



# Evaluation of antimicrobial resistance profiles on *Salmonella* isolates of broiler chickens at slaughter in Alberta, Canada



Chunu.mainali@gov.ab.ca

Mainali, C<sup>1</sup>, McFall, M<sup>1</sup>, Irwin, R<sup>2</sup>

<sup>1</sup>Food Safety and Animal Health Division (FSAHD), Alberta Agriculture and Rural Development, Edmonton, AB, Canada;

<sup>2</sup>Laboratory for Foodborne Zoonoses, Public Health Agency of Canada (PHAC), Guelph, ON Canada

## Abstract

- ❖ Salmonellosis is one of the most common bacterial foodborne diseases posing a major public health threat in industrialized countries<sup>1</sup> and *Salmonella* spp. are emerging as antimicrobial resistant pathogens.
- ❖ *Salmonella* spp. were isolated from broiler chickens at a slaughter facility in Alberta, Canada.
- ❖ Serotyping and antimicrobial profiling for 18 antimicrobials were done on 272 *Salmonella* isolates.
- ❖ *S. Hadar* and *S. Heidelberg* were the two most commonly isolated serovars.
- ❖ Resistance to at least one antimicrobial was found in 64.0% of the isolates (95% CI: 57.9 - 69.7), to three or more in 10.0% (95% CI: 6.6 - 14.1) and to five or more antimicrobials in 1.0% of the isolates (95% CI: 0.23 - 3.2).
- ❖ The highest resistance (54.8%) was to tetracycline (95% CI: 48.6 - 60.8), followed by streptomycin (24.2%; 95% CI: 19.3 - 29.8).
- ❖ Isolated *Salmonella* spp. revealed limited or no resistance to antimicrobials of critical importance in human medicine.

## Introduction

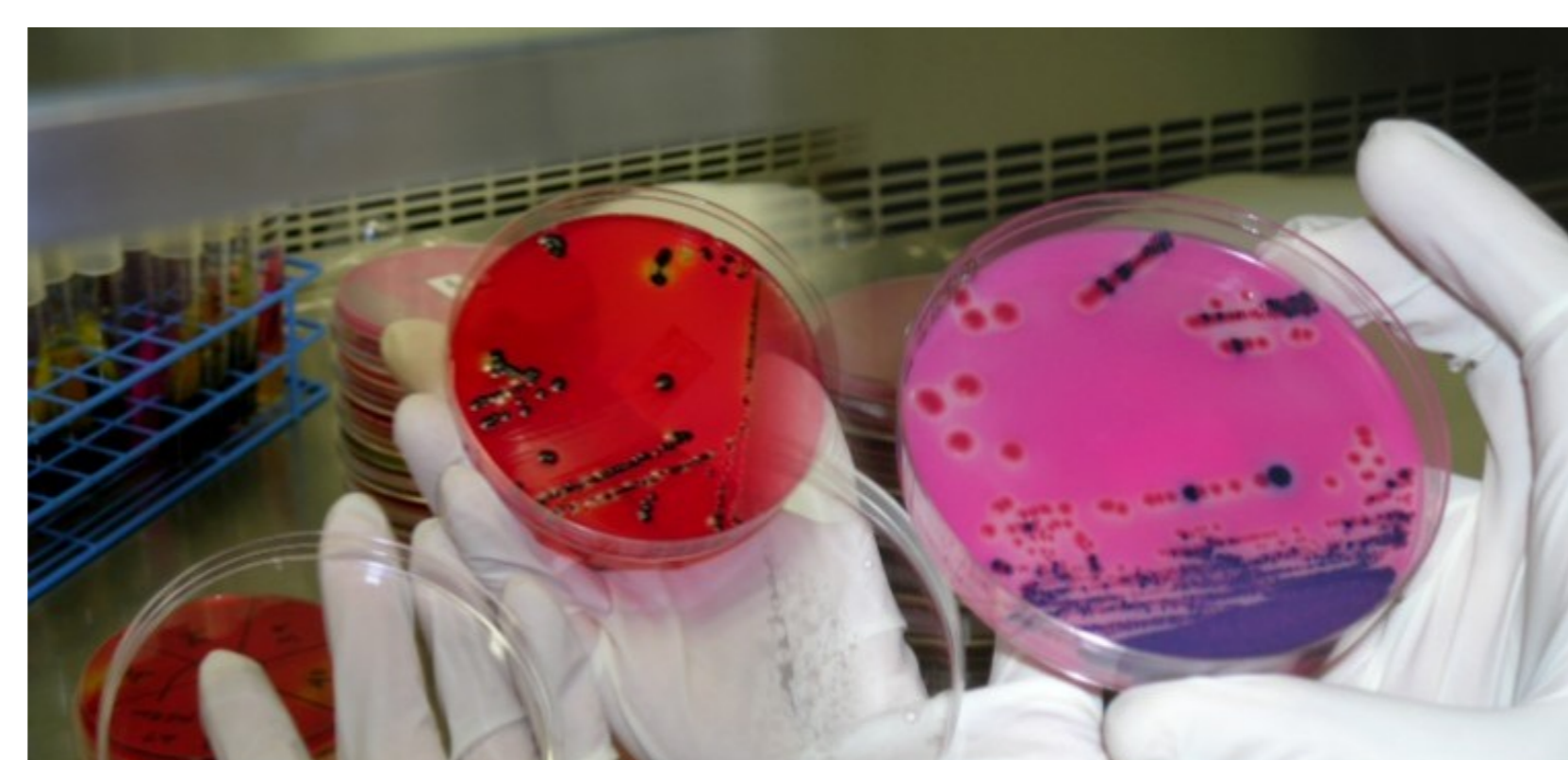
- ❖ Salmonellosis is one of the most common bacterial foodborne diseases in industrialized countries.
- ❖ Poultry and poultry products are important sources of *Salmonella* causing foodborne diseases in humans<sup>2</sup>.
- ❖ *Salmonella* spp. with antimicrobial resistance have emerged as food safety concern<sup>3</sup>.
- ❖ The emergence of multi-drug resistant *Salmonella* spp. is a serious public health problem, underlining the need for surveillance<sup>3</sup>.
- ❖ The objective of this study was to describe the antimicrobial resistance profiles of *Salmonella* isolates recovered from healthy broiler chickens at slaughter in Alberta, Canada.

## Materials and Methods

- ❖ Cecal, crop and neck skin samples were collected from broiler chickens at a slaughter facility from November 2004 to April 2005.
- ❖ *Salmonella* spp. were isolated following standard sample enrichment and real-time PCR screening followed by isolation procedures<sup>4</sup>.
- ❖ Serotyping and antimicrobial susceptibility testing was done on 272 *Salmonella* isolates recovered from 36 broiler flocks.
- ❖ Resistance to 15 antimicrobials was determined using broth microdilution.



Sample type	# of samples
Crop	24
Ceca	66
Neck skin	182



## Results

- ❖ All isolates were susceptible to amoxicillin-clavulanic acid, amikacin, ceftiofur, ceftioxin, ceftriaxone, and nalidixic acid.

Fig. 1. Resistance of *Salmonella* isolates according to antimicrobial (%)

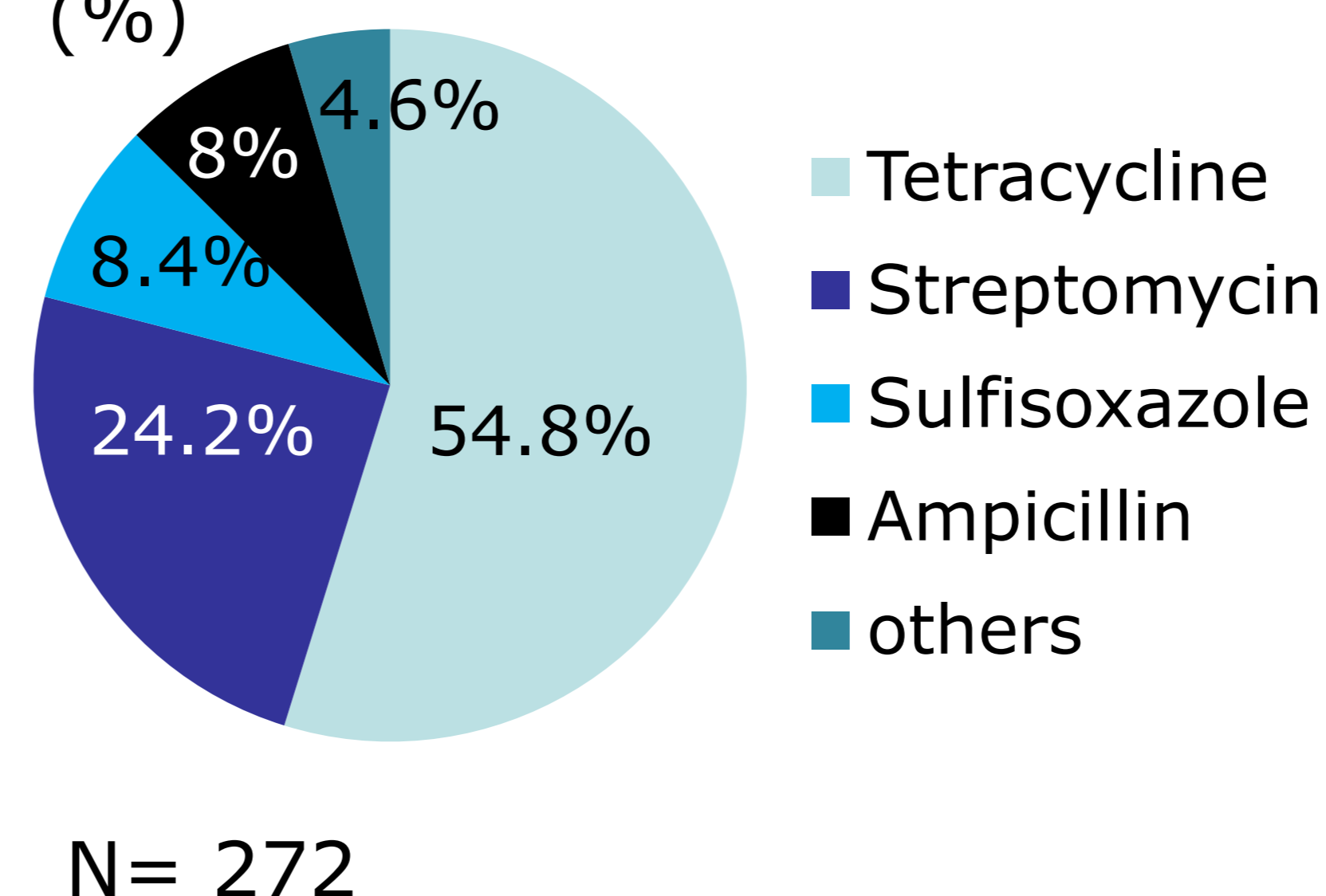


Fig. 2. Resistance of *Salmonella* isolates to one or more antimicrobials (%)

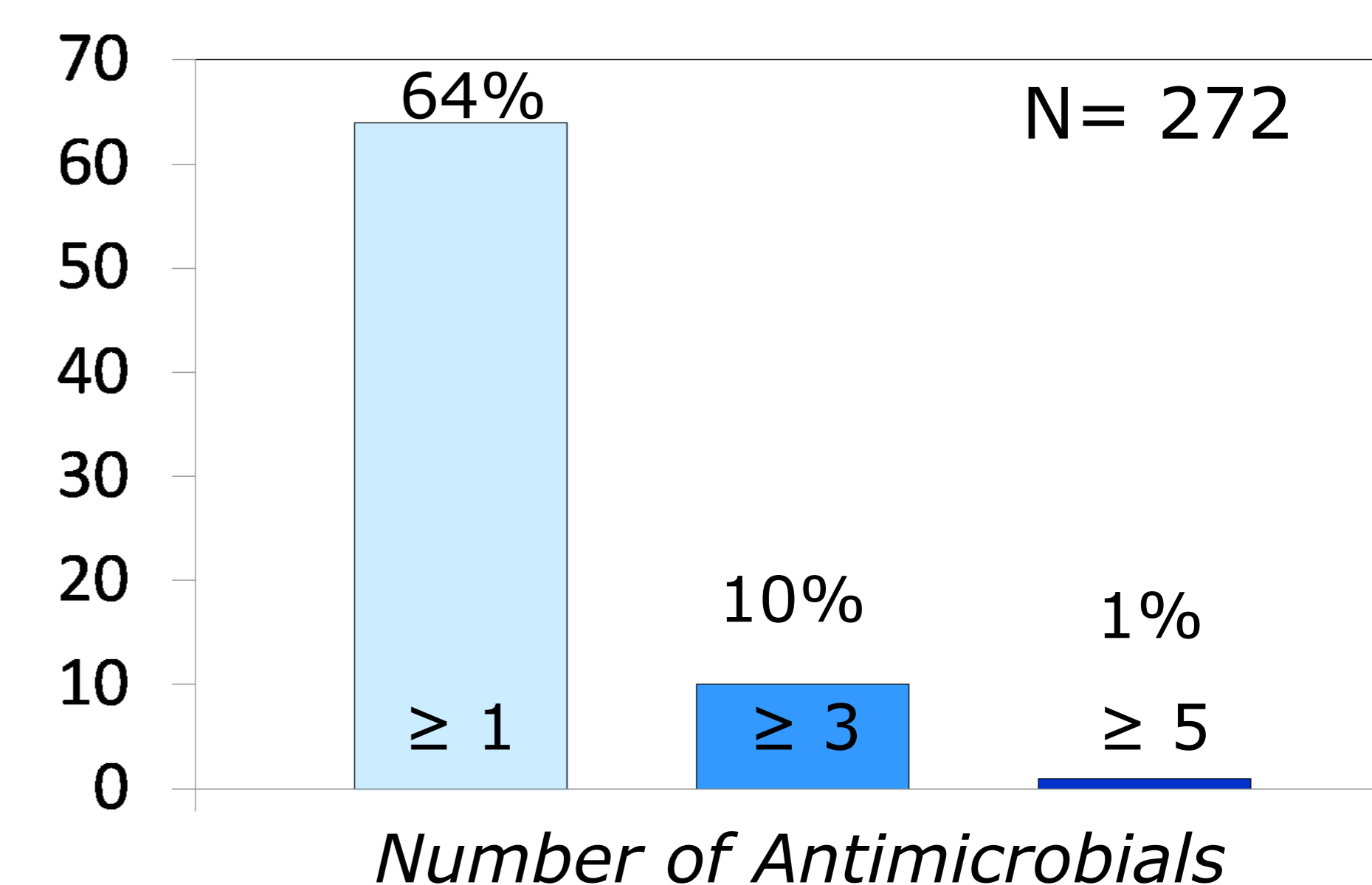
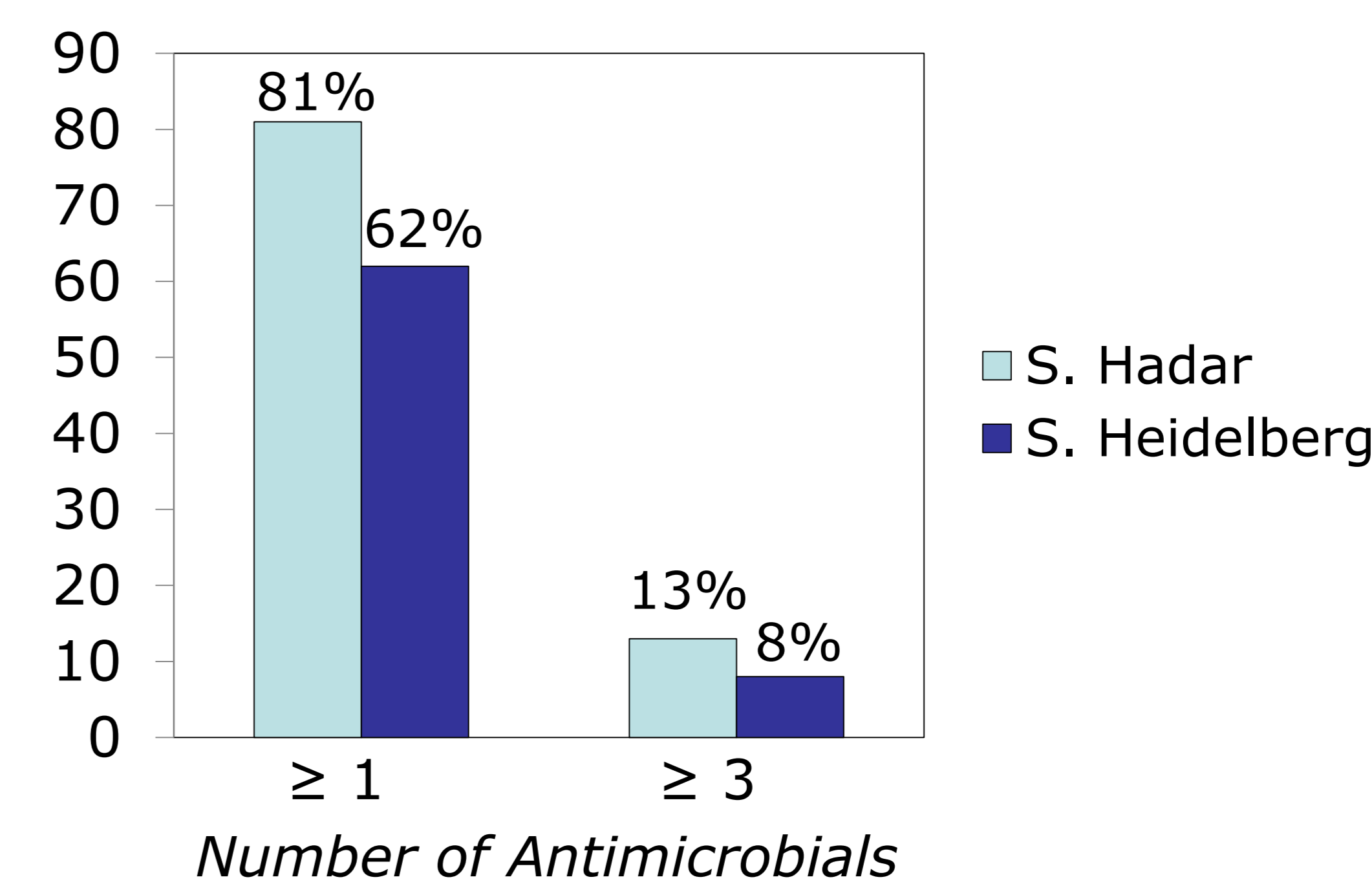


Table 1. Percentage distribution of antimicrobial resistant *Salmonella* isolates according to sample type

Sample type	% of Antimicrobial Resistant <i>Salmonella</i> isolates		
	One or more (95% CI)	Three or more (95% CI)	Five or more (95% CI)
Crop (n= 24)	70.8% (48.9 - 87.4)	8.3% (1.03 - 27)	0.0%
Ceca (n= 66)	56.0% (43.3 - 68.3)	18.0% (9.7 - 29.6)	0.0%
Neck skin (n=182)	65.9% (58.5 - 72.8)	7.1% (3.8 - 11.9)	1.6% (0.34 - 4.7)

- ❖ The most commonly isolated serovars were *S. Hadar* and *S. Heidelberg*.

Fig. 3. Resistance of *S. Hadar* & *S. Heidelberg* to one or more antimicrobials (%)



## Conclusions

- ❖ Sixty four percent of *Salmonella* spp. isolated from broiler chicken samples at a slaughter facility in Alberta, Canada, were resistant to at least one antimicrobial.
- ❖ The *Salmonella* spp. isolated in this study showed limited or no resistance to antimicrobials of critical importance in human medicine.

## References

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