

Poster 9

Exploring antimicrobial resistance in autochthonous Portuguese hens: a study of *Escherichia coli* on eggshells

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Abstract

Background: The widespread use of antibiotics in intensive animal farming significantly contributes to antimicrobial resistance (AMR), posing a serious global public health threat [1]. Despite this, little is known about the role of autochthonous Portuguese laying hens as reservoirs of antibiotic-resistant *Escherichia coli*. Raised in extensive farming systems with reduced antibiotic exposure, these indigenous breeds offer a unique opportunity to study AMR dynamics under absent selective pressure. Investigating their role could yield valuable insights into the natural ecology of resistance and inform strategies for more sustainable livestock management [2]. **Objective:** To investigate the presence of antibiotic-resistant *E. coli* and antibiotic resistance genes on the 124 eggshells of autochthonous Portuguese laying hens. **Methods:** A total of 46 *E. coli* isolates previously obtained from *Preta Lusitânica* ($n=15$), *Amarela* ($n=9$), *Branca* ($n=12$), and *Pedrês Portuguesa* ($n=10$) eggshell swabs were confirmed by PCR. Antimicrobial susceptibility testing for 10 antibiotics was assessed following EUCAST/CLSI guidelines [3]. ESBL phenotype was searched using the Double-Disk Synergy Test. Antibiotic resistance genes (*bla*_{TEM}, *bla*_{CTX}, *bla*_{OXA-1}, *bla*_{SHV}) were searched by PCR in 44 of the 46 *E. coli* isolates. **Results:** *Escherichia coli* eggshell isolates exhibited resistance to gentamicin (96%), tetracycline (41%), ampicillin (24%), amoxicillin/clavulanic acid (4%), amikacin (4%), and trimethoprim/sulfamethoxazole (2%). Resistance to at least one antibiotic was found in 98% of the eggshell isolates, and a multidrug-resistant phenotype was identified in 17% of the isolates (*Preta Lusitânica*, *Branca*, *Pedrês Portuguesa*). Only 2% of the *E. coli* isolates showed pan-susceptibility (*Amarela*). ESBL phenotype was not detected. The *bla*_{TEM} and *bla*_{CTX} genes were detected in 36% and 11%, respectively, of the 44 *E. coli* isolates tested, while the *bla*_{OXA-1} and the *bla*_{SHV} genes were not detected. **Conclusion:** This study provides insights into AMR in autochthonous hens, highlighting the potential role of environmental factors, such as soil, water, feed, and even human contamination, in AMR transmission to the eggshells. The findings contribute to the understanding of AMR in extensive farming systems and underscore the importance of considering environmental sources in efforts to mitigate AMR, increase consumer confidence, and support the development of sustainable poultry practices.

Keywords: One Health; antimicrobial resistance; native breeds; laying hens; *Escherichia coli*

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