

EU Harmonised Survey of Antimicrobial Resistance (AMR) on retail meats (Pork and Beef/Chicken)

Research programme [Foodborne diseases B14](#)

Study duration January 2015 to December 2020

Project code FS102109

Conducted by Sampling: Hall Mark Meat Hygiene Ltd, Testing: Animal and Plant Health Agency (APHA)

Background

In accordance with Directive 2003/99/EC on monitoring of Zoonoses and Zoonotic agents, Member States must ensure that monitoring provides comparable data on the occurrence of antimicrobial resistance (AMR) in zoonotic agents. Also foreseen is the possibility of broadening the scope of the AMR monitoring to other zoonotic agents in so far as they present a threat to public health. The commission implementing decision 2013/652/EC lays down specific technical requirements for AMR testing and reporting in representative isolates deriving from randomised sampling of broilers, laying hens, fattening turkeys, fattening pigs and calves, performed at farm and/or slaughter, and of meat from broilers, pork and beef at retail. This survey concerns the mandatory sampling and testing of raw meat at retail within the UK. The Veterinary Medicines Directorate (VMD) is undertaking all slaughterhouse sampling.

Objective and approach

As the UK Competent Authority, the FSA is undertaking this survey on behalf of the EC and as such, must adhere to the Commission's Decision in relation to scope, sampling methodology, analytical methods, and reporting of data.

Whilst the survey actually runs from 2014 to 2020, there is no requirement to take retail samples for AMR in the first year. The sampling regimes are outlined below:

- 300 beef and 300 pork retail samples to be collected/tested in 2015, 2017 and 2019
- 300 poultry meat retail samples to be collected/tested in 2016, 2017 and 2020.

Sampling will represent 80% retail market share and 80% population coverage of the four countries of the UK; sampled proportionally throughout the full year. Analysis will require initial isolation and enrichment of *E. coli* from all meat samples, prior to testing for AMR *E. coli* (i.e. Extended Spectrum Beta Lactamases (ESBLs), AmpC and Carbapenemase-producing). Analysis will be performed in a step-wise process against a two-tier panel of antimicrobial agents depending on presence of positive isolates. Data collected by the testing facility will be submitted to the EC on an annual basis in May following each year of completion; aggregated to UK datasets with no identification of retail names or product brands.

Results

Year 3 Retail Beef & Pork Results (2017):

A total of 314 beef and 310 pork samples were tested between January and December 2017. Only 3 (0.48%) of the 624 samples tested yielded *E. coli* colonies on MacConkey agar + 1mg/L cefotaxime (MCA-CTX). These samples comprised 2 (0.64%) beef and 1 (0.32%) pork sample. None of the samples were positive on carbapenem agar.

Two of the isolates from MCA-CTX (1 beef (0.32%), 1 pork (0.32%)) had an AmpC phenotype, whilst the remaining isolate (1 beef (0.32%)) had an ESBL phenotype. The two beef samples that were positive on MCA-CTX were also positive on CHROMagar ESBL (CA-ESBL) and the resulting isolates tested were found to be positive for CTX-M1 type ESBL gene. One additional pork sample not positive on MCA-CTX was also positive on CA-ESBL and the resulting isolate tested was found to be positive for blaTEM gene.

None of the isolates were found to be resistant to the last resort carbapenem antibiotics imipenem, ertapenem and meropenem. A single beef sample was found to be contaminated with mcr-1 plasmid-mediated colistin resistant *E. coli*, but *E. coli* with this resistance was not detected in any of the pork samples. All isolates were resistant to the beta-lactam antibiotic ampicillin and the ESBL isolate was resistant to the cephalosporin antibiotics cefotaxime and ceftazidime, but was sensitive to ceftazidime. Conversely, the two AmpC isolates were resistant to ceftazidime.

Overall, results showed less than 1% of retail beef and pork samples in the UK that were tested were positive for AmpC or ESBL-producing *E. coli*, and these results are similar to the previous UK survey in 2015. None of the meat samples were positive for carbapenem resistant *E. coli* and only one beef sample was positive for mcr-1 plasmid-mediated colistin resistant *E. coli*. The EU Summary Report (EUSR) on Antimicrobial Resistance for 2015 presents the results for all European countries, and results for the UK compared favourably with results from other countries.

Research report

[View EU Harmonised Surveillance of Antimicrobial Resistance \(AMR\) in Bacteria from Retail Meats \(Year 3 - Beef and Pork, 2017\) as PDF \(1.67 MB\)](#)
[View Annex 1 - Interim report as PDF \(244.88 KB\)](#)

Team contacts

SERD

Team contact

England
SERD@food.gov.uk