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Campylobacter contamination of raw poultry meat at the retail level in Switzerland - a cross-sectional study

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Key words
Zoonoses, Campylobacter, quantitative, qualitative, occurrence, characteristics

Aim of the study
The objectives of the study were to collect data on the quantitative and qualitative Campylobacter contamination of poultry meat at retail level and to further characterise a selection of isolates based on whole genome sequencing (population structure, resistance genes, comparison with isolates from studies already conducted in Switzerland).

Material and methods
Between 14 May and 5 August 2024, 300 samples of raw poultry meat products (not marinated) were purchased at retail level. The samples came from 9 retailers (Coop, Migros, Alnatura, Spar, Lidl, Aldi, Volg, Denner, Top CC). There were 132 samples with skin, 168 samples without skin, 237 fresh meat products and 63 frozen products. The origin of the meat in 222 products was Switzerland, the origin of the meat in 78 products was imported (e.g. Germany, Slovenia…). 107 products were labelled as BTS, 50 as organic and 22 as free-range. The additional 121 products came from conventional farming (without additional labelling). Moreover, 50 marinated meat products were collected in August 2024 and were analysed.
Camplyobacter was detected quantitatively and qualitatively (ISO 10272-1:2017 and ISO 10272-2:2017). Selected isolates were further typed using a whole genome sequencing (WGS) approach (Illumina sequencing).

Results and significance
Campylobacter were quantitatively (> 100 CFU/g) detected in 13 (4.3 %) of 300 samples (bacterial count range: 100 CFU/g - 700 CFU/g). These were 10 products with skin and 3 products without skin. Isolates were all identified as *Campylobacter jejuni*; the products came from 5 different retailers. With a qualitative approach (after enrichment) Campylobacter were detected in 153 samples (51.0%) (148 *Campylobacter jejuni*; 5 *C. coli*). There were statistically significant differences between frozen products and fresh products ($p<0.001$) and between BTS farming and organic or free-range farming ($p<0.05$). There was also a statistically significant difference in the prevalence of Campylobacter between non-marinated and marinated products ($p<0.05$). Based on whole genome sequencing, the 66 characterised isolates showed a high diversity, with some clustering. There was no "dominant" MLST sequence type (ST). The further comparison with isolates from other Swiss studies (human strains (Ghielmetti et al. 2023); neck skin isolates (Stevens et al. 2024)) shows some of the same ST types (ST19, ST21, ST50, ST257). More than 50% of the isolates showed a *gyrA* mutation encoding for fluoroquinolone resistance. These current quantitative and qualitative data on the

Campylobacter contamination of poultry meat at retail level provide the basis for a further risk assessment and the definition of possible intervention measures.

Planned publications, posters and presentations

Stephan et al. (2024). Präsentation anlässlich des Meetings der «wissenschaftlichen Begleitgruppe Campylobacter» vom 22. Oktober 2024 am BLV.

Stephan et al. Campylobacter contamination of raw poultry meat at the retail level in Switzerland - a cross-sectional study (paper to be submitted to a peer reviewed journal).

Barmetter et al. Campylobacterbelastung von rohem Geflügelfleisch auf Stufe Einzelhandel in der Schweiz – eine Querschnittsstudie. Rundschau für Fleischhygiene und Lebesmittelüberwachung (RFL), in Vorbereitung.

Kelbert et al. (2025). Campylobacterbelastung von rohem Geflügelfleisch auf Stufe Einzelhandel in der Schweiz – eine Querschnittsstudie. Vortrag. 25. Fachtagung für Fleisch und Geflügelfleischhygiene Berlin, März 2025 (will be submitted)

Barmettler et al. (2025). Campylobacter contamination of raw poultry meat at the retail level in Switzerland - a cross-sectional study. Poster, 35. Arbeitstagung des Arbeitsgebietes Lebensmittelsicherheit und Verbraucherschutz, September 2025, Garmisch-Partenkirchen (will be submitted).

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