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Detection of seven β_2 -agonists in teeth by LC-MS/MS: preliminary results.

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Abstract

β_2 -agonists are powerful tocolytic (the only use permitted in cattle) and bronchodilator agents, but may also be administered as growth promoters to improve the production of lean meat increasing also the lipolytic activity. Although the European Union (EU), China and other Asian countries have banned the use of β_2 -agonists for growth promoting purposes (European Union, 2003), the United States of America (USA) authorised ractopamine as a feed additive for swine, cattle and turkey. These veterinary drugs, generally show high clearance rates in the conventional biological matrices, as well as urine, liver and muscle, making difficult their detection (Wu, 2014). For this reason, we suggested bovine teeth as a new unconventional matrix of accumulation in a more long-time window, for the detection of cimaterol, clenbuterol, isoxsuprine, mabuterol, ractopamine, salbutamol and terbutaline. In literature, the few studies on teeth are limited to human (Andra, 2015) and are absent for veterinary medicine. The samples extracted by a simple liquid extraction step with ethyl acetate:tert-butyl methyl ether (4:1, v/v) after washing and pulverization of teeth, through a ball mill, were analysed using a liquid chromatography tandem mass spectrometry (LC-MS/MS) confirmatory method validated according to the Commission Decision 2002/657/EC criteria (European Union, 2002). Teeth from 8 veal calves, administered per os with 80 mg day⁻¹ oral ractopamine for 32 days, and from seven random bovines from the food chain were collected at the slaughterhouse to test the suitability of this matrix. The results demonstrated ractopamine presence in teeth from the treated animals (average concentration 8.90 ng g⁻¹). Isoxsuprine was found in a control sample (13.67 ng g⁻¹), demonstrating the effectiveness of this matrix as a powerful tool to ensure illegal treatment.

References

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