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Validation of methodologies for the determination of pesticides and veterinary drugs in foods of animal origin by HPLC-QqQ/MS and GC-MS

Lucia Pareja, Rodrigo Souza, Agustina Muela, Verónica Cesio and **Horacio Heinzen**
Universidad de la República, Uruguay

Nowadays the usage of phytosanitary products and veterinary drugs is a widespread technique in the livestock production chain. Animals may become contaminated when treated with these compounds to rid them of insect pests or through exposure to contaminated water, feed or pastures. Moreover veterinary drugs are widely used for production enhancement, growth promotion and improved feed efficiency. Residues of these compounds in animal products like milk, meat or other organs (liver, kidney, fat) are of special concern due to the high consume of these products. In this way, the development of fast and cheap analytical methods for the simultaneous determination of pesticides and veterinary drugs residues is crucial. Although there are plenty of methods reported for the analysis of pesticides and veterinary drugs separately, few of them have shown to be suitable for their simultaneous determination. This work presents the development of different methodologies for the determination of veterinary drugs and pesticides in four matrices; bovine liver, muscle, milk and kidney. Depending on the matrix around 40 pesticides and 15 veterinary drugs were included in the scope of the method. Although the chemical composition of the selected matrices (differences in fat, proteins, carbohydrates and other metabolites content), is very complex, two straightforward methods based in a miniaturized solvent extraction followed by a dispersive purification step and HPLC or GC coupled with MS or MS/MS analysis, allowed the multi-residue determination of the selected contaminants. The methodologies that presented the best results were chosen for validation according to SANTE/11945/2015 guidelines. In general, most of the selected compounds presented acceptable percentages of recovery, repeatability and reproducibility. Linearity, matrix effect, limits of detection and quantification were also evaluated. Additionally, a co-extractive study was performed by HPLC-QqLiT/MS in Enhanced MS mode (EMS) and GC-MS in full scan mode.

Biography

Lucía Pareja has expertise in the evaluation of pesticides and veterinary drugs by liquid chromatography and gas chromatography coupled to mass spectrometry. Her PhD studies were related to the development of analytical methodologies for the determination of pesticide residues in rice ecosystem. She has received a Doctoral scholarship at the University of Almeria in Spain, to work in pesticide residue analysis with Dr. Amadeo Rodriguez Fernandez-Alba. She is a Professor in Universidad de la República in Uruguay. She is the co-author of two book chapters and more than 15 articles published in international journals.

lpareja@fq.edu.uy

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