EBF 2015
European Buiatrics Forum

gtv03
GROUPEMENT TECHNIQUE VÉTÉRINAIRE DE L'ALLIER

MERIAL

EnvA
École nationale vétérinaire d'Alfort

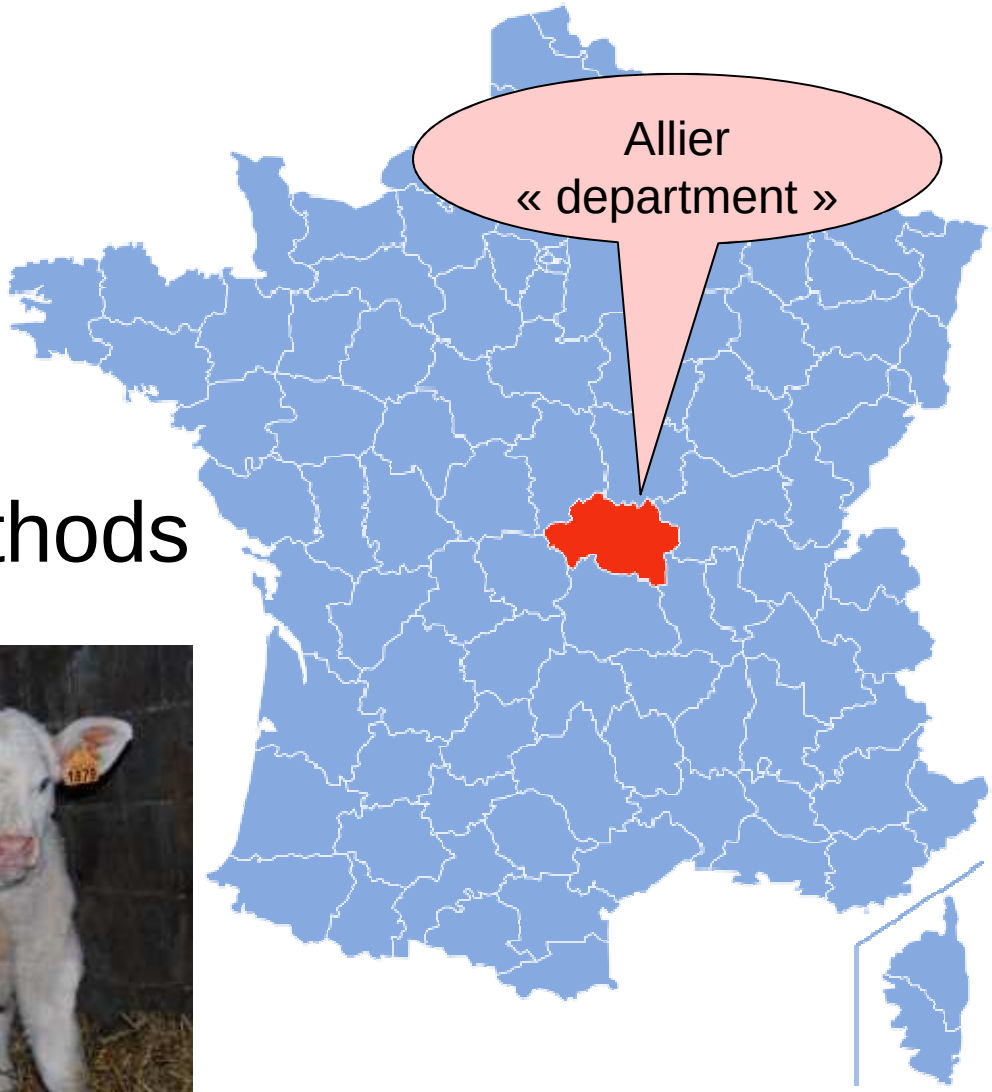
eurofins

Antimicrobial resistance in *Escherichia coli* implicated in calf scours: study in the Centre of France between 2011 and 2013

Lacroute H, Thiercy JY, Roumegous B, Chantreau J, Bolon A, Gisbert P, and **Millemann Y**

Outline

- Introduction
- Aims of the study
- Materials and methods
- Results
- Conclusion

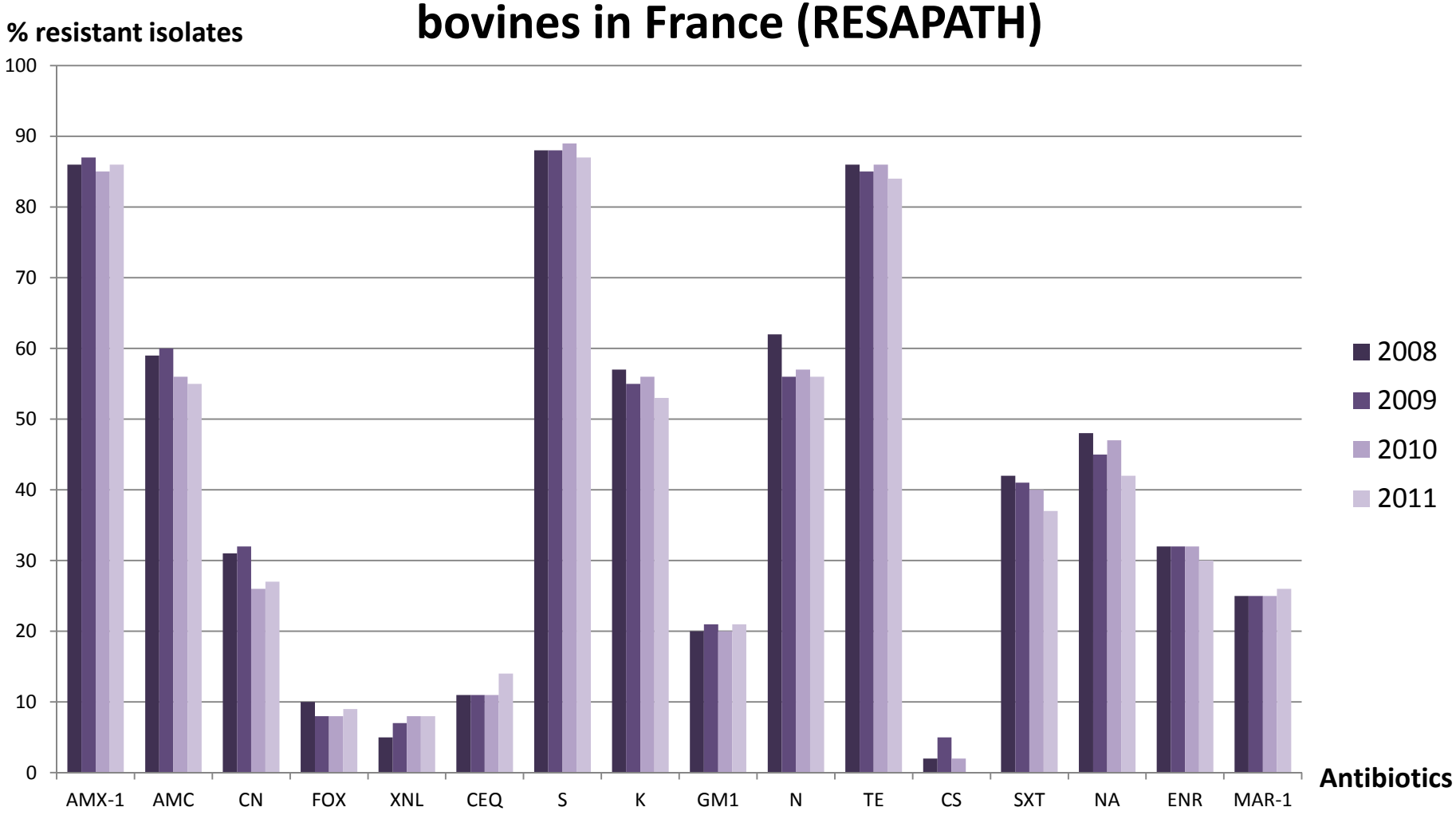


Introduction

- Calf scours = a major issue in bovine herds
  - Around 20-25% prevalence in 0-3months-old calves
  - A frequent use of antibiotics
    - Even if responsible use after a thorough clinical examination
- Antibiotic resistance = a major issue in public health
  - *E.coli* is concerned (exposed commensal flora + pathogenic isolates) = surveillance data
  - Increase of MDR isolates…

Antimicrobial resistance in *Escherichia coli* implicated in calf scours

Proportion of resistant *E.coli* isolated from young bovines in France (RESAPATH)



References: Chazel *et al*. (2009), Chazel *et al*. (2010), Chazel *et al*. (2011) and Jarrige *et al*. (2012)

Aims of the study

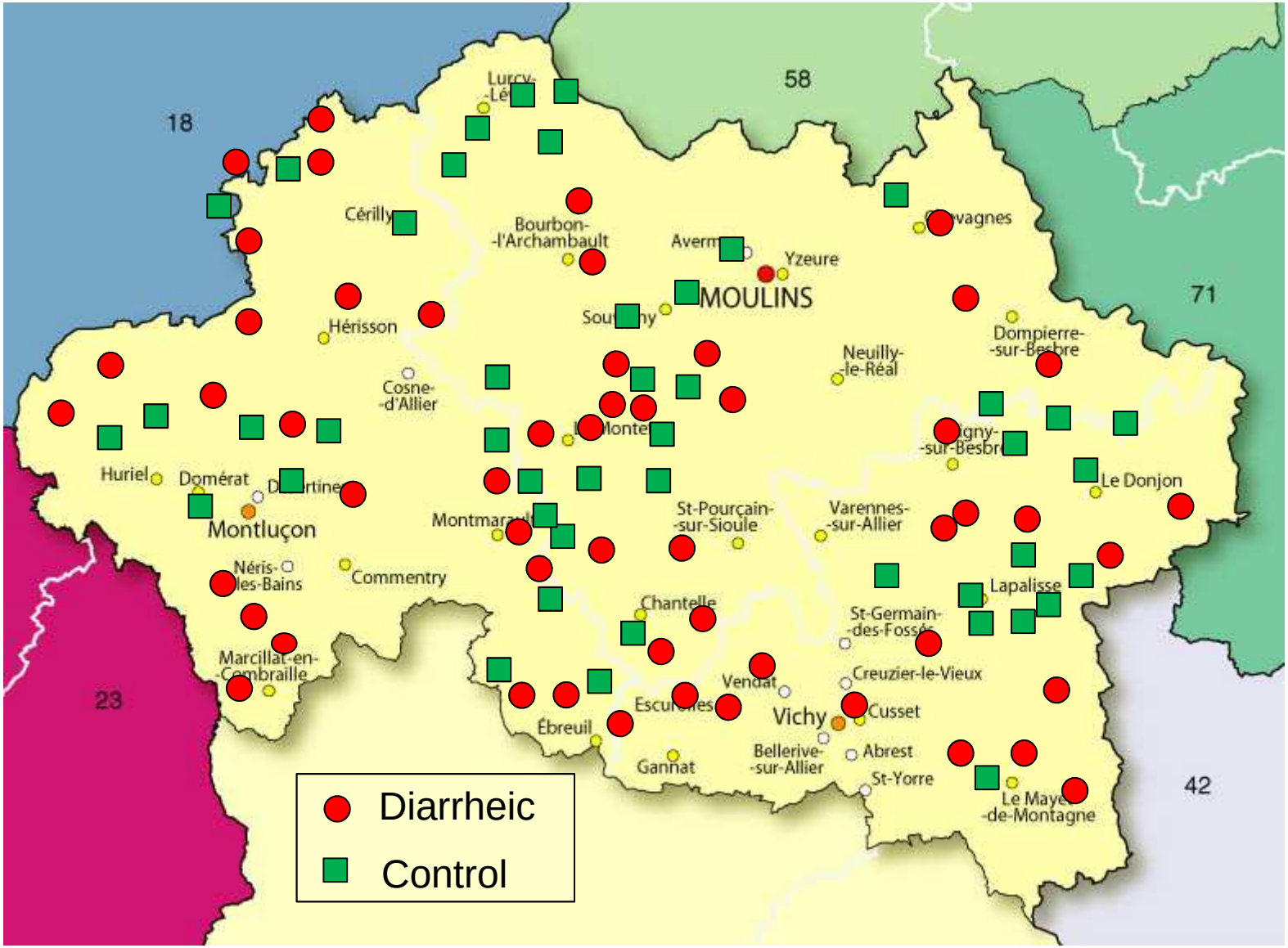
- Updated knowledge on
  - the prevalence of pathogens responsible for calf scours in cow-calf herds in Center of France (Allier)
  - the types of *E. coli* isolated from diseased calves
  - the antimicrobial resistance exhibited by these isolates
  - *risk factors contributing to clinical outbreaks…*

Materials and methods

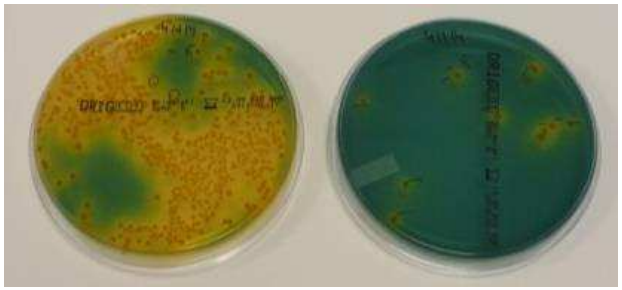
- 17 vet rural practices (voluntary basis)
- <8-day-old calves
  - 125 diarrheic calves (no Ab treatment)
  - 61 control calves (in herds without any experience of diarrhea during the calving season)
- Samples: feces + blood (dry-tube)

- + *Questionnaires filled in by farmers + vets*

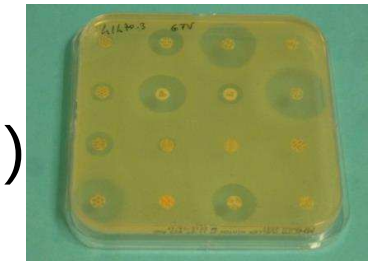
Materials and methods



Materials and methods cont'd



- Analyses:
  - On faeces:
    - ELISA (rotavirus + coronavirus)
    - Direct observation of ookysts (*Cryptosporidium*)
    - Isolation, enumeration, identification and typing (F5/F17/F41/CS31A + antibiograms*) of *E. coli*
  - On blood
    - Serum IgG1 dosage (radial immunodiffusion)

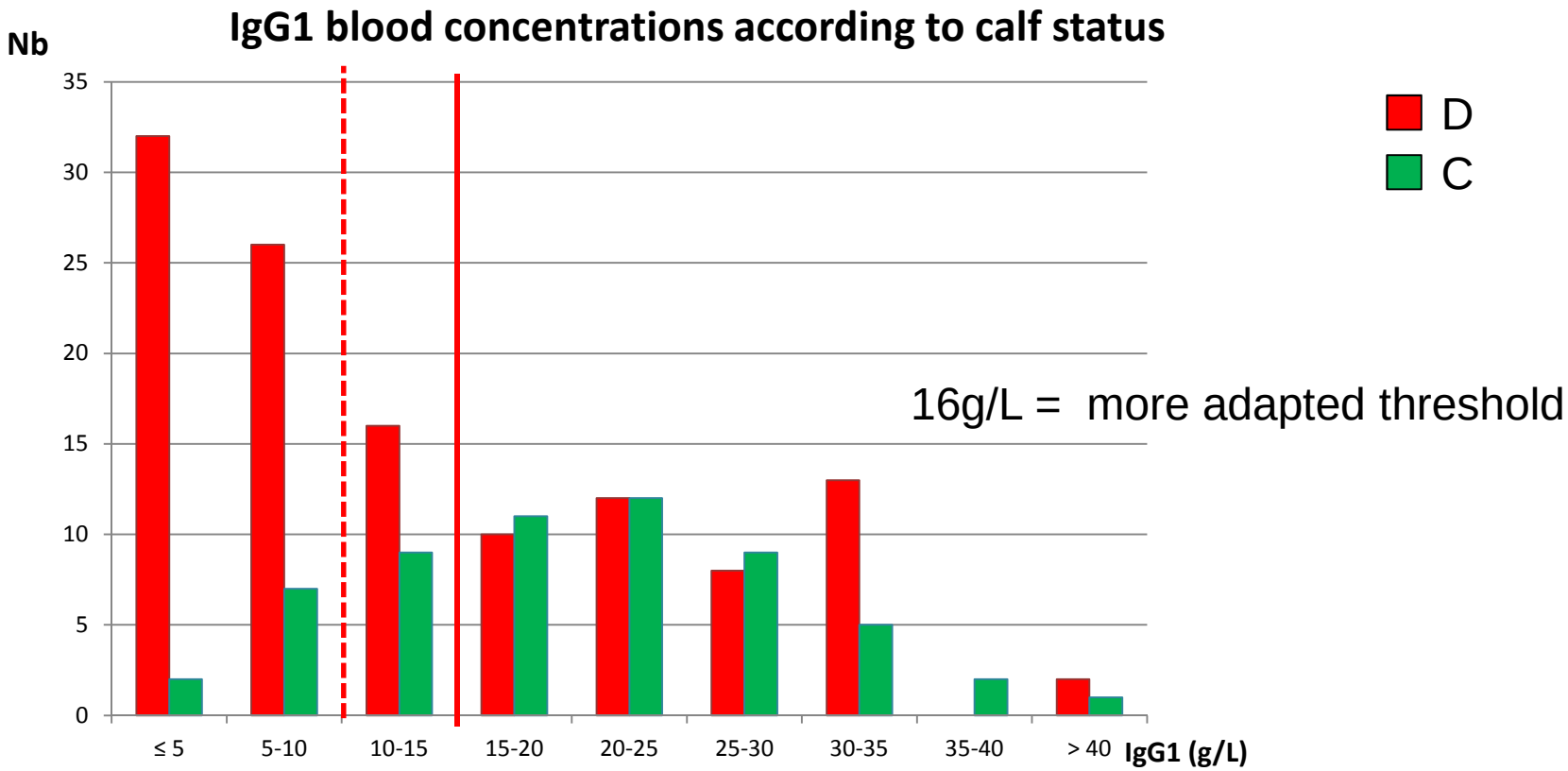


According to CA-SFM recommendations (2010) : 16 antibiotics = amoxicillin, amoxicillin + clavulanic acid, cefalexin, cefoxitin, ceftiofur, cefquinome, streptomycin, kanamycin, gentamicin, neomycin, tetracyclines, colistin, sulfonamides + trimethoprime, nalidixic acid, enrofloxacin and marbofloxacin

Results

- IgG1 blood concentration:
  - in diseased calves 14,4 +/-10,0 g/L
  - in control calves 20,0 +/- 8,8 g/L

p = 0,0002



16g/L = more adapted threshold

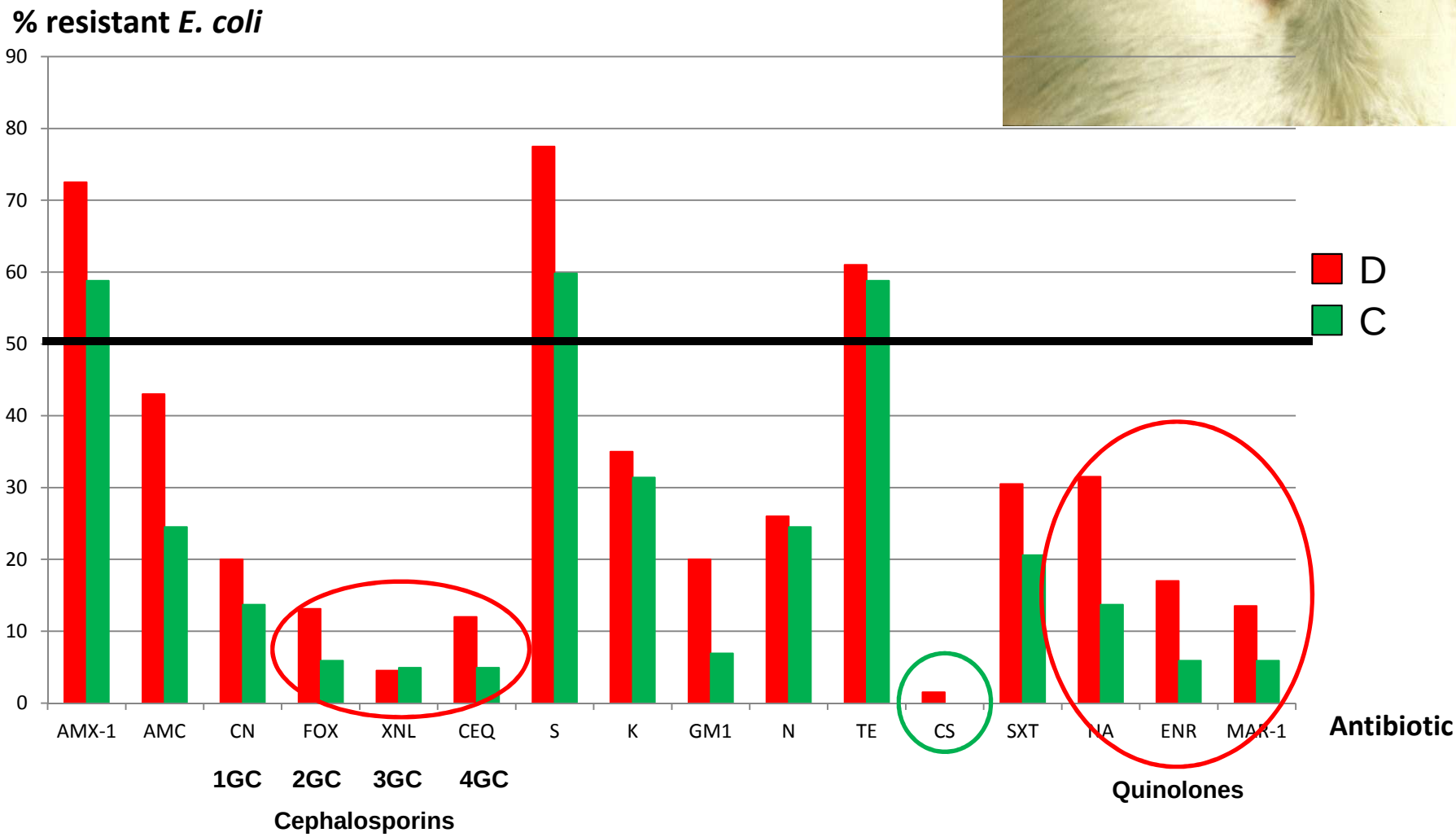
Results

- Pathogens
  - Rotavirus : 18,4 % D vs 3,4 % Controls (p = 0,005)
  - Coronavirus : 24,0 % D vs 3,3 % Controls (p = 0,0003)
  - *Cryptosporidium* : 24,8 % D vs 0,0 % Controls (p = 2.10^{-5})
  - *E. coli* : in all calves except one (1 ill calf); total number of 310 isolates (203 in diseased calves vs 107 in controls)
- Associations! in 52,8 % Diseased vs 6,6 % Controls (p = 0,0002) :

	D		C	
***E. coli* only**	58	46,4 %	57	93,4 %
E. coli* + *Cryptosporidium	19	15,2 %		
***E. coli* + coronavirus**	18	14,4 %	2	3,3 %
***E. coli* + rotavirus**	14	11,2 %	2	3,3 %
E. coli* + coronavirus + *Cryptosporidium	6	4,8 %		
***E. coli* + rotavirus + coronavirus**	5	4,0 %		
E. coli* + rotavirus + *Cryptosporidium	3	2,4 %		
***Cryptosporidium* only**	1	0,8 %		
E. coli* + rotavirus + coronavirus + *Cryptosporidium	1	0,8 %		

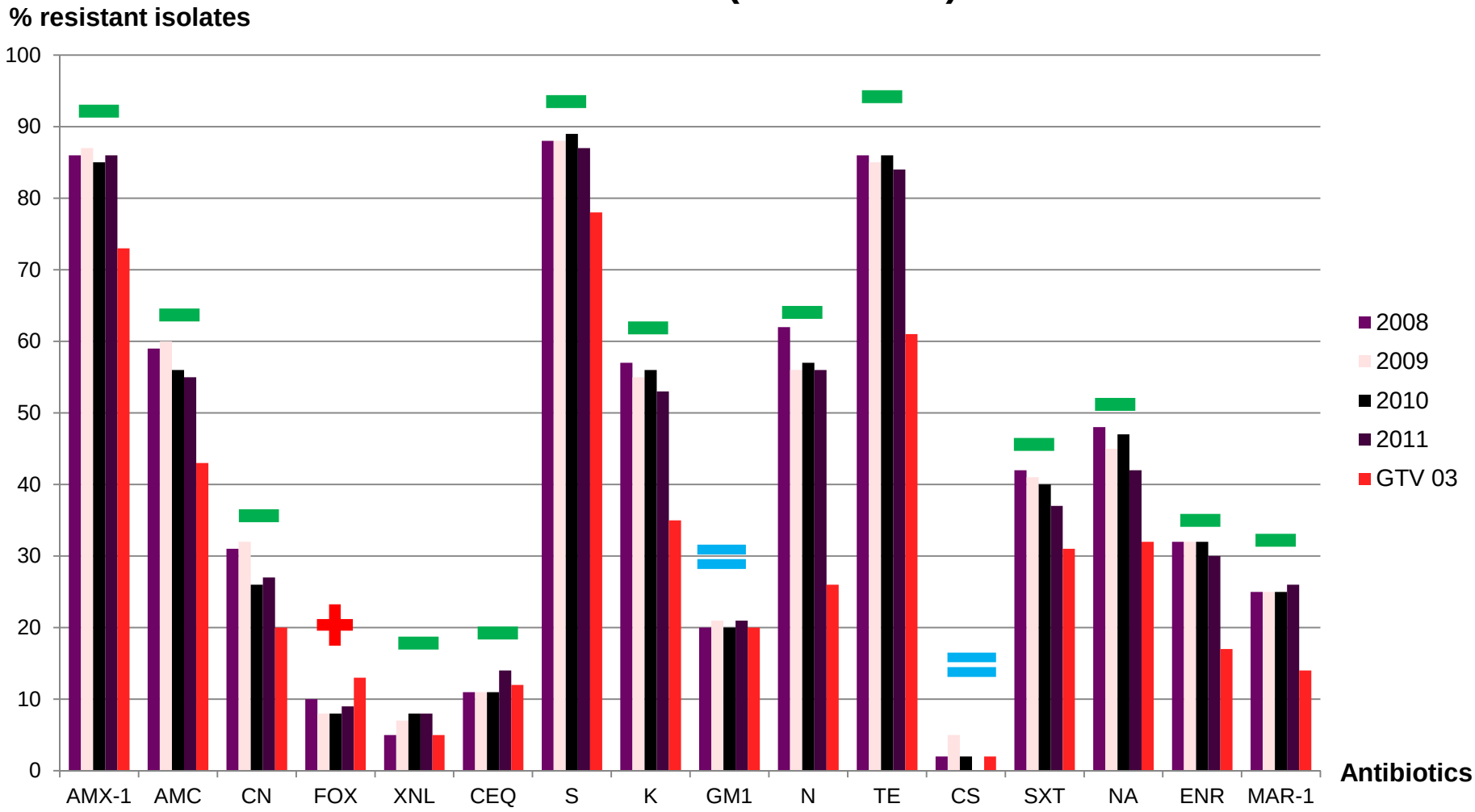
Results

Proportion of resistant *E. coli* according to the calf's status



Results

Proportion of resistant *E.coli* isolated from young bovines in France (RESAPATH)

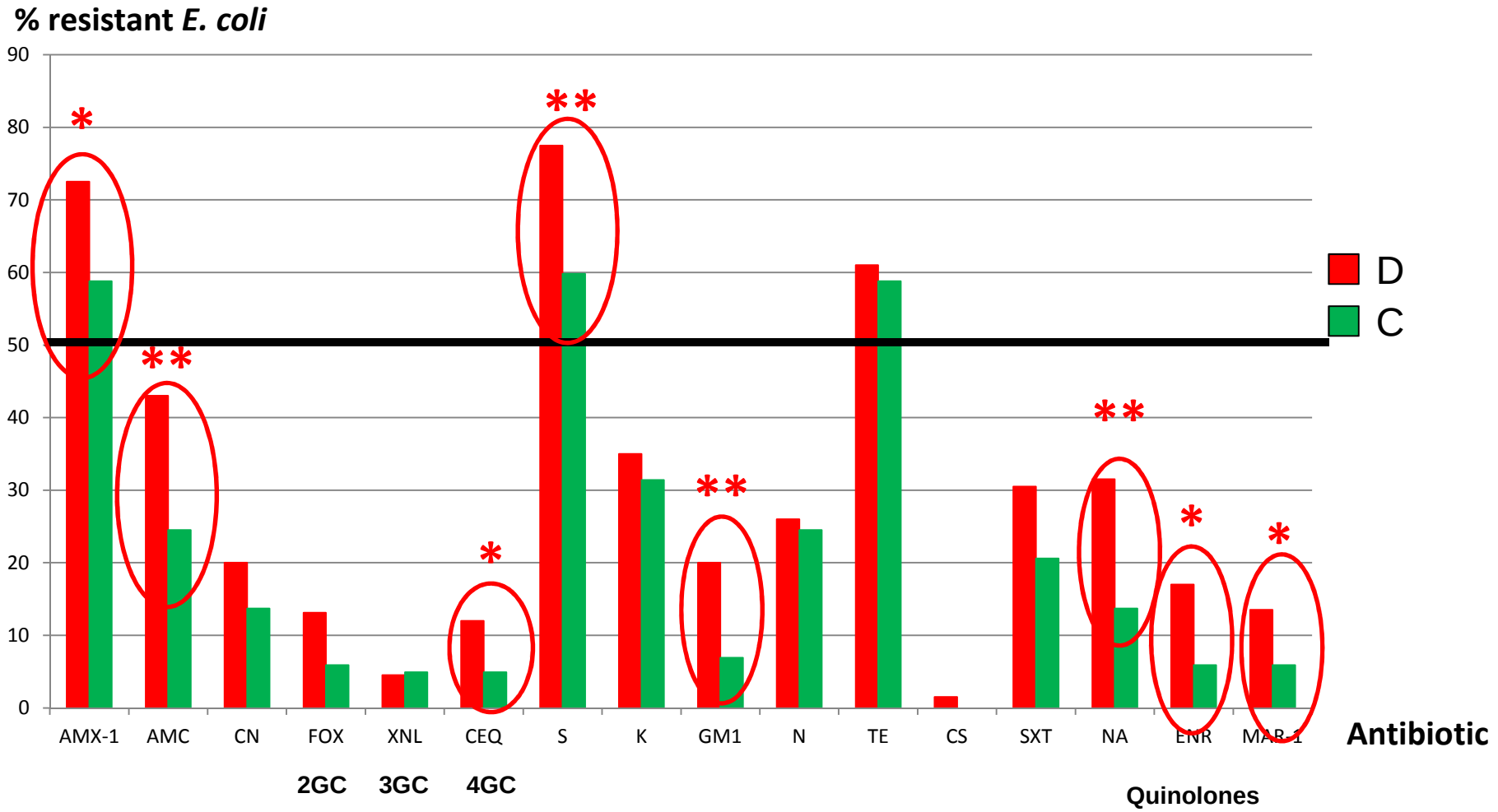


References: Chazel *et al*. (2009), Chazel *et al*. (2010), Chazel *et al*. (2011) and Jarrige *et al*. (2012)

Results

*: p<0,05
* *: p< 0,005

Proportion of resistant *E. coli* according to the calf's status



Results

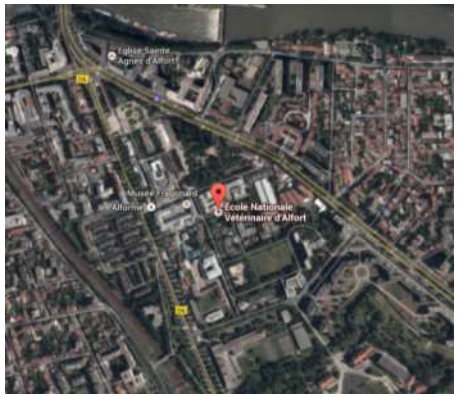
*: p<0,05

- Differences observed according to practices

% resistant isolates	Vet practice nb. 1		Vet practice nb. 2	
	D	C	D	C
Cefalexin	20%	7%	17%	29%
Cefoxitin	15%	7%	7%	0%
Ceftiofur	0%	0%	0%	0%
Cefquinome	0%*	0%	28%*	0%
Gentamicin	0%*	0%	28%*	14%
Neomycin	40%	43%	17%	14%
Sulfonamides + Tmp	20%*	14%	44%*	14%
Nalidixic acid	15%	7%	28%	0%
Enrofloxacin	5%	0%	11%	0%
Marbofloxacin	5%	0%	6%	0%

Conclusions

- Slightly lower prevalence of AB resistance in this « département »
- Significant differences between affected and control herds
- Significant differences between vet practices
- Efforts to continue, improvements awaited




Thank you for your attention
Any question?