

## **ABSTRACT**

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Pharmacology and Toxicology

**Student:** Dominika Sobotová

**Tutor:** PharmDr. Ivan Vokřál, Ph.D.

**Title of diploma thesis:** Pharmacokinetics of ivermectin in the sheep feces

**Key words:** ivermectin, pharmacokinetics, sheep, anthelmintic

Infection with internal parasites (endoparasites) is one of the most common diseases in sheep. Infection with these parasites mainly with the barber's pole worm (*Haemonchus contortus*) causes considerable economic losses and has a significant impact on sheep productivity. Anthelmintics, including ivermectin, are used for treatment. Ivermectin belongs to the class of macrocyclic lactones and is characterised by broad spectrum and low toxicity. On the other hand, it poses a risk to the environment in form of residues that are excreted in feces by treated individuals.

The aim of this study was to determine the excretion profile of ivermectin in sheep subcutaneously administered in a standard dose 0,2 mg/kg of body weight. UHPLC/MS/MS method was used for the analysis of ivermectin fecal concentration.

Based on the obtained results we determined basic pharmacokinetic parameters which includes time to achieve maximum concentration ( $t_{max}$ ), maximum concentration ( $c_{max}$ ), area under the curve (AUC) and mean residence time (MRT). We observed great interindividual differences and also characteristic pattern of excretion which was similar in all sheep.

The next objective was to determine whether ivermectin is equally distributed in the feces or whether its concentration varies. The analysis of ivermectin concentration in the exterior of the feces compared to the interior of the feces showed significantly higher concentrations. It is probably due to the excretion of ivermectin on the feces surface, contributing P-glycoprotein in its formation.