

# ABSTRACT

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Title of diploma thesis: Effect of ivermectin on the adults of *Haemonchus contortus*

Helminthiasis is a disease caused by helminth parasites including barber's pole worm (*Haemonchus contortus* – *H. contortus*) that causes haemonchosis. Haemonchosis is a serious disease harming small ruminant breeding and causing loss of productivity of animals, breeding weakening and ultimately death of the animals. Anthelmintics are widely used in struggle against the disease but frequent use in the past and present has led to developing drug resistance of the parasites. Increasing resistance against compounds with anthelmintic activity is becoming a worldwide problem. The effort is to know the resistance mechanisms and contributing factors which would prevent formation and expansion of the resistance. One of the most widely used substances of veterinary therapy of helminthiasis remains ivermectin (IVE). It is a macrocyclic lactone whose mechanism of action is likely damaging the parasite's chloride channels of glutaminergic synapses.

This project studies the effect of IVE on adults of two strains of *H. contortus*: the sensitive strain, called ISE (Inbred Susceptible Edinburgh) and the multidrug-resistant strain, called WR (White River), both isolated from the abomasum of infected sheep. The expression of selected genes that encode biotransformation enzymes of cytochrome P450 (CYP) family and UDP-glucosyl transferase (UGT) family after exposure to 1  $\mu$ M IVE for 12 or 24 hours was examined by quantitative PCR. Expression of these genes in affected worms was compared with a control group of untreated adults. Several significant changes were detected in the gene expression. More significant changes were detected in the sensitive strains after the action of IVE in comparison to the resistant strains, especially in males.