Immunochemical determination of fluoroquinolone antibiotics in cattle hair: A strategy to ensure food safety

Food Chemistry (2014) 157, 221-228

Fátima Fernández[1, 2], Daniel G. Pinacho[1, 2], Marta Gratacós-Cubarsí[3], José-Antonio García-Regueiro[3], Massimo Castellari[3], Francisco Sánchez-Baeza[1, 2], M.-Pilar Marco[1, 2, *]

[1] Nanobiotechnology for Diagnostics group (Nb4D), IQAC-CSIC, Jorge Girona, 18-26, 08034 Barcelona, Spain.
[2] CIBER de Bioingeniería, Biomateriales y Nanomedicina (CIBER-BBN), Jorge Girona, 18-26, 08034 Barcelona, Spain.
[3] IRTA, Monells, Finca Camps i Armet, E-17121 Monells, Girona, Spain.

[*] Corresponding author: pilar.marco@cid.csic.es

Abstract

Enrofloxacin (ERFX) is a synthetic antibiotic of the fluoroquinolone (FQ) family, which is commonly administered in veterinary medicine. ERFX and its metabolite, ciprofloxacin (CPFX), have been reported to accumulate in hair of treated animals. Therefore, hair analysis is an attractive non-invasive alternative to control misuse of such antibiotic and to ensure food safety by preventing such food derived products arrive to the consumer. In this context, an immunochemical analytical protocol has been established to detect ERFX and CPFX residues in cattle hair samples. Unpigmented and pigmented hair were collected from ERFX-treated and non-treated calves, and the aqueous NH_4OH extracts were directly analyzed by ELISA, being possible to achieve limits of detection in the range of 10–30 μg kg^{-1}. A good concordance between HPLC and ELISA measurements was observed. The results demonstrate the potential of the immunochemical procedure reported here to rapidly screen and quantitate FQ residues in hair samples.