

**INTRODUCTION**

- Unreasonable use of antibiotics increases the selection of resistant bacteria
- The spread of bacteria carrying antimicrobial resistance (AMR) genes in wildlife and environment could turn the environment into an AMR hotspot
- Campylobacteriosis = principal bacterial gastroenteritis in industrialised countries<sup>1</sup>

**METHODOLOGY**

- Wild bird faeces samples
- Surface water samples
- Campylobacter* spp. isolation (passive filtration)
- NGS Illumina
- AMRFinderPlus<sup>2</sup>

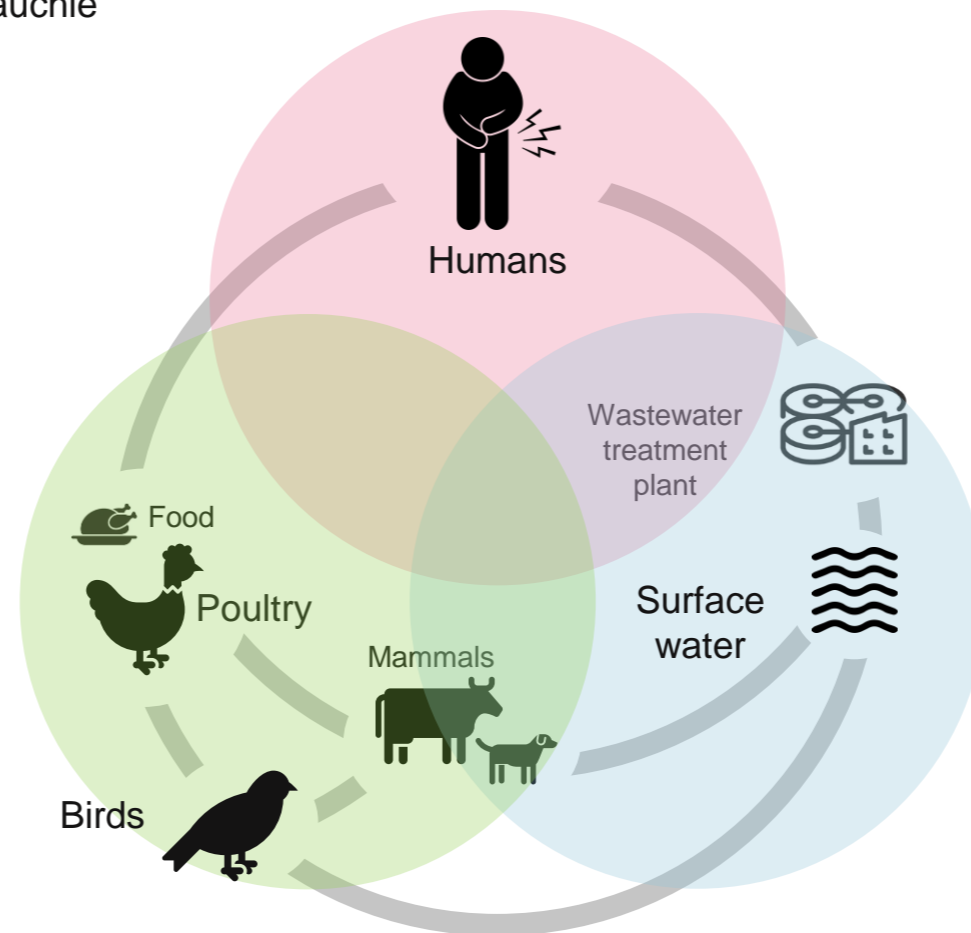
# ANTIBIOTIC RESISTANCE GENES CARRIAGE IN THE ENVIRONMENT: The case of *Campylobacter* in surface water and wild birds in Luxembourg

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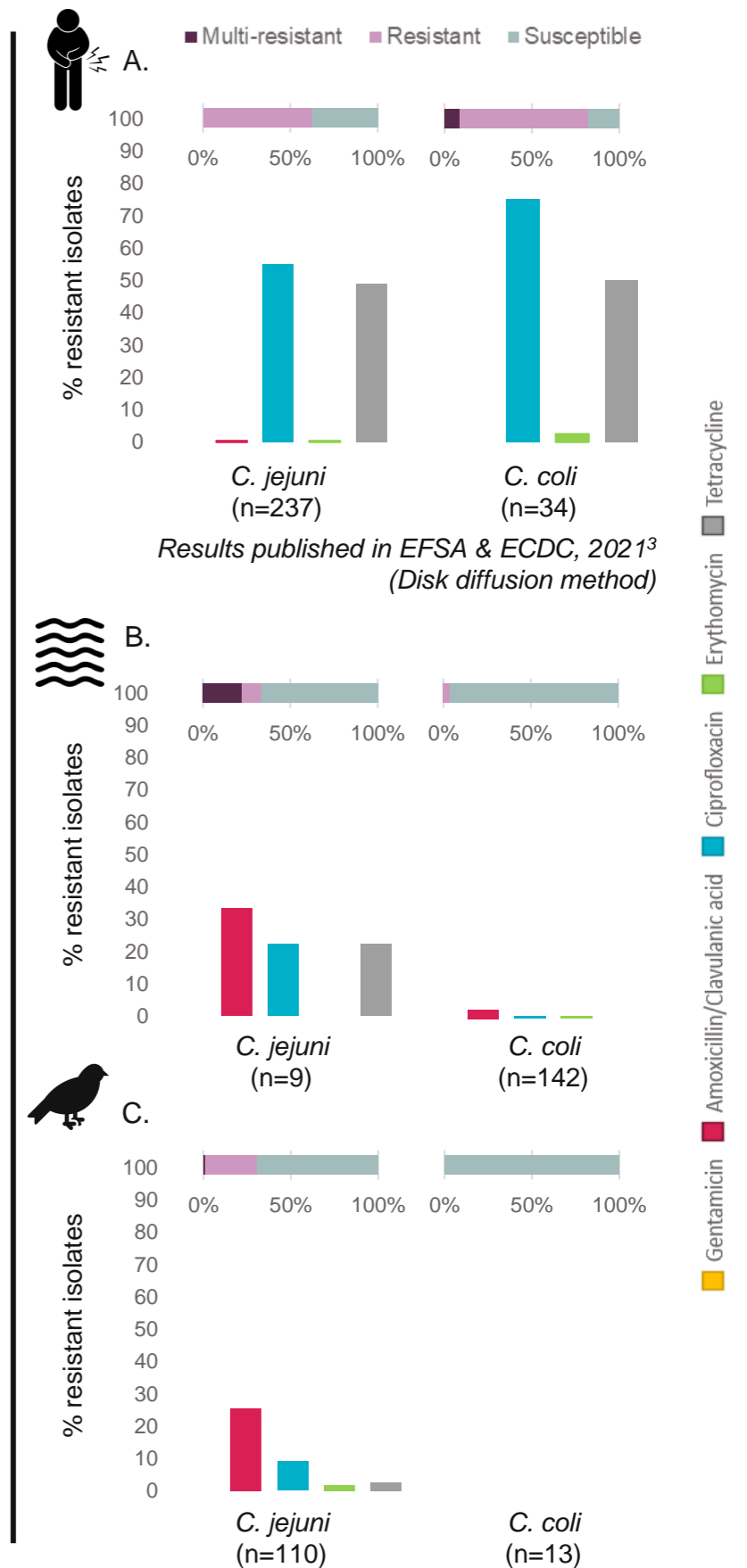


**TAKE-HOME MESSAGES**

- In Luxembourg, 62 and 82% of human *C. jejuni* and *C. coli* are resistant to at least one antibiotic<sup>3</sup>.
- Following human contamination, a lower proportion of resistant *Campylobacter* could reach environment via wastewater and the survival of *C. jejuni* is low.
- Wild birds are mainly contaminated by *C. jejuni* and display a different antibiotic resistance profile than human isolates.
- Beta-lactam resistance genes are the most prevalent in environmental *Campylobacter*.
- A surveillance of resistant bacteria in wild animals and environment is necessary to guide public health policies in the control of foodborne illness in humans.



**RESULTS**



% of resistant isolates and relative proportion of resistant isolates from humans (A), surface water (B) and birds (C) to gentamycin, amoxicillin/clavulanic acid, erythromycin and tetracycline.

1. EFSA (European Food Safety Authority) and ECDC (European Centre for Disease Prevention and Control), 2021. The European Union One Health 2019 Zoonoses Report. EFSA Journal 2021;19(2):6406, 286 pp.  
 2. Feldgarden M, Brover V, Gonzalez-Escalona N, Frye JG, Haendiges J, Haft DH, Hoffmann M, Pettengill JB, Prasad AB, Tillman GE, Tyson GH, Klimke W. AMRFinderPlus and the Reference Gene Catalog facilitate examination of the genomic links among antimicrobial resistance, stress response, and virulence. Sci Rep. 2021 Jun 16;11(1):12728.  
 3. EFSA (European Food Safety Authority) and ECDC (European Centre for Disease Prevention and Control), 2021. The European Union Summary Report on Antimicrobial Resistance in zoonotic and indicator bacteria from humans, animals and food in 2018/2019. EFSA Journal 2021;19(4):6490.