**Title**: Quantification of human exposure to antimicrobial resistant *E. coli* using a farm-to-fork model in broiler chicken production.

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**Abstract**: AMR, or antimicrobial resistance, is a pressing global health concern, where microorganisms resist to antimicrobial agents, posing significant threats. The ENVIRE consortium, part of the European transnational programme “One Health interventions to prevent or reduce the development and transmission of antimicrobial resistance” (JPIAMR-ACTION), addresses AMR in broiler chickens and its transmission to humans via the environment. Led by Germany, the consortium includes partners from Europe and the Mediterranean, including France, Lithuania, Poland, and Tunisia.

A key aspect of ENVIRE is developing a quantitative microbial risk assessment (QMRA) model to assess intervention strategies' effectiveness in reducing human exposure via foodborne, occupational, and environmental pathways. This model relies on existing literature and experimental data from ENVIRE consortium partners.

The presentation will delve into the farm-to-fork QMRA model (refer to Figure 1), which functions as a stochastic simulator capturing the dynamics of AMR transmission in broiler production. This model integrates exposure assessment from the farm level across multiple production phases, encompassing slaughter, processing, transport, cooking, and eventual consumption. Its objective is to calculate the consumer's risk of exposure to extended spectrum beta-lactamase-producing E. coli bacteria. At the farm level, the model incorporates recent research findings (Becker et al., 2020; Dame-korevaar et al., 2019) and employs a compartmental SI model to simulate AMR transmission, estimating prevalence and concentration of bacteria in the barn environment pre-harvest. These outputs feed into the subsequent foodborne module of the QMRA model, based on a model proposed by Collineau et al. (2020), which conducts Monte Carlo simulations tracking bacterial evolution through production steps like scalding, defeathering, evisceration, washing, chilling, portioning, and up to consumption through cooking. The integration of the farm-to-fork continuum in the baseline scenario is evaluated against various intervention strategies using data from different partners of the ENVIRE project. This underscores ENVIRE's innovative approach to addressing this critical global health challenge.

Farm module

Foodborne module

Slaughter

Meat consumption

Processing

Home Preparation

Risk of exposure

**Figure 1:** Farm to fork module

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