PREVALENCE AND ANTIBIOTIC SENSITIVITY PATTERN OF EXTENDED-SPECTRUM BETA-LACTAMASE-PRODUCING *Salmonella spp.* IN POULTRY MEAT FROM SELECTED PROCESSING PLANTS IN IBADAN, NIGERIA

Peace O. Ojeade*[1], Victoria O. Adetunji[1], Adebayo Awoyele[1], Emmanuel A. Olayiwola[1], Precious Oladipo[1], Oluwatobi S. Fasiku[1] , Olayemi Okunlade[1]

Department of Veterinary Public Health and Preventive Medicine, Faculty of Veterinary Medicine, University of Ibadan, Ibadan, Oyo State, Nigeria[1]

correspondence: pojeade@gmail.com

University of Ibadan

INTRODUCTION

Poultry meat constitutes a global food supply. *Salmonella spp.*, a major foodborne disease, offers both economic and public health risks.

Salmonella is a genus of rod-shaped(bacillus), non-spore-forming, predominantly motile, gram-negative bacteria of the family Enterobacteriaceae (Popa *et al.,* 2021). Globally documented as a significant pathogen of zoonotic concern for both animals and humans in developed and developing countries. Above 2500 *Salmonella* serovars are globally distributed. Responsible for most foodborne gastrointestinal disease cases worldwide and cause salmonellosis (Igbinosa *et al.,* 2023).

The ever-increasing use of antibiotics has led to continuous propagation of antibiotic-resistant microbes, which has been identified as a threat to public and animal health globally with an estimated mortality of about 4.5 million as of 2019 (Van Boeckel *et al.* 2015; Murray *et al.* 2022). ESBL-producing Salmonella strains pose a significant public health threat due to their multidrug resistance and potential to cause infections in both animals and humans. (*Ibrahim, et al; 2020*).

OBJECTIVE

We investigated the prevalence and antibiogram of ESBL - producing *Salmonella spp* in poultry meat from selected processing plants in Ibadan Nigeria, and identified predisposing risk factors.

MATERIALS AND METHODS

|	PROCESSING PLANTS					Total
LGA	OLUYOLE		IBADAN SOUTH WEST		LAGELU	
Processing plant	Plant A	Plant B	Plant C	Plant D	Plant E	
No. of samples	32	30	31	31	30	153

Sample collection **Sampling frame**

A total of 153 Chicken swab samples were collected from processed birds at packaging points from five processing plants with high processing capacity (2000-6000) in Ibadan, Nigeria. Isolation of Salmonella spp. was done using standard procedures. Also, antibiotic sensitivity testing was done using the Kirby-Bauer disc diffusion method. The ESBL isolates were confirmed using the double disc diffusion test. Data were analysed using descriptive statistics.

Methods
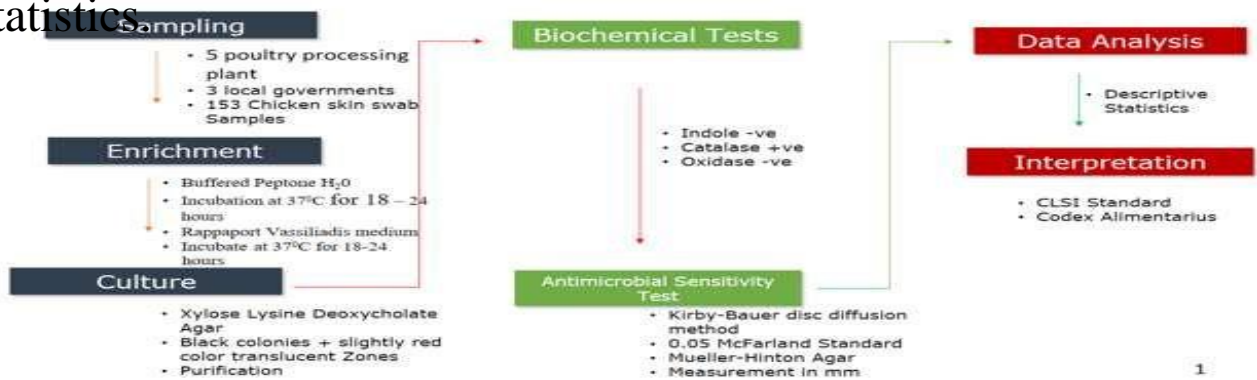
RESULTS

Overall, the prevalence of *Salmonella spp.* was 56 (36.6%). The antibiotic susceptibility profile revealed a high prevalence of Multi-drug Resistance, MDR (64.3%; 36/56) and Extensive drug Resistance, XDR (20/56; 35.7%) among all *Salmonella spp.* isolates. The prevalence of ESBL-*Salmonella spp.* and non-ESBL *Salmonella spp.* were 2.6% (4/153) and 34% (52/153) respectively. Also, 1.3% (2/153) of ESBL-*Salmonella* was recovered from processing plant A.

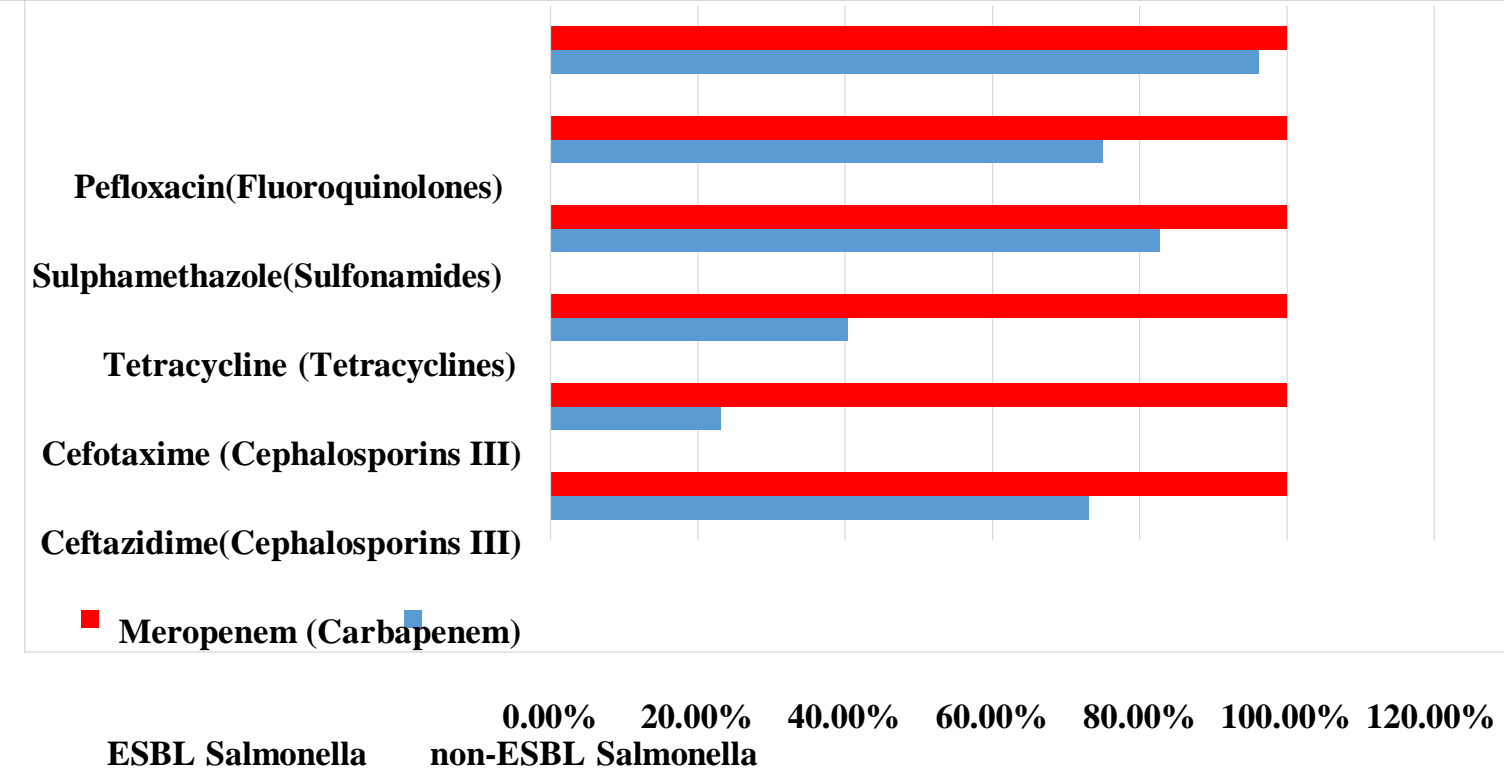A) **52** non-ESBL *Salmonella* Isolates (34.0%)   B) **4** ESBL-*Salmonella* Isolates (2.6%)
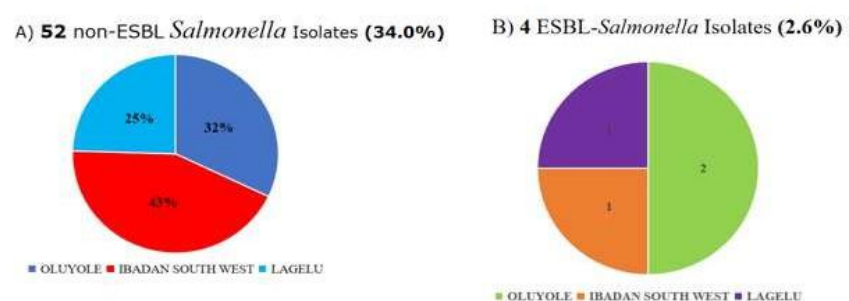
RESULTS

Furthermore, all ESBL- *Salmonella* (100.0% 4/4) were MDR and XDR while 57.7% (30/52) and 28.8% (15/52) of non-ESBL *Salmonella spp.* were MDR and XDR respectively. Five different antibiotypes of non-ESBL *Salmonella* were found with MEM-TE-SXT-PEF (54%; 28/52) being predominant. However, ESBL *Salmonella spp.* presented one antibiotype (MEM-CAZ-CTX-SXT-TE-PEF) (100%; 4/4) resistance to all antibiotics tested.
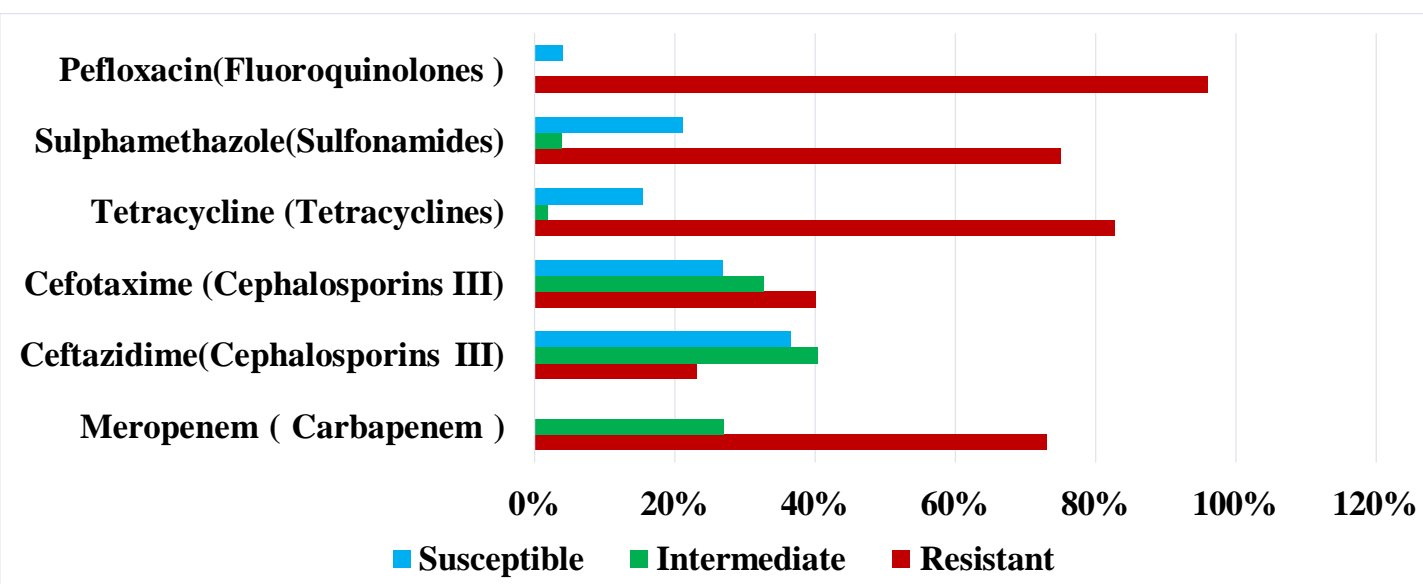
Antibiotic Resistance Profile of Salmonella spp. isolates from poultry meat in selected processing plants within Ibadan, Nigeria

Antibiotic Resistance Pattern of ESBL and non-ESBL Salmonella isolates

Antibiogram of ESBL and non-ESBL *Salmonella* isolates from samples

Antibiotype of non-ESBL *Salmonella* isolates		Antibiotype of ESBL *Salmonella* isolates	
Antibiotype	isolates (n=52) (%)	Antibiotype	isolates (n=4) (%)
MEM-CAZ-CTX	2 (3.8)	MEM-CAZ-CTX-TE-SXT-PEF	4 (100)
MEM-TE-SXT-PEF	28 (53.8)		
MEM-CAZ-TE-SXT-PEF	3 (5.8)		
MEM-CTX-TE-SXT-PEF	8 (15.4)		
MEM-CAZ-CTX-TE-SXT-PEF	1 (1.9)		

KEY: MEM = Meropenem(30µg); CAZ= Ceftazidime(30µg); CTX= Cefotaxime(30µg); TE= Tetracycline (30µg); STX= Sulfamethoxazole (25µg); PEF = Pefloxacin(5µg)

CONCLUSION

The high rate of multi-drug resistant (MDR) and Extensive-drug resistant (XDR) ESBL- *Salmonella* isolates in this study underscores the need to control access and indiscriminate use of antibiotics. The need to enforce rational antibiotic use and adherence to withdrawal period before slaughter, strict hygiene and well-integrated national surveillance systems to monitor Salmonella and antimicrobial resistance in poultry are critical to curtailing the spread of these drug-resistant pathogens of public health significance.