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035 DETECTION OF BETA AGONISTS IN BIOLOGICAL MATRICES WITH LIQUID CHROMATOGRAPHY TANDEM MASS SPECTROMETRY (LC-MS/MS)

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Introduction: β-agonists are a group of drugs which are widely used in human and veterinary medicine as a bronchodilator, cardiotonic and tocolytic agent. Moreover, β-agonists have been illegally used as a growth promoter in meat-producing livestock, because they increase the muscle mass and reduction the lipid content of the carcass. The residues of these compounds in meat and meat products present a risk for public health. Due to their side effects in human health, the use of β-agonists, as a growth promoter has been banned by the European Union at 1996.The aim of this study was detection of β-agonists in biological matrices from domestic animals with LC-MS/MS method.

Material and Methods: Total of 55 analyzed urine samples from cattle, swine, sheep and goat and 36 meat samples from bovine, swine and poultry were collected during 2015-2016 as part of national monitoring residue plan. The samples were collected and delivered from authorized veterinary inspectors. The extraction method was done according to the method of National Reference Laboratory in Berlin. The analyses were carried out on the LC-MS/MS. The chromatographic separation was achieved on a Phenomenex C18 (2.6μm, 2.1x50 mm) column followed by tandem mass spectrometry using an electro spray ionization source in positive mode. Validation of the method was performed according to Decision 2002/657/EC.

Results: In validation process, decision limit (CCα), detection capability (CCβ), precision, recovery, repeatability, in-house reproducibility, matrix effects and specificity were studied. The obtained results for validation are in accordance with the internationally accepted ranges. The linear regression analysis showed good correlation with R^2 from 0.9859 for cimbuterol to 0.9955 for mabuterol. Three concentration levels of 0.5, 1.0 and 1.5 times the MRPL (Minimum required performance limits) were spiked in urine and meat, and the overall recoveries were between 84 % for cimbuterol and 118 % for ractopamine. The relative standard deviation was from 9.63 to 32.64 %. The obtained values for

CCα and CCβ were below MRPL. The analyses of the urine and meat sample showed that the β-agonists are not present in the samples.

Conclusion: The results of this study do not exclude the possibility o abuse of β-agonists in the future. Therefore it is still necessary to monitor thes substances as a food quality control measure. The method features were foun to be fit-for-purpose. Successful validation of the method according to th European Union requirements and its application to real samples demonstrate its efficiency for veterinary control of β-agonist in meat and urine.

Key words: β-agonists, urine, meat, validation, LC-MS/MS