



Antibiotic residues traceability in livestock, wastewater and soil around the world

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Introduction

Antibiotics commonly used in veterinary medicine are a big problem today. Antibiotic residues may persist in foods derived from animals, and their persistence in wastewater and soil may pose adverse health effects for the consumer (Chanda et al., 2014; Riviere and Papich, 2013). Therefore, the objective of this study was to evaluate which residues of veterinary antibiotics are the most found in the world, in livestock products, waste water and soil.

Material and methods

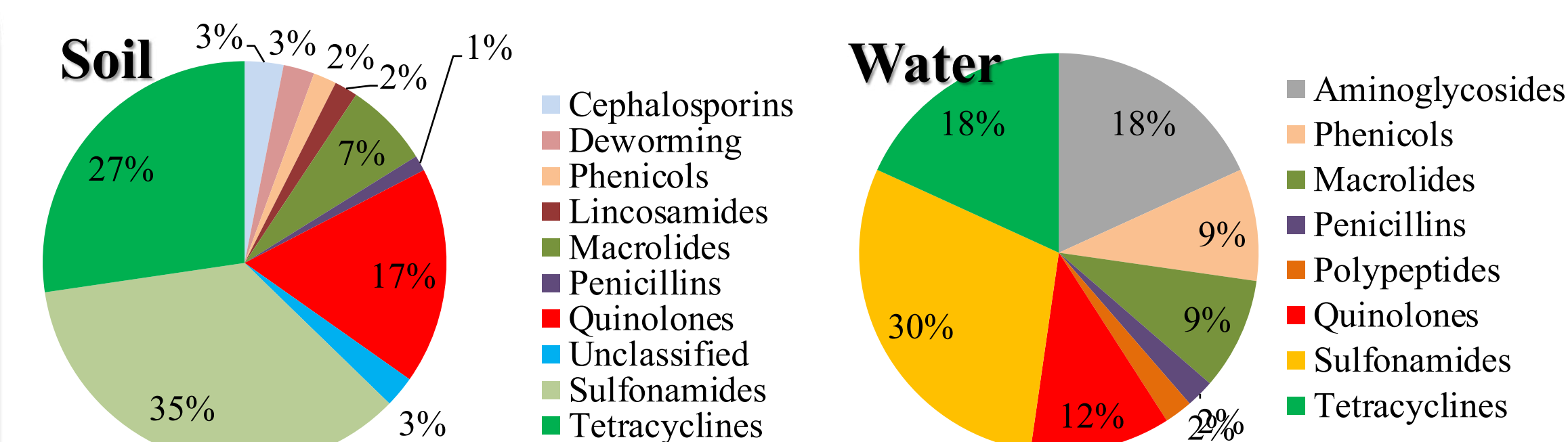
The search for information focused on studies of veterinary antibiotic residues founded in soil, wastewater and their bioaccumulation in tissues and animal products from around the world was performed. For which a database was created from the experimental studies published between 2000-2019.



Data from 140 studies were used (n=591), and it was analyzed according to the antibiotic family, percentage, place (water, soil, and/or animal species where it was found). Data analysis were performed as a percentage of incidence in each study.

Results

Veterinary Antibiotics as pollutants in animal products, wastewater and soil.



Discussion

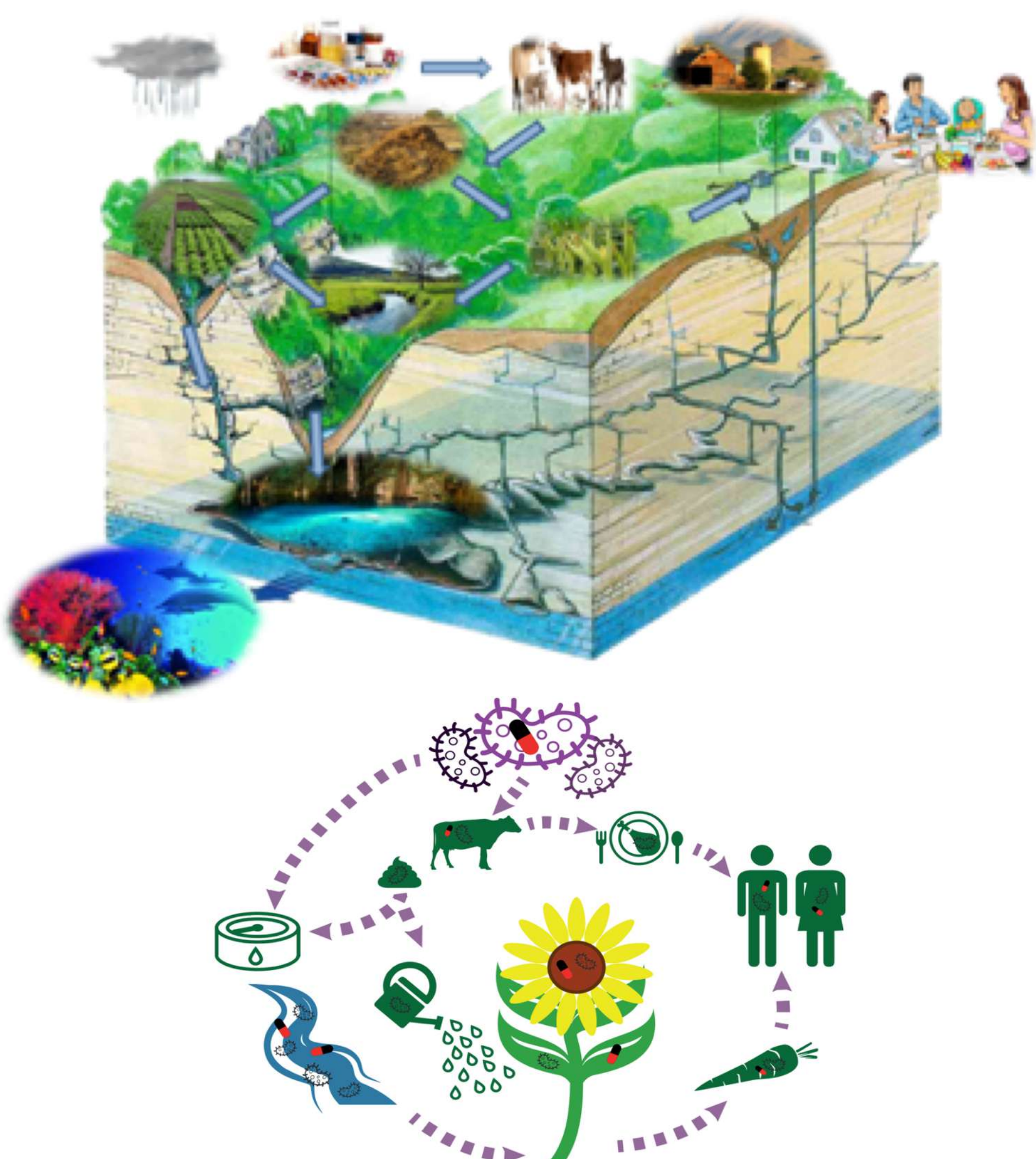
The main antibiotics residues (>70 %) in our database found in animal products (meat, eggs, milk), waste water and in soil were Sulfonamides (21-26%), Tetracyclines (19-29%), Penicillins (5-13%), Macrolides (5-11%) and Quinolones (14-21%). Antibiotic residues are still found in livestock products, waste water and soil, probably causing antibiotic resistance (FAO, 2020).

Conclusion

The use of antibiotics is now a major problem of environmental pollution reflected in livestock, water and soil. Rational administration of antibiotics and the use of feed supplements (exogenous enzymes, probiotics, prebiotics, etc.) are alternative solutions to reduce the excretion of these biologics into the environment.

References

- Chanda R, Fincham R, Venter P. 2014. Review of the Regulation of Veterinary Drugs and Residues in South Africa. Crit. Rev. Food Sci. Nutr. 54, 488–494.
- Riviere JE, Papich MG. 2013. Veterinary Pharmacology and Therapeutics; John Wiley and Sons: Hoboken, NJ, USA.
- FAO (2014). Codex Alimentarius : Maximum residue limits (MRLs) and risk management recommendations (RMRs) for residues of veterinary drugs in foods.



Results

Table 1. Antibiotics detected in soil, wastewater and animal products as percentage, found in the world (published papers).

Place	% Residues of antibiotics					
	Sul ¹	Tetra ²	Pen ³	Macrolides	Quinolones	Others*
Soil	21	29	13	7	12	18
Waste water	21	19	5	5	21	29
Livestock products	26	22	12	11	14	15

Sulfonamides¹, Tetracyclines², Penicillins³, *Others: Cephalosporins, Lincosamides, Phenicol's, Streptomycin.

