

Monitoring of Ivermectin residues in bovine and pig tissues

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Argentina is traditionally a beef-producing country. However, in recent years, pig production has grown exponentially. Due to technological advancements and economic factors, consumer preferences have shifted. Animal production systems are closely linked to the use of veterinary drugs for the prevention, control, or treatment of parasitic diseases. Consequently, if good agricultural practices are not followed, products from these productions could contain residues above the Maximum Residue Limits (MRLs). In this context, ivermectin (IVM) is one of the most widely used drugs to treat parasitic diseases. This study aims to conduct an exposure assessment and risk characterization for IVM residues in bovine and pig tissues intended for local consumption in Buenos Aires province (Argentina). Anonymous surveys were conducted to determine the population's consumption habits. Additionally, samples of beef, bovine fat, bovine liver, bovine kidney, pig meat, and pig fat were collected. The samples were analyzed by HPLC with a fluorescence detector. Considering that the tissues involved are not consumed raw, the stability of IVM residues during boiling, grilling, and baking was evaluated. Finally, using @Risk software, IVM prevalence, residue concentrations, residue stability during cooking, and bovine and pig tissue consumption were modeled to predict the probability of consuming tissues with IVM residues above the Acceptable Daily Intake (ADI). Of the 691 samples analyzed, 13.7% had quantifiable drug residue levels, and 1.9% had residue concentrations exceeding the MRL. The mean IVM concentrations (range) were 42.18 (0.11–587.15), 31.66 (2.96–283.33), 162.61 (1.32–516.55), 22.78 (1.51–65.40), 15.26 (0.07–194.25), and 22.14 ppb (1.58–126.76) for beef, bovine fat, bovine liver, bovine kidney, pig meat, and pig fat, respectively. Although cooking methods did not destroy IVM residues, fortunately, the probability of consuming bovine and pig tissues with IVM residues above the ADI was negligible. Therefore, IVM residues in tissues did not represent a risk to consumer health.

Ivermectin residues; Exposure assessment; Bovine tissues; Pig tissues.