibilities of UK corporate food retailers in tackling antimicrobial resistance (AMR) in their meat supply networks
- Facilitate increased dialogue and collaboration between food retailers and wider institutional policy and scientific networks in the UK to shape future strategy
- Evaluate current and evolving corporate retail antibiotic stewardship strategies and standards in meat supply networks

Antimicrobial resistance in the food chain

Working with a cross-disciplinary, multi-institutional team, Professor Alex Hughes and Dr Suzanne Hocknell from Newcastle University, together with Dr Emma Roe from the University of Southampton discuss the role of UK supermarkets in addressing antimicrobial resistance in food supply chains



Professor Alex Hughes



Dr Suzanne Hocknell



Dr Emma Roe

What is antimicrobial resistance and why is it important?

Antimicrobial resistance (AMR) is one of the world's most rapidly growing challenges and is one of the top five priorities for the World Health Organization (WHO). If left unaddressed, the 2016 O'Neill report on *Tackling Drug-Resistant Infections Globally* predicts that 10 million lives will be at risk from AMR per year within the next three decades.

Growing evidence of AMR developing from veterinary antibiotic over-use is raising questions about their continued utility in animals or humans. Consequently, some antibiotics vital for human health have been classified by the WHO and the European Medicines Agency (EMA) as Critically Important Antimicrobials (CIAs), thereby restricting their use. AMR microbes also pose a small risk of direct transfer to humans through handling farm animals, their carcasses, or eating their meat.

How much do existing farming practices contribute to AMR?

order to meet increased consumer demand for animal products. Whilst antimicrobials are an important tool in supporting animal health and welfare on farms, the key issue is that their inappropriate use threatens their future utility in treating human and animal diseases. Thus, the threat to humans potentially impacts on food security as well as health.

Can you tell us about the project contributors?

SH: I am a geographer with an interest in human – non-human relations, based at Newcastle University. I am a post-doctoral research associate and have conducted desk-based research, interviews and qualitative data analysis for the project.

ER: I am a co-investigator on this project, with specialism in agro-food networks. I have been involved in qualitative data analysis and have contributed expertise in the field of farm animal welfare and food animal production.

AH: I am Principal Investigator on the project, with specialism in supply chains, and have been involved in the overall design of the research and its objectives, the interview

questions, interviews and the focus of the analysis.

Co-Investigators Professors Neil Wrigley (Geography) and Michelle Lowe (Management), University of Southampton, advised on the influence of corporate retail structures on food sourcing patterns. Co-Investigator Professor William Keevil (Microbiology, University of Southampton) provided expertise concerning foodborne pathogens and AMR transmission.

The project also involved scoping interviews with a small sample of pig and poultry farms. These were conducted by Charles Scott at Newcastle University and the Farm Business Survey.

Our Project Partner is the Food Standards Agency, represented by Director of Policy, Steve Wearne, and Professor Guy Poppy, Chief Scientific Adviser. The project's Advisory Board includes Professor Tom Reardon, Michigan State University, providing expertise in global food transitions, Dr Carmen Hubbard, Newcastle University, with expertise in food supply chains and agriculture, the Veterinary Medicines Directorate, with Fraser Broadfoot and Ana Vidal and Professor Tim Leighton of the Network for Anti-Microbial Resistance and Infection Prevention (NAMRIP) at the University of Southampton. NAMRIP is an interdisciplinary group of researchers spanning science, engineering, medicine and social science to tackle AMR through research and engagement activities. ►



The microbial threat

A cross-institutional, multi-disciplinary team has been investigating the key role that large corporate retailers have in tackling the issues surrounding antimicrobial resistance (AMR) in the UK food supply chain

The 'Corporate Food Retailers, Meat Supply Chains and the Responsibilities of Tackling Antimicrobial Resistance' project, led by Principal Investigator Professor Alex Hughes of Newcastle University, seeks to explore the role of UK supermarket groups in tackling the issues surrounding antimicrobial resistance in the food supply chain. Supported by funding from the Economic and Social Research Council (ESRC) and the Veterinary Medicines Directorate (VMD) as part of the cross-council programme on 'Tackling Antimicrobial Resistance', this multi-disciplinary, cross-institutional team brings together a wealth of expertise to analyse this vital issue.

The emergence of AMR, with its attendant threat to human health, animal health and food security, has led to pressure for stewardship programmes within a One Health agenda that brings together work on animal health and welfare, biosecurity, diagnostics, biosecurity, antibiotic prescription and surveillance.

THE PROJECT'S APPROACH

While much of the existing academic and policy research on AMR within the food industry focuses on government- or individual producer-level policy, this fails to reflect the overall picture of global food system influences such as corporate social responsibility. 'We focus on the ways in which influential bodies in the food system, particularly supermarket chains and food processors, are playing roles in addressing AMR in their food supply chains, predominantly through the incorporation of programmes and standards of antimicrobial stewardship,' explains Hughes.

This project deepens our understanding of the challenges faced by the meat supply network and will be used to inform academics, industry and government agencies in the formation of policy as well as academic research. The project explores the responsibilities and actions of UK food retailers in addressing the AMR challenge; facilitates improved collaboration between retailers, other industry players and the policy and research networks;

evaluates existing strategies centred on tackling AMR and considers the potential influence of consumers on efforts undertaken to address this issue.

The team has combined in-depth interviews with retailers and a range of meat supply organisations with desk-based research. Extensive reviews of publicly-available international, governmental and industry AMR pork and poultry supply network guidelines and policies were undertaken, together with analyses of AMR coverage in the UK media and the creation of dynamic maps that explore AMR within meat supply chains. UK retail purchase, UK supply network and antimicrobial resistance levels in supplying countries were plotted together with the average local level of antibiotic usage.

The interviews with retailers were complemented by interviews with farmers and meat processors, plus organisations involved in the development, implementation and monitoring of the AMR policies across major UK food retailers, trade bodies and the public sector.

CORPORATE SOCIAL RESPONSIBILITY

State institutions at international, regional and national levels have proven key in harmonising antimicrobial stewardship practices through the development of relevant policies and legislation. Hughes advises that, 'A drive at an international level to tackle AMR is reflected in the tripartite collaboration between the WHO, the United Nations' Food and Agricultural Organization (FAO) and the World Organization for Animal Health (OIE), which in turn informs national-level policies.' Both the UK government and the EU have devised strategies that include the '2013-18 Five-Year Antimicrobial Resistance Strategy' as well as funding research groups such as this to address this vital topic. 'In addition to the role of government, non-governmental organisations such as RUMA (Responsible Use of Medicines in Agriculture Alliance) complement government strategies by informing and influencing best practice use and reduction of antimicrobials,' elaborates

Hughes, 'while the Red Tractor farm and food safety assurance scheme includes standards for responsible use of antimicrobials.

Industry associations in specific sectors, such as the British Poultry Council and the National Pig Association, are also informing standards and best practice for antimicrobial use in agricultural production.'

However, she notes that, 'it is important to address the ways in which influential retail and processing corporations are responding to government, scientific and civil society calls to address AMR.' With a relatively-small number of companies dominating the processing and retail aspects of the food supply chain, 'it is imperative to understand how these companies are internalising these calls, how they are developing strategies for improved antimicrobial stewardship and how those strategies are being implemented,' states Hughes. It is vital that any study into the role of the food supply chain on AMR considers the global, regional and national policies tackling the issue and also seeks to clarify the influence of supermarkets and food processing companies on the situation.

Furthermore, the role of corporate food retailers and the customers who motivate their decision- and policy-making, may provide critical insights into the global challenge relating to the use of antimicrobials in farming and supply chain practices that has arisen in response to growing consumer demand for animal-derived products.

STUDY LIMITATIONS

The investigation incorporated two case studies on pork and poultry meat supply and while these highlighted well-publicised examples of antimicrobial stewardship, offering useful quantities of pertinent data, their integrated supply chains have different challenges and opportunities to those of other livestock sectors, most pertinently beef and dairy cattle.

The project interviews primarily focused on existing policies relating to AMR and



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the implementation of these policies in relation to antimicrobial stewardship. The main drawback in this approach is that: 'This tended to side-line aspects of AMR transmission and its challenges beyond the farm,' explains Hughes.

FOCUS ON THE FUTURE

Hughes and her team believe that: 'The key focus of strategies used to date by those involved in the food supply chain to help manage AMR has been on the responsible use and reduction of antimicrobials in farm animal production as part of wider animal health and welfare policies. In particular, this has involved quickly meeting the targets of reducing antibiotic use generally and CIAs specifically, in farmed fish and livestock.'

The persistence of AMR does not have a linear relationship with antibiotic use and

therefore, 'Areas for future strategic focus include addressing AMR transmission via environmental reservoirs such as wastewater and soils in addition to considering global pipelines for AMR in international trade and the risks of AMR transmission in processed as well as fresh food,' concludes Hughes. Collaboration between corporations, as well as support from government, trade associations and non-governmental organisations, which has been so central to success in programmes of antimicrobial stewardship to date, will be key to addressing these challenges in the future.

The key findings from the project from the final analysis of the data collected between February 2017 and October 2018 were presented at an end-of-project workshop on the 19th of November 2018 at the British Academy in London, UK. ●

Project Insights

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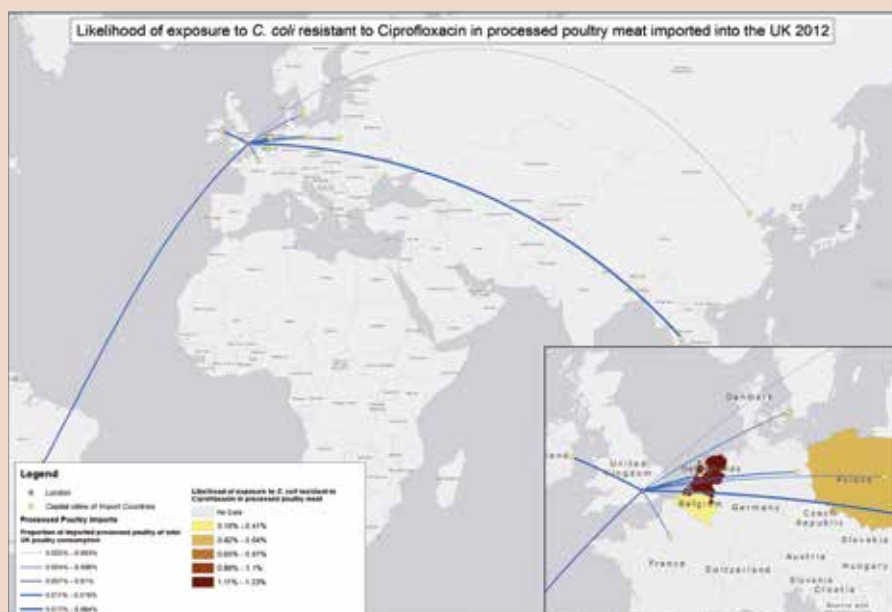
W: <https://www.southampton.ac.uk/namrip/research/behaviour-in-the-wider-world/meat-in-food-chain.page>

BIOS

Professor Alex Hughes is Professor of Economic Geography in the School of Geography, Politics and Sociology at Newcastle University. Her research interests lie in the field of global supply chains and issues of power, responsibility and governance. She has conducted numerous studies over the past 20 years, funded by the Nuffield Foundation, the Leverhulme Trust, the British Academy, the Newton Fund and the Economic and Social Research Council.

Dr Emma Roe is Associate Professor in Human Geography in the School of Geography and Environmental Sciences at the University of Southampton. She specialises in agro-food cultures, economies and politics, frequently working in transdisciplinary research teams.

Dr Suzanne Hocknell is a research associate in the School of Geography, Politics and Sociology at Newcastle University. Her research interests include developing innovative and ethnographic methodological approaches that ground wider theoretical debates in situated relationships and performances.



Mapping AMR risk in meat supply chains