ANTIMICROBIAL RESISTANCE IN URUGUAY:
PREVALENCE ESTIMATION IN BEEF CATTLE AND FARMS IN DIFFERENT PRODUCTION SYSTEMS

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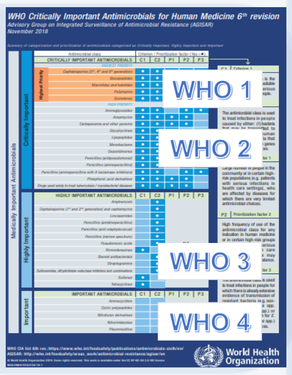
INTRODUCTION and OBJECTIVES

In Uruguay, the last study about prevalence of antimicrobial resistance (AMR) in different production systems dates from 2006, with changes in the productive system. Therefore, the objective of this study was to estimate the prevalence of AMR and study the profile of susceptibility to antimicrobial agents at a National level in beef cattle prior to slaughter.

The results at animal and farm level were categorized according to the different number of resistant categories, if at least one is resistant or by the condition with the greatest impact. Weighing the findings according to a One Health approach, the results were categorized according to the WHO criteria of importance.



MATERIALS AND METHODS

- The study was carried out with a two-stage sampling: 120 farms with different cattle production systems were selected (pasture-based beef cattle, feedlot cattle and dairy cattle); and then 10 steers within each herd.

- Antimicrobial susceptibility tests were performed on 1180 individual fecal samples, using *Escherichia* coli, non-selective media and an automatized equipment. The results were interpreted using clinical cut-off point.
- Laboratory data were combined with survey data collection to categorize results.
- To estimate the prevalence based on the sampling design, the complex sampling routine of STATA 15® software was used.

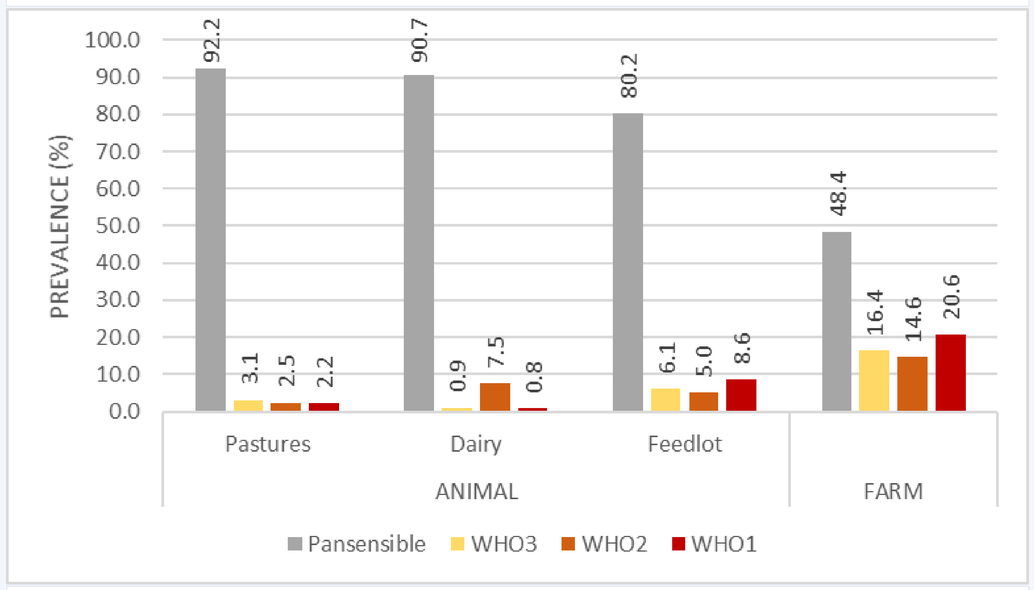
RESULTS

- 90.4% of the animals were pansensitive; 8.3% of the resistances were simple and 1.3% multiple; 6% were critically important antimicrobials according to WHO list, with higher resistances in strata feedlot.
- The most prevalent type of drug resistance was to tetracycline, followed by colistin and ampicillin.
- At the farm level, the drug resistance values were higher due to dispersion; 35% of the farms were resistant according to WHO list of critically important antimicrobials and 51.6% showed some resistance, with no strata difference. 1.82% of the farms were multidrug resistance.

Prevalence of AMR at animal and farm level according to the number of different antimicrobial categories:

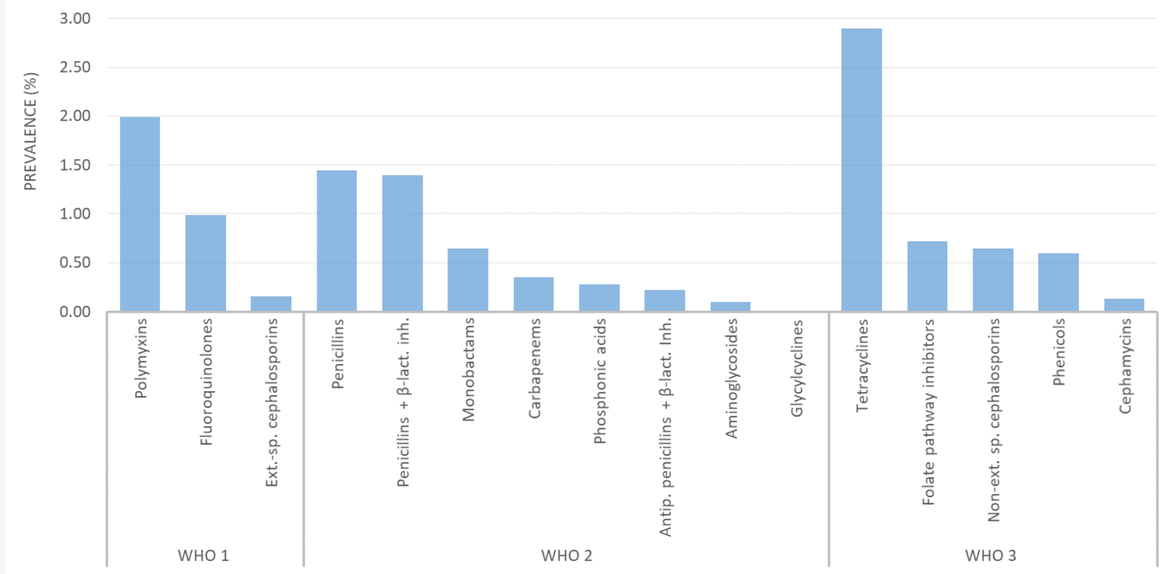
Resistance pattern	Prevalence (%)	
	ANIMAL	FARM
Pansensible	90.4	48.4
One resistance category	8.3	40.3
Two resistance categories	0.68	9.5
Multidrug resistance	0.64	1.8

Prevalence of AMR at animal and farm level according to WHO categorization of critically important antimicrobials:



WHO1: highest priority of the critically important antimicrobials; WHO2: high priority of the critically important antimicrobials; WHO3: highly important antimicrobials

Prevalence of AMR at animal level according to WHO categorization of critically important antimicrobials and antimicrobial categories:



WHO1: highest priority of the critically important antimicrobials; WHO2: high priority of the critically important antimicrobials; WHO3: highly important antimicrobials; Ext.-sp.: Extended-spectrum; β-lact. Inh.: β-lactamase inhibitors; Antip.: Antipseudomonal

CONCLUSIONS

Comparing the results with previous studies, they do not differ significantly which means the production systems still show high sensitivity to antimicrobials.

Our results indicate that the AMR prevalence in farms prior to slaughter is very low and it shows a dispersed distribution at farm level, compatible with limited antimicrobial use. Updates on the situation are essential for decision makers in public policies, to support and evaluate actions.

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