

DETERMINATION OF MULTI-CLASS VETERINARY DRUGS IN CHICKEN FEED BY ULTRA PERFORMANCE LIQUID CHROMATOGRAPHY TANDEM MASS SPECTROMETRY

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The use of veterinary drugs including antibiotics has received global attention in recent years especially due to the development of antimicrobial drug resistance. It is essential that suitable methods of analysis are available to control this problem. A multi-class method for the determination of 31 veterinary drugs belonging to 10 different classes in chicken feed has been developed. The method was based on QuEChERS (quick, easy, cheap, effective, rugged, and safe) extraction. The sample preparation included ultrasonicated with the mixture of acetonitrile, methanol and McIlvaine buffer followed by phase separation with MgSO₄:NaCl addition. The detection and quantification were performed using single analytical run by ultra-performance liquid chromatography coupled with electrospray ionization and tandem mass spectrometry (UPLC–ESI–MS/MS) operating in both positive and negative multiple reaction monitoring (MRM). The chromatographic separation was performed on a C₁₈ column using methanol and 0.2 mM ammonium acetate in water (pH5) as the mobile phase. Validation was performed in accordance with the international guidelines. Acceptable results regarding linearity of the method, limit of detection (LOD) and limit of quantification (LOQ) were achieved for 23 of 31 investigated substances. The LOD and LOQ of all drugs were 0.05 – 1.12mg/kg and 0.17 – 3.74mg/kg, respectively. Average analyte recoveries ranged from 66.7 to 119.1%, and the repeatability was in the range of 0.74 to 20.74%. The validation results demonstrate that the described LC-MS/MS method provides sensitive, repeatable and reliable for safety monitoring and controlling veterinary drug use in chicken feed.