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Application of micellar liquid chromatography for determination of tetracycline antibiotics in medicated feeding stuffs with the use of HPLC-DAD

Ewelina Patyra and Krzysztof Kwiatek

National Veterinary Research Institute, Poland

Micellar liquid chromatography (MLC) is a branch of high – performance liquid chromatography. The applications of MLC for the determination of numerous compounds in pharmaceutical formulation, biological samples, food, environmental samples and feeds have been growing very rapidly. MLC technique has several advantages over other chromatographic techniques. Its main advantage is the small amount of organic modifiers used such as acetonitrile and methanol and the safety and recyclability of the mobile phase. This mobile phase was used for quantification of tetracycline antibiotics in medicated feed. These antibiotics are used for the treatment of different infection in pigs, chickens, turkeys and ducks. Since 2006, in European Union countries antibiotics in feed can be only in medicated feed. In this work, MLC was used for quantification of oxytetracycline (OTC), tetracycline (TC), chlorotetracycline (CTC), and doxycycline (DC) in medicated feeds. Feed samples were extracted with 0.01 M citric buffer/acetonitrile (pH 3.0). The purified extract was separated on Thermo column C18, 150×4 mm, 5 µm and detection was carried out at 360 nm for OTC and TC, 370 nm for CTC, and 350 nm for DC. TCs were eluted with a mobile phase of 0.03 M SDS/7% 1-butanol/0.02 M oxalic acid/NaOH at pH 2.5. This method provided average recoveries of

80.4% to 100.2%, with CVs of 0.5% to 6.6% in the range of 50 to 1500 mg/kg OTC, TC, CTC and DC in feeds. The linearity for the four TCs was determined by high performance liquid chromatography-diode array detector in the range 10–300 µg/mL (50–1500 mg/kg), with a linear correlation coefficient (R)>0.99. The LOD and LOQ for TCs in pig and poultry feeds ranged from 4.0 to 10.7 and 4.7 to 12.6 mg/kg, respectively. The method was applied to the analysis of medicated feeds collected from poultry and pig farms.

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 Conataminants 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.

ewelina.patyra@piwet.pulawy.pl