

The role of MHC Class II DRA gene in resistance of sheep and goats to *Haemonchus contortus*

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The immune mechanisms of resistance acquisition by sheep and goats to gastrointestinal nematodes are still unclear. Both innate and adaptive responses protect the host from *Haemonchus contortus* infections. In this context, the major histocompatibility complex (MHC) represents one of the most polymorphic protein-encoding loci associated with the peptide-antigen binding in small ruminants and vertebrates. The need to respond to pathogens such as gastrointestinal nematodes that evade immune responses led to high allelic diversity observed at ovine MHC loci. The ovine MHC Class II DR Alpha (DRA) locus plays a central role in the immune system by presenting peptides derived from extracellular proteins and is considered less polymorphic. Thus, only three allele sequences have been reported in sheep with few non-synonymous substitutions. In order to identify substitutions associated with the control of nematode populations within the host, the detection of single nucleotide polymorphisms (SNPs) in the OLA-DRA20 gene was performed in sheep and goats experimentally infected with *H. contortus*. Animals from 3 different breeds of sheep and goats were used for the study during three years of evaluation. Animals were dewormed with levamisole (12.5 mg/kg of live weight) and albendazole (10 mg/kg of live weight). Each experimental animal was infected with 10,000 L3 of *H. contortus* per kg of body weight per oral route and fecal samples were obtained to determine fecal egg count. Blood samples were collected to evaluate blood package cell volume (PCV) and to isolate DNA using DNeasy Blood & Tissue Kit (Qiagen). One SNP in the OLA-DRA20 gene segregating in this population was analyzed using High Resolution Melting assays and three genotypes were observed (AA, GA, GG). A GLM was fitted with MPCV, DMI, ADG, specie, year, breed and genotype as predictors and a mean of FEC as the response variable. According to the results, the best significant predictors were Genotype, Breed (Species), Specie and Year ($p < 0.05$). In conclusion, the polymorphism in the OLA-DRA20 gene could have an important role in the immune mechanisms against *H. contortus* infections in sheep and goats.