



International 58th Meat Industry Conference “Meat Safety and Quality: Where it goes?”

The change in antimicrobial resistance profile of meat chain-associated *Salmonella* in Serbia

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Abstract

This study aimed to monitor antimicrobial resistance trends of *Salmonella* isolated from meat production chains. A total of 5759 samples were examined for *Salmonella* presence and antimicrobial resistance. *Salmonella* species were isolated from 86 samples: (1.49%), 41 of these serotypes were *S. Enteritidis* (47.67%), 24 were *S. Infantis* (27.91%). In 2007, resistance in *Salmonella* was most frequently to amoxicillin and sulfamethoxazol. In 2013-2014 we detected significant resistance of *S. Infantis* to nalidixic acid and tetracycline. The results detected a national trend in *S. Infantis* resistance – the change of antimicrobial resistance profile.

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1. Introduction

The usage of antimicrobial drugs in food producing animals could result in antimicrobial resistance among pathogenic and commensal bacteria in these animals, and which may be transmitted to humans through the food chain and increase risk of treatment failures¹. Antimicrobial resistance in *Salmonella* is an increasing public health problem². The EU has a monitoring program that includes monitoring of resistance of food borne pathogens. There

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is no monitoring program for resistance of food borne pathogens in Serbia, so it is mainly monitored through scientific research projects. The aim of this study was to monitor the trends of resistance of *Salmonella* isolated from meat production chain.

2. Materials and methods

Samples were conducted from different points in the production chain: pig and bovine carcass swab samples from abattoirs, neck skin samples from poultry abattoirs, meat samples from cutting plants and meat samples from retail. A total of 5759 samples were examined according to the standard ISO³ and CLSI⁴ protocol.

3. Results and discussion

During 2013-2014, *Salmonella* species were isolated from 86 samples (1.49%), 41 of these serotypes were *S. Enteritidis* (47.67%), while 24 were *Salmonella* *Infantis* (27.91%), 12 were *S. Typhimurium* (13.95%) and 9 were other serotypes. *S. Infantis* was isolated from the slaughterhouse, mostly from poultry (17 serotypes), while others were from pigs (6 isolates) and mechanically separated meat (1 isolate). The high prevalence of *S. Infantis* in the poultry is possibly due to the massive use of *S. Enteritidis* and *S. Typhimurium* vaccines as part of the *Salmonella* eradication programmes. This trend, associated with poor breeding conditions, may lead to an epidemic increase of *S. Infantis* in poultry meat. *S. Infantis* is the third most common serotype isolated from humans in Serbia, and infection is often associated with the consumption of poultry products⁵. The presence of *S. Infantis* in slaughterhouses is related to fecal contamination and presence of *Salmonella* in live animals.

Table 1. Prevalence (%) of resistant *Salmonella* strains isolated from poultry and pig abattoirs in 2007⁶.

Antimicrobial drug	Poultry	Pigs
Amoxicillin 25	23.19	25.00
Cefuroxime 30	0.00	0.00
Imipenem 10	0.00	0.00
Gentamicin 10	7.25	0.00
Doxycyline 30	4.35	0.00
Trimethoprim 5	0.00	0.00
Ciprofloxacin 5	0.00	0.00
Chloramphenicol 30	1.45	0.00
Streptomycin 10	5.80	0.00
Sulfamethoxazol 100	13.04	25.00

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