ABSTRACT

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Title of diploma thesis: Optimization of the method for viability testing in *Haemonchus contortus*

Barber´s pole worm (*Haemonchus contortus*) is one of the most widespread pathogenic nematodes of the Trichostrongylidae family parasitizing in the abomasum of small ruminants, mainly in sheep. The most common symptoms of haemonchosis are anaemia, lack of thriving and weight loss. Young animals can also die. A significant complication in the treatment of haemonchosis is the rapidly developing resistance of the barber´s pole worm to the administered drugs, which has become a global problem in recent years.

This work focused on testing the efficacy of benzimidazole anthelmintics (thiabendazole and albendazole) in three strains of barber´s pole worm, which differ in their drug sensitivity. We worked with strains: *ISE* (Inbred Susceptible Edinburgh) strain - sensitive, *IRE* (Inbred Resistant Edinburgh) strain - resistant and *WR* (White-River) strain - multi-resistant.

The egg hatch test (EHT) was used to monitor the drug effectiveness and thus to monitor the level of resistance. Eggs from individual strains were isolated from the faeces of infected sheep and incubated for 48 hours at the temperature 27 °C in a solution with different concentrations of anthelmintics. Hatched larvae and non-hatched eggs were firstly counted manually using a microscope. Afterwards, a machine learning method was applied to detect eggs and larvae of the barber´s pole worm. The two EHT evaluation procedures were then compared. The machine learning detection showed higher accuracy for eggs, but it performed lower in larvae due to their heterogeneous shapes. The resulting values of the inhibitory concentration (IC_{50}) of the individual strains confirmed the highest efficacy of the anthelmintics at the susceptible *ISE* strain and the lowest efficacy at the benzimidazole-resistant strain *IRE*.