

Title: Intervention of antimicrobial resistance transfer into the food chain

Acronym: INART

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Consortium composition

Type: C – coordinator P - participant	Name	Institute	Country
C	Walsh, Fiona	Maynooth University, Biology	Ireland
P	Edward Topp	University of Western Ontario, Biology	Canada
P	Magdalena Popowska	Department of Applied Microbiology, Institute of Microbiology, Faculty of Biology, University of Warsaw	Poland
P	Eddie Cytryn	Department of Soil, Water and Environmental Sciences, Agriculture Research Organization Volcani Center	Israel
P	David Drissner	Albstadt-Sigmaringen University	Germany
P	Fiona Brennan	Soil and Environmental Microbiology Research group Teagasc, Environmental Research Centre	Ireland
P	Xavier Sidler	University of Zürich	Switzerland

Abstract

Soil and water have been identified as reservoirs of antimicrobial resistance (AMR) and the food chain as the most likely mode of AMR transfer into human and animal pathogens. Manure is reused as soil fertiliser in which food plants grow and is a source of AMR. We hypothesise that pre-treatment of manure will reduce and remove the abundance and diversity of AMR genes and pathogenic bacteria of high priority from entering the food chain. Alleviating AMR elements from entering the food chain will reduce the transfer and uptake of mobile AMR genes and pathogens by human and animals. This project will focus on chicken and pig manure as both have been demonstrated to carry a wide variety and abundance of mobile AMR genes of clinical relevance. Our intervention is to pre-treat the manure in order to reduce or remove the burden of AMR in the manure prior to reuse as fertiliser. The microbiomes of chicken and pig manure differ, but the AMR genes and mobile elements overlap. Our study will investigate if the same pre-treatments will reduce or remove AMR prior to application and if these reductions or removal are maintained on the food plants or grass, and in the soil. We will also identify the main microbiome changes mediated by the intervention and analyse if these bacterial changes are important in the mitigation of AMR. Reducing or removing the threat of AMR at the start of the food chain will reduce the potential for selection and transfer of such AMR genes and pathogens further along the food chain. By stopping or reducing the continuous transfer of AMR genes and mobile elements along the food chain we will reduce the burden of AMR in pathogenic bacteria.