

Abstract

Fluoroquinolones (FQs) are used for therapy and prophylaxis of human and animal diseases and they are also used as growth promoters of animals. The usage of antibiotic is in connection with development of antibiotic resistance among bacterial populations. Since swine production industry is considered to be a relevant source of antibiotic resistant bacteria, measures to control the use of antimicrobial agents in animal husbandry have been adopted in recent years (1).

The presence of FQs in wastewater from swine farms can introduce antibiotics in surface waters through agricultural runoff. FQs are rather resistant to microbial degradation and these compounds may be persisting within environmental waters because of their sorption properties, favouring the accumulation in sewage sludge, manure and soil (2).

To trace the sources and ways of contamination, and evaluate the environmental impact of an outdoor swine production system, the occurrence norfloxacin (NOR), ciprofloxacin (CIP) and enrofloxacin (ENRO) residues were evaluated in wastewater and surface water samples. A LC-FD method based on the application of monolithic column (Chromolith Performance RP-18e (100 x 4.6 mm) successfully developed in previous studies (3,4,5) was applied. FQs were isocratically eluted using a mobile phase consisting of 0.025 M Phosphoric acid solution at pH 3.0 with tetrabutylammonium and methanol (90:10, v/v), at a flow rate of 2.2 mL/min, at an excitation and emission wavelengths of 278 and 450 nm respectively.

The limits of quantification (LQs) of these FQs, expressed as the lowest tested level with acceptable RSD was 25 ng/l. Recoveries yield of spiked samples ranged from 66.4% to 114%. Within-day accuracy and precision (expressed as RSD) data obtained were under 17%.

The method was successfully applied for determination of NOR, CIP and ENRO in water samples, collected from an intensive piggery, in Portugal.