



POSTER

ASSESSING ANTIMICROBIAL RESIDUES IN EGGS FROM BACKYARD POULTRY PRODUCTION SYSTEMS IN ALBANIA

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Antibiotic residues in eggs are a public health concern, both for their direct toxicological effects and, even more, for their possible contribution to antimicrobial resistance (AMR). While the commercial egg supply in Europe is closely monitored, backyard poultry systems (BPS), widespread in the Western Balkans and especially in Albania, operate largely outside veterinary supervision and official inspection, yet supply a substantial share of the eggs sold in open-air markets. Their residue status has never been documented. This study aimed to provide the first estimate of antibiotic residue occurrence in eggs from BPS sold in the metropolitan area of Tirana (Albania) and to characterise their multi-class residue profiles.

In a cross-sectional survey (March-September 2023), 270 fresh eggs were collected by convenience sampling from vendors of non-commercial backyard flocks across the eleven municipal units of Tirana. Eggs from the same vendor were combined into pools of six, yielding 45 pooled samples, which constituted the analytical unit. Each pool was prepared by removing the shells and homogenising the whole egg content (yolk plus albumen); the homogenate was applied directly onto sterile paper discs, without prior extraction or clean-up, in line with the standardised European four-plate test (FPT) screening protocol. Pools were screened for antimicrobial activity by an agar-diffusion microbial inhibition assay based on the growth inhibition of susceptible indicator strains (*Kocuria rhizophila*, *Bacillus cereus*, *Bacillus subtilis*) on class-selective media at defined pH.

Four antimicrobial classes were targeted, with each plate including a class-representative reference standard as positive control: beta-lactams (ampicillin), tetracyclines (oxytetracycline), macrolides (erythromycin) and aminoglycosides (amikacin). An inhibition zone exceeding 10 mm was recorded as presumptive-positive (suspect). For each class, the prevalence of suspect pools was calculated with its 95% confidence interval (CI), and the co-occurrence of classes within pools was examined.

Suspected residues were frequently detected: at least one class was found in the majority of pools, and multiple classes were often present simultaneously. Class-specific prevalence was as follows: beta-lactams 42.2% (95% CI 29.0-56.7), macrolides 40.0% (26.3-55.4), aminoglycosides 28.9% (17.7-43.4) and tetracyclines 24.4% (14.2-38.7). Beta-lactams were most commonly involved in multi-class profiles, while tetracyclines and aminoglycosides showed a marked tendency to co-occur within the same pool.

Overall, backyard eggs marketed in Tirana frequently carried suspected antimicrobial residues, most often beta-lactams and macrolides. These findings identify the informal backyard supply as a relevant and previously overlooked route of residue exposure in Albania and highlight a potential risk for the co-selection of multidrug-resistant bacteria within a One Health framework. As the FPT is a qualitative screening tool, the results are presumptive and require confirmation and quantification by liquid chromatography-tandem mass spectrometry (LC-MS/MS) against established maximum residue limits (MRLs). They support extending official residue monitoring to this sector and promoting prudent antimicrobial use and adequate withdrawal periods among smallholder producers, measures that are particularly timely as Albania advances toward alignment with European Union food safety standards.