THE RISK OF ANTIMICROBIAL RESISTANCE FROM LOW-LEVEL ANTIBIOTIC EXPOSURE IN DIET

Friday, 9th September - 10:45: Poster Session - Abstract ID: 119

Mr. Jegak Seo (University College London), Dr. Frank Kloprogge (University College London), Prof. Andrew Frank (University College London), Dr. Lena Ciric (University College London)

A wide range of antibiotics have been widely used in the rearing of agricultural animals. While the use of these antibiotics has been reported as extensive, extremely limited information is available on the antibiotic residues in animal products and the adverse impact consistent low levels of antibiotics might have on the human body as well as its microbiome. The aim of this study was to estimate the possible antibiotic concentrations exposed to humans via diets using the concentration of antibiotics in animal products and water, and online survey data on dietary habits. In the present study, target antibiotics were extracted from food and water using the Low-Temperature Partitioning Extraction (LTPE) method and measured by Liquid Chromatography-Mass Spectrometer (LC-MS). The dietary habits of 51 participants were investigated via online survey using UCL Opinio. Triplicates of 34 foods and drink products including beef, chicken, pork, fish, dairy, and water were analysed to detect and measure the concentrations of ten target antibiotics. The dietary habits and antibiotic concentration data were then combined into three different exposure scenarios including maximum, median, and minimum. The dietary antibiotic exposure was predicted by applying the concentrations to the scenario-based consumption amounts. The majority of survey participants were in the 20-29 age range. Water intake and food consumption demonstrated considerable overlap over a 24-hour period. There were distinctive dietary trends in the 20s age group that different food types were representing the highest consumption each meal: (1) at breakfast, participants only had pork and dairy products with 63.9 and 130.9 g on average, respectively; (2) at lunch, beef and chicken products were consumed the most by 185.7 and 241.7 g; (3) and fish was consumed the most at dinner by 193.3 g. Low levels of nine antibiotics were detected across the samples tested, while amoxicillin and trimethoprim were the most frequently detected antibiotics from all samples. 12 out of 34 products had exceeded the acceptable daily intake antibiotic concentration for amoxicillin, ampicillin, and enrofloxacin. The estimated daily intake formula was modified for our study to calculate antibiotic intake from each meal. High potential of developing antimicrobial resistance was expected because the calculated antibiotic concentration outcomes were found within the range of MICs of *E. coli* reported EUCAST MIC database. Hence, the consequence of chronic exposure of the trace levels of antibiotics on human gut bacteria using the Hollow Fibre Infection Model (HFIM) warrants further investigation.