Research project IZS VE 14/11

Depletion study to evaluate the persistance of carbadox and olaquindox metabolites in rabbit tissues by feeding experiments

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Carbadox (CBX) and olaquindox (OLX) are antimicrobial drugs that have been used in swine feed for growth promotion and for the control of dysentery and bacterial enteritis. Within the EU the use of CBX and OLX were banned since 1998, due to health concerns for possible carcinogenic, mutagenic and photoallergenic effects of these drugs and some of their metabolites. In Italy these drugs seem to have been illegally used for the control of dysentery and bacterial enteritis in rabbit farms as evidenced by the results of national monitoring plans, and for this reason in 2010 the Ministry of Health introduced the control of rabbit muscle within the new Italian monitoring plan. Actually Italy represents the most important European producer of rabbit meet with 50% of the overall European production.

Depletion studies conducted in swine have shown that CBX is readily transformed in various metabolic products, some of which were recognized as carcinogenic compounds (Desoxycarbadox, Hydrazine) and some others as non-carcinogenic ones (Quinoxaline-2 Carboxylic Acid). Analogous studies on OLX in swine demonstrated it is metabolised in several products of reduction, oxidation and hydrolysis among which the 3-methylquinoxaline-2-carboxilic acid (MQCA) is the most relevant residue in tissues. For years, QCA and MQCA were recognized as the main marker metabolites though recent depletion studies of CBX in swine, seem to confirm the presence also of desoxycarbadox in liver tissues even 15 days after the last administration of medicated feed. Published data on CBX and OLX metabolism are quite old and none of them was conducted on rabbits.

The goal of this project is to conduct a depletion study of CBX and OLX in rabbits to verify the presence in edible tissue of the most important metabolites and the persistence of the precursor molecule by a sensitive and robust analytical method and therefore to verify if QCA and MQCA can still be considered as the main markers to be searched to confirm an illegal treatment of rabbits with CBX and OLX.