



Antimicrobial resistance in *E. faecium* and *E. faecalis* isolated from poultry and bovines



CODA CERVA Veterinary and Agrochemical Research Center - Groeselenberg, 99 B-1180 BRUSSELS
BELGIUM phone : +32(0)2 379 04 00 www.coda-cerva.be

Peeters L.¹, Argudín M.A.¹, Butaye P.^{1,2}

1 Department of General Bacteriology, Veterinary and Agrochemical Research centre, Brussels, Belgium
 2 Department of Pathology, Bacteriology, and Avian Diseases, Ghent University, Ghent, Belgium

Introduction

Enterococci are regarded as general indicators for resistance among Gram positive bacteria. They are continuously present in nearly all animal species, being the most prevalent facultative aerobic Gram positive bacteria. Therefore, enterococci are the most suitable bacteria for antimicrobial resistance surveillance in Gram positive bacteria and to follow up the resistance evolution in time. Enterococci have been studied frequently in several countries, allowing the comparison of antimicrobial resistance frequencies from different geographical regions. Moreover, the genetic background of resistance in this species is quite well known, allowing a scientific interpretation of the resistance data.

Materials and methods

Samples from faecal material were taken from broiler chickens and bovines (for meat production) in 2011. Conventional isolation procedures and the tRNA intergenic spacer PCR as species identification method were used to identify *E. faecalis* (*Es*) and *E. faecium* (*Em*). A total of 167 enterococci isolates (poultry: 81 *Es*, 33 *Em*; bovines: 24 *Es*, 29 *Em*) were tested for susceptibility by a micro broth dilution method using Eucast breakpoints.

Results

Table 1. Antimicrobial resistance in *E. faecalis* and *E. faecium*

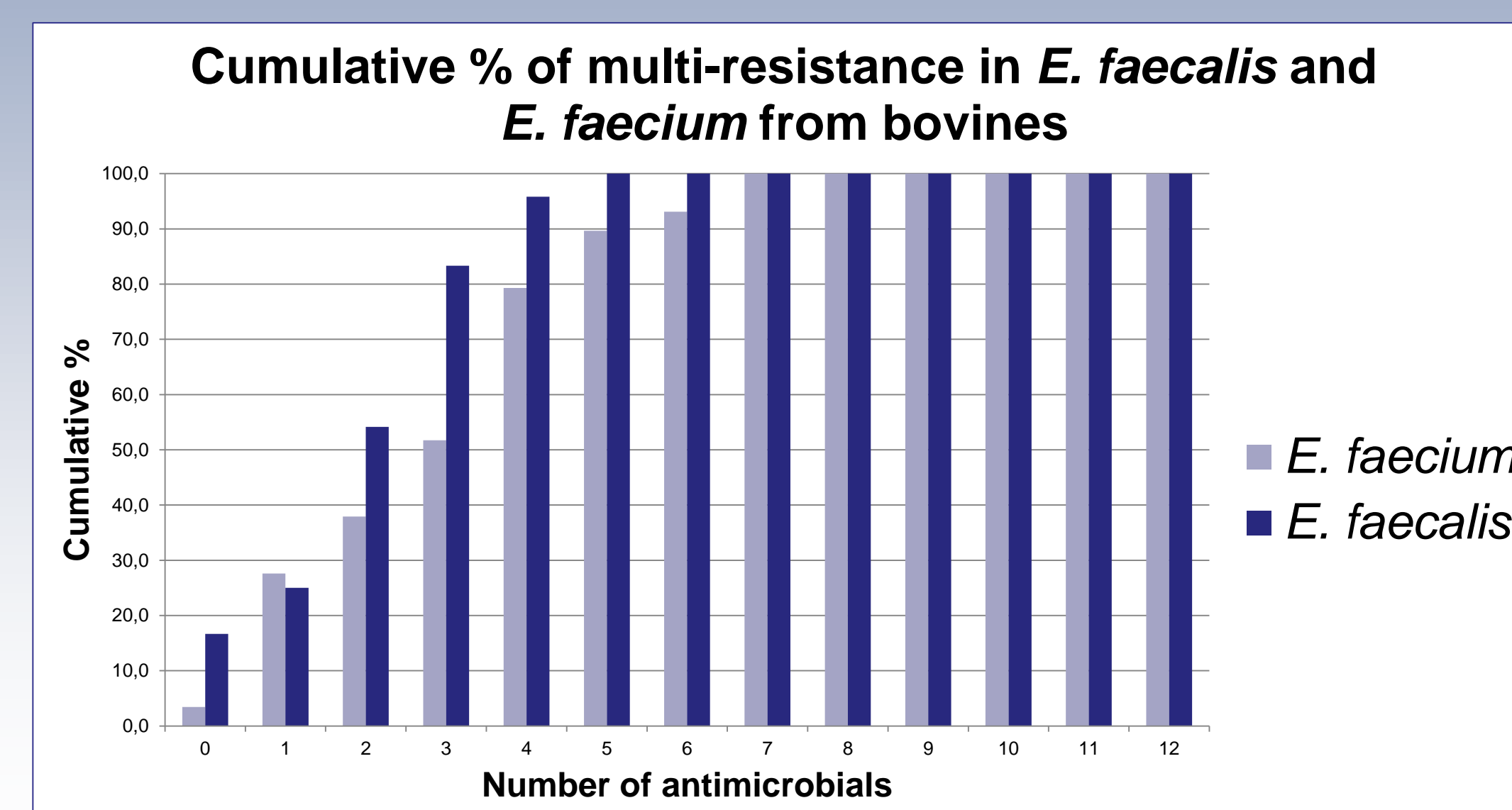
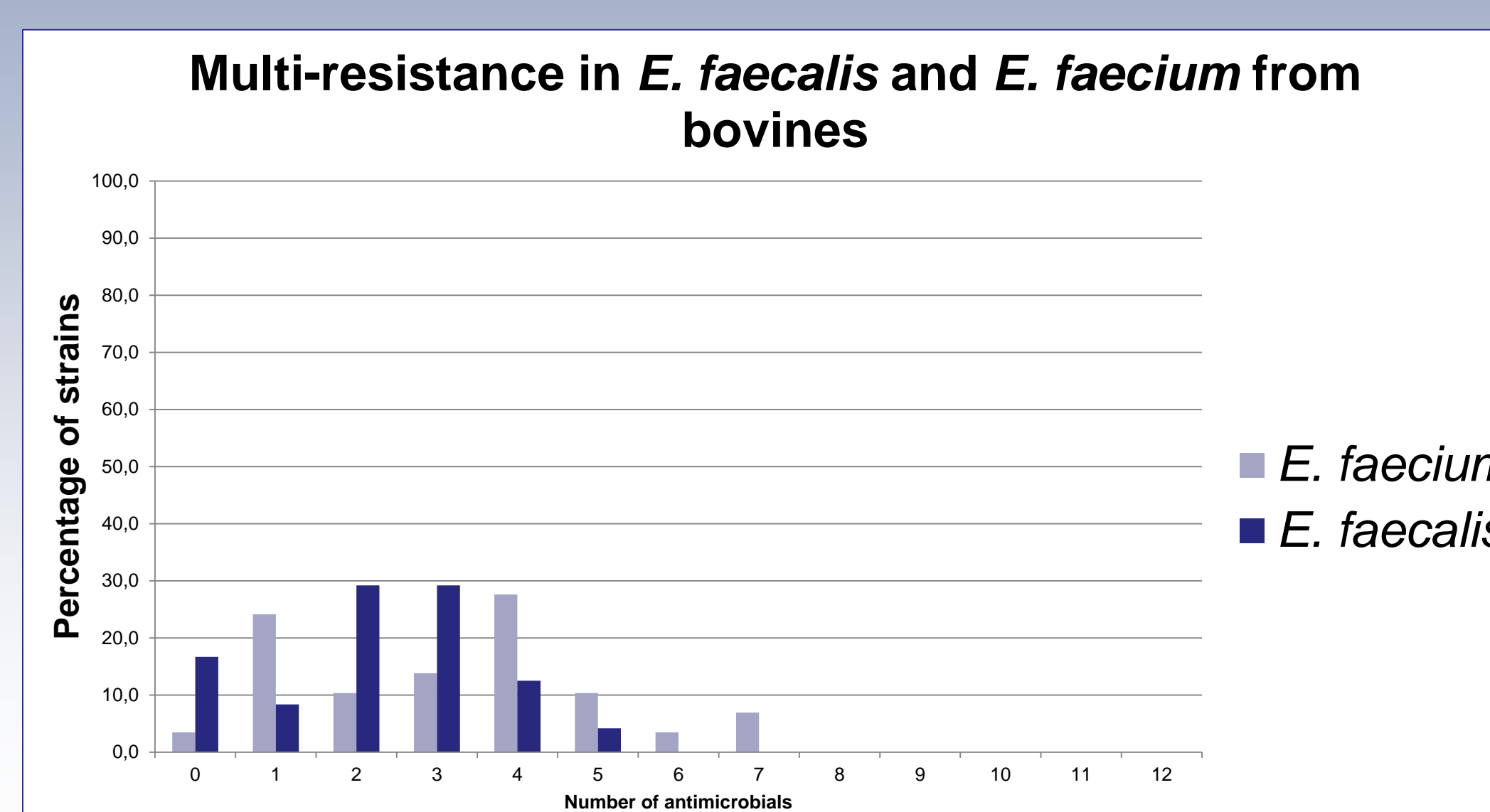
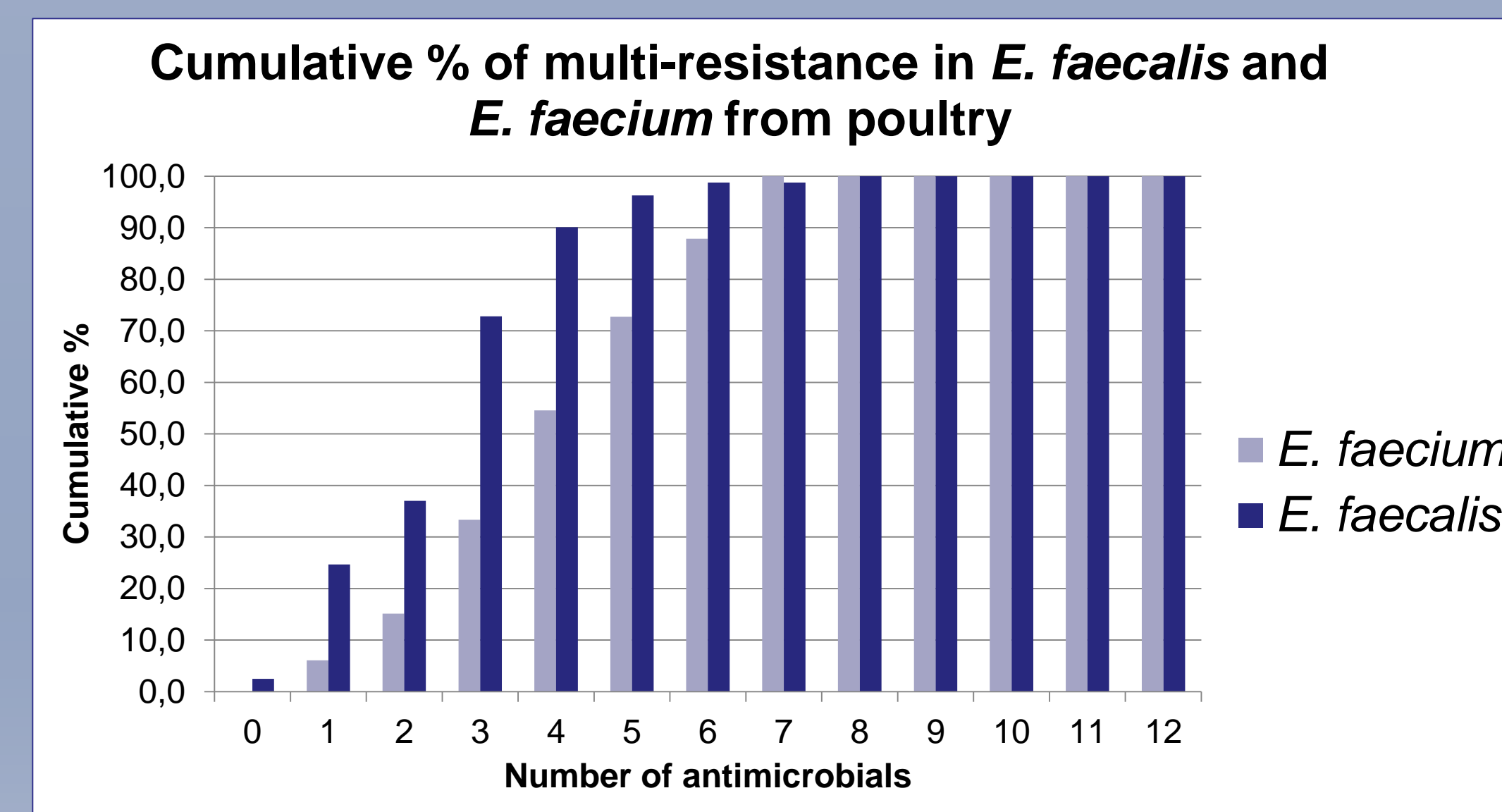
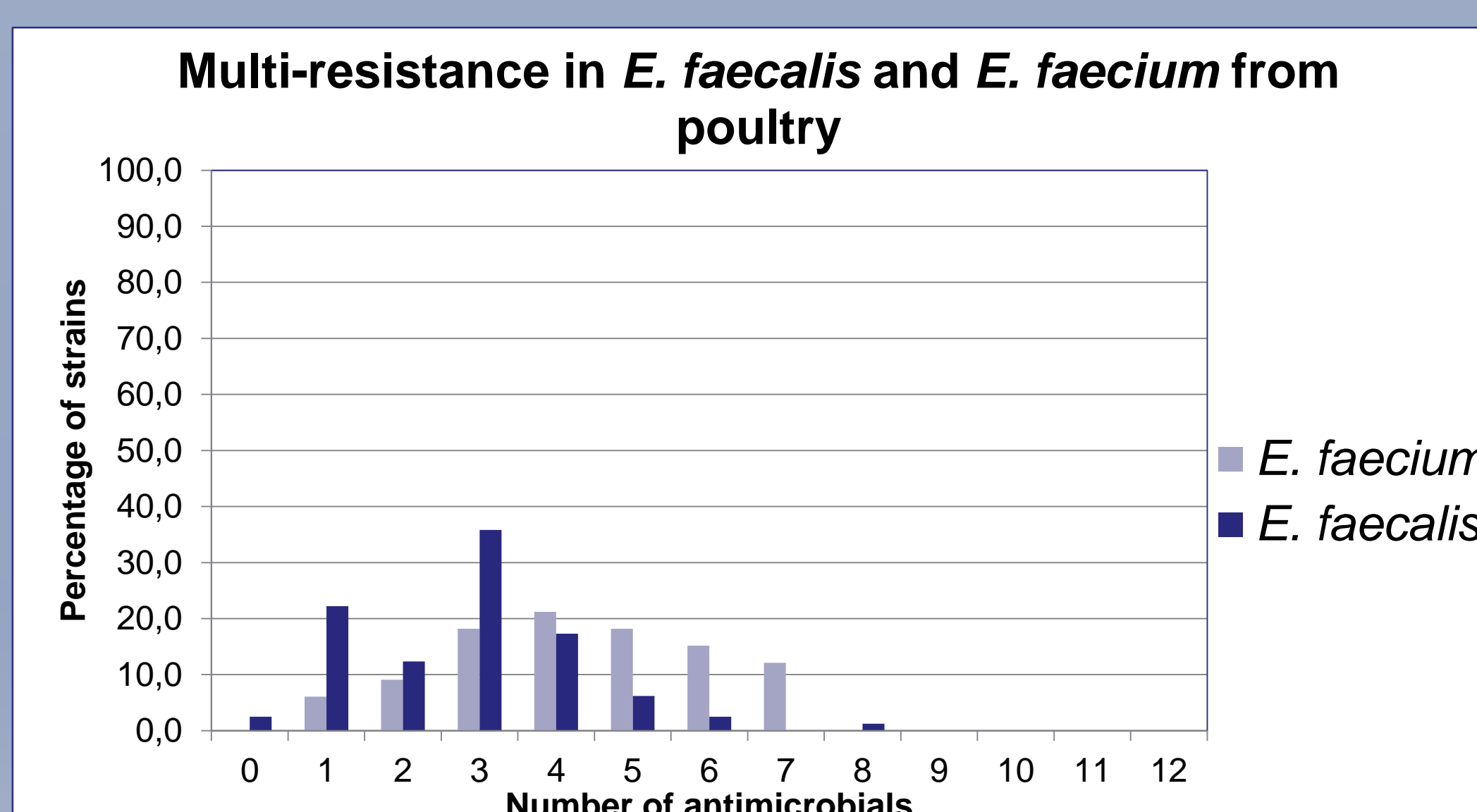
Antimicrobial	<i>E. faecalis</i>				<i>E. faecium</i>			
	Poultry		Bovines		Poultry		Bovines	
	%R	CI	%R	CI	%R	CI	%R	CI
AMP	11,1	5,2-20,0	8,3	1,0-27,0	24,2	11,1-42,0	13,8	3,9-32,0
CHL	9,9	4,4-19,0	8,3	1,0-27,0	9,1	1,9-24,0	17,2	5,8-36,0
CIP	3,7	0,8-10,0	0,0	0,0-14,0	18,2	7,0-35,0	13,8	3,9-32,0
ERY	76,5	65,8-85,0	62,5	40,6-81,0	72,7	54,5-87,0	58,6	38,9-76,0
FFN	0,0	0,0-4,0	0,0	0,0-14,0	0,0	0,0-11,0	0,0	0,0-12,0
GEN	3,7	0,8-10,0	4,2	0,1-21,0	0,0	0,0-11,0	0,0	0,0-12,0
LIN	6,2	2,0-14,0	0,0	0,0-14,0	6,1	0,7-20,0	0,0	0,0-12,0
SAL	13,6	7,0-23,0	4,2	0,1-21,0	51,5	33,5-69,0	20,7	8,0-40,0
STR	59,3	47,8-70,0	62,5	40,6-81,0	54,5	36,4-72,0	44,8	26,4-64,0
SYN	1,2	0,0-7,0	0,0	0,0-14,0	100,0	89,4-100,0	96,6	82,2-100,0
TET	90,1	81,5-96,0	75,0	53,3-90,0	84,8	68,1-95,0	65,5	45,7-82,0
VAN	3,7	0,8-10,0	0,0	0-14,0	9,1	1,9-24,0	0,0	0,0-12,0

Table 2. List of abbreviations

%R	Resistant isolates (%)
CI	Confidence interval
N	Number of strains
AMP	Ampicillin
CHL	Chloramphenicol
CIP	Ciprofloxacin
ERY	Erythromycin
FFN	Florphenicol
GEN	Gentamicin
LZD	Linezolid
SAL	Salinomycin
STR	Streptomycin
SYN	Synercid (quinupristin/dalfopristin)
TET	Tetracycline
VAN	Vancomycin

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Multi-resistance in *E. faecium* and *E. faecalis*



Conclusions

In general, poultry isolates showed higher levels of multi-resistance than bovine isolates. Moreover, some poultry isolates were resistant to vancomycin and linezolid, two important antimicrobial agents with activity against Gram-positive pathogens. The spread of these resistances through horizontal transmission may be a hazard for human health. The results of this study underline the role of enterococci as reservoir for antibiotic resistance.

