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 found 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.

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).

Discussion

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.

Conclusion

Highlights

- Antibiotic residues are found in livestock products, wastewater and soil.
- Sulfonamides, Tetracyclines, Penicillins are the most found antibiotics.
- Antibiotic residues can cause antibiotic resistance.

References

- FAO (2014). Codex Alimentarius : Maximum residue limits (MRLs) and risk management recommendations (RMs) for residues of veterinary drugs in foods.