

Interventions to control the dynamics of antimicrobial resistance from chickens through the environment (ENVIRE)



TUNISIA



Project sector
One Health



JPIAMR partners
Freie Universität

French Agency for
Food, Environmental
and Occupational
Health & Safety

Veterinary Academy
of Lithuanian
University of Health
Sciences

Wrocław University
of Environmental and
Life Sciences

Leibniz Institute
for Agricultural
Engineering and
Bioeconomy



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270,320 EURO



INTERNATIONAL
CENTRE FOR
**ANTIMICROBIAL
RESISTANCE
SOLUTIONS**

Context

Poultry meat has seen an explosive increase in recent decades as a means to provide affordable protein. Due to the increased demand for poultry, this has led to the development of industrial-sized poultry farms globally. In these farms, antimicrobials are used prophylactically, peri-prophylactically, as growth promoters and therapeutically. This leads to unnecessary overuse of antimicrobials in the poultry themselves and results in environmental contamination from these antimicrobials (and therefore antibiotic residues), mostly in the effluents of these farms. The overall ENVIRE consortium will aim to address the reduction of AMR in chickens and in the environment of chicken farms in Europe and Tunisia.

Problem

The development of AMR in poultry populations, the environment and ultimately in humans is encouraged through:

1. High level of unnecessary antimicrobial use in farmed poultry for both prophylactic, peri-prophylactic, growth promotion and therapeutic use
2. High level of contamination in industrial and farm effluents with antibiotic residue

"Fighting antibiotic resistance comes in small steps that should be strategic, orderly and well thought out. Well within the one health concept, our interventions start on the consumer's table and ends in the environment. We are confident that with the solution we offer we can have an impact in the fight against antimicrobial resistance."

**Wejdene Mansour, Associate Professor,
Faculty of Medicine Ibn Al Jazzar**



Project overview

The project will investigate possible interventions to reduce selection and spread of AMR from chicken production and the environment and ultimately to humans via foodborne, occupation and environmental routes.

The project aims to reduce antimicrobial use in poultry through the introduction of plantbased therapy (phytotherapy) with thyme and/or lavender. This part of the project will both undertake a lab-based and farm-based approach and explore whether phytotherapy leads to changes and/or reductions in the resistance profiles of bacteria colonising poultry populations.

The second part of the project will explore the use of an adsorbent bio-derived polymer as a novel technology to reduce the contamination of antibiotic residues in effluents. This part of the project will take place exclusively in the laboratory. However, the adsorbent will be tested first using artificially contaminated water and thereafter with water taken from two industrial poultry farms.

Outcomes

- Improved therapeutic model for chickens with colibacillosis using medicinal plants as integrated in the poultry feed
- Proven model of treatment of farm effluents
- Dissemination of the above solutions to engage with stakeholders (including farmers) and policy makers associated with dysbiosis, which include enhanced susceptibility to pathogen infection

Results

Poster on ENVIRE Project (Interventions to control the dynamics of antimicrobial resistance from chickens through the environment) at 9th Symposium on Antimicrobial Resistance in Animals and the Environment - 3-5 July 2023, Tours, France. The study investigates the presence of multidrug-resistant bacteria in the KAMECH catchment area's deep water ecosystem. It found 52 bacteria in 100 samples, with notable presence of β -lactam-resistant strains and genes like blaNDM and blaCTX-M15. The dissemination of these bacteria poses significant risks to human, animal, and environmental health.

