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# Quantification of veterinary antibiotics in animal manure by liquid chromatography–mass spectrometry

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**V**eterinary antibiotics are used globally to treat disease and to protect the health of animals. Antibiotics that are frequently used in livestock are tetracyclines, sulfonamides and fluoroquinolones, which are active against gram-negative and gram-positive bacteria. After administration of antibiotics, 30–90% of the dose given is excreted in non-metabolized form or as active metabolites and as a result high levels of antibiotics and active metabolites are expected to be present in faeces. Currently land application of manures is common practice in many parts of the world, including Poland. Liquid manure is characterized by a high nutrient content making it valuable as a soil fertilize. However if animals are medicated, residues of the pharmaceuticals can frequently be detected in manure due to poor absorption of the respective substance in the animal gut or unmetabolized extraction. The residue levels of selected fluoroquinolones, tetracyclines, trimethoprim, tylosin and tiamulin in 30 animal dung and liquid manure samples and collected in 2018 from large-scale livestock in Poland. The sample preparation was made by using ultrasonic extraction with McIlvaine-Na<sub>2</sub>EDTA buffer solution and purified by SPE (Strata-X-CW cartridges) and analysed by HPLC-MS. Validation of the method was performed according to the guidelines indicated in European Commission Decision 2002/657/EC. Recoveries from

spiked pig and poultry dung and liquid manures samples ranged from 76.1 to 112.0% for all analysed antibacterial substances. Method quantification limits were in the range from 23.1 to 72.3 µg/kg for tetracyclines, fluoroquinolones, trimethoprim, tylosin and tiamulin. Analysis of 30 pig and chicken dung and liquid manure samples collected in Poland revealed that 11 samples were positive for the presence of doxycycline, enrofloxacin, oxytetracycline and tylosin. These analytes were detected in maximum concentrations reaching up to 4100 µg/kg (doxycycline).

## Biography

Ewelina Patyra has completed her PhD in Analytical Chemistry in National Veterinary Research Institute in Pulawy, Poland and Postdoctoral training in University Santiago de Compostela in Lugo Spain. She has worked in University of Life Sciences in Lublin, Poland and Laboratoire d'Etude des Residus et Constatants dans les Aliments in Nantes, France. Currently she works as an Assistant Professor in Department of Hygiene of Animal Feeding stuffs National Veterinary Research Institute in Pulawy, Poland. Her main subject of work is development of new analytical methods in detection of antibacterial substances in animal feeds and manure with the use of liquid chromatography techniques.

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