

INTRODUCTION & OBJECTIVES

- Retail meat may act as a reservoir for the transmission of β -lactam resistant bacteria (BLRB) or resistance genes to humans through the food chain.
- The aim of our study was to screen and characterize phenotypic and genotypic patterns of BLRB isolated from retail meat samples in Lebanon over a 2-year period.

METHODS

- A total of 130 meat samples were collected from 12 Lebanese districts (80 in 2015 and 50 in 2016: 54 beef; 18 lamb and 58 poultry).
- Antibiotic susceptibility was evaluated by disk diffusion test according to 2015/2016 EUCAST guidelines. Extended spectrum β -lactams (ESBL) production was confirmed by synergy test, plasmid acquired Class C cephalosporinases (AmpC) were identified by cloxacillin test and carbapenemases were detected by the Rapidec Carba-NP test (BioMérieux).
- Resistance genes were characterized by PCR sequencing for isolates with specific primers for ESBL (CTX-M-group 1, SHV and TEM), AmpC (ACC, FOX, MOX, DHA, CIT and EBC) and carbapenemases (KPC, NDM, OXA-48, IMP-1, IMP-2, VIM, GES).

RESULTS

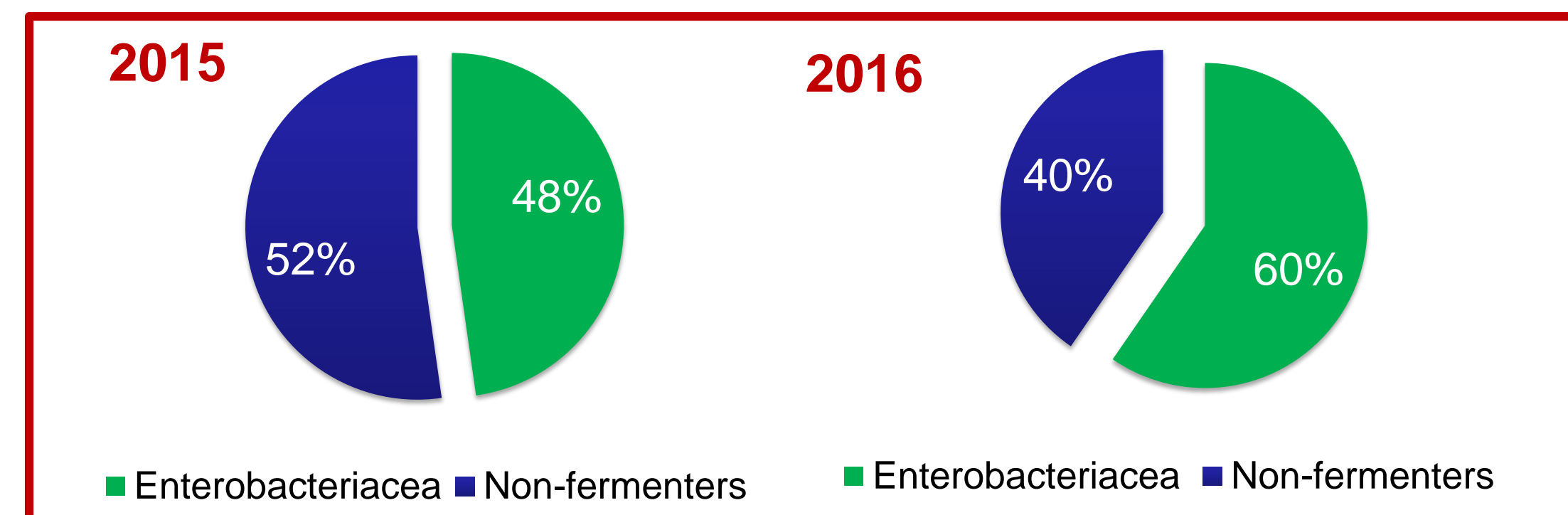


Fig.1. Percentage of isolates in 2015 and in 2016.

- In 2015, **98% of meat samples presented BLRB** with a total number of 90 isolates including 43 Enterobacteriaceae and 47 non-fermenters.
- In 2016, **94% of meat samples contained BLRB** with a total number of 52 isolates, counting 31 Enterobacteriaceae and 21 non-fermenters (including 12 *Pseudomonas spp*) (Fig.1).
- Seventy four isolates (n=74) producing broad-spectrum beta-lactamases were detected during the study. The distribution of the isolates was as follows:
 - 61 *Escherichia coli*
 - 4 *Klebsiella oxytoca*
 - 3 *Salmonella arizonae*
 - 2 *Escherichia fergusonii*
 - 2 *Citrobacter freundii*
 - 1 *Enterobacter aerogenes*
 - 1 *Serratia liquefaciens*
- The phenotypic study on Enterobacteriaceae identified three major groups of broad-spectrum beta-lactamases: **23% (n=17) of ESBLs, 60.8% (n=45) of AmpC, and 5.4% (n=4) of carbapenemases.** The details of the molecular characterization are shown in Table 1.

Table 1: Molecular characterization of beta-lactam resistance in meat.

Année		2015	2016
Nombre total d'isolats (n=74)		43	31
BLSE	CTX-M-group1	12(28%)	3(9.7%)
	SHV	3(7%)	0
	TEM	8(18.6%)	2(6.5%)
Classe C Céphalosporinases	CIT	16(37%)	18(58%)
	MOX	3(7%)	1(3.2%)
Carbapénèmases	NDM-1	1(2.3%)	1(3.2%)
	KPC	1(2.3%)	0

CONCLUSIONS

- This study illustrates the alarming rates of resistance in Lebanese retail meat with the diffusion of several classes of carbapenemases and plasmidic AmpC.
- It emphasizes the urgent need to develop antimicrobial stewardship initiatives to prevent the transmission of these resistance genes to humans through the food chain.

REFERENCES

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