

Pharmacokinetic parameters of moxidectin residue in the serum of lambs

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The pharmacokinetic parameters of moxidectin in the serum of meat lambs after following a single subcutaneous were investigated. The experiment was performed at the Laboratory of Production and Research for Sheep and Goats (LAPOC), Federal University of Paraná (UFPR), Brazil, between November to December 2011. Four females and three no castrated male, weaned, with 112 days age and 35 kg initial of body weight were feedlot in individual pens with slatted floors, equipped with individual feeders and drinkers. Diet was composed of 70% corn silage and 30% concentrate (20% CP), according to NRC (1985) recommendations, and supplied ad libitum. Each animal received moxidectin (Cydectin®, Fort Dodge International) either subcutaneously as a 1 % injectable solution or as a 0.1 at a dose rate of 0.2 mg. kg⁻¹ body weight according to the manufacturer's recommendations. The dose was calculated individually based on the weight after 12 hours of solids fasting. Blood samples (1.5 mL) were collected in vacutainer tubes to each animal at the following times: 1; 18; 24; 30 and 36 hours, 2; 3; 5; 9; 14; 21; 28; 35 and 42 days. Samples were centrifuged at 2500 g for 15 min, and serum was stored at -20 °C until analysis. The analysis to identify and quantify moxidectin residue levels in serum of lambs was performed at the Laboratory of Food Toxicology, University of Campinas (UNICAMP), Brazil. The validated analytical method presented between 80 to 107.3 % of accuracy and 1.7 to 6.7% of precision. This method was based on acetonitrile extraction, extract cleanup by dispersive solid phase using primary and secondary amine (PSA) plus octadecyl (C18), and analysis by liquid chromatography coupled with mass spectrometry (LC-ESI-MS/MS). The limits of detection and quantification were 2.0 ng mL⁻¹ and 5.0 ng.mL⁻¹, respectively. The results of the validation parameters showed that the method was suitable to determine the presence of MOX in the lamb serum. The pharmacokinetic study showed C_{max} value of 8.5 ± 2.81 ng mL⁻¹, and T_{max} of 1 day. The area under the concentration-time Curve (AUC_{0-∞}) and the T_{1/2} were 82.42 ± 8.02 ng day mL⁻¹ and 7.66 ± 1.62 days, respectively. The results indicated a slow moxidectin subcutaneous absorption and, therefore, increased systemic exposure time and low availability of the drug in blood circulation, when compared to other species such as goats or cattle, or to ivermectin.

Keywords: anthelmintic, persistence, sheep, serum concentration, subcutaneous administration

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