

***PRNP* GENOTYPE PREVALENCE IN LATVIAN DARKHEADED SHEEP BREED**

Kristīne Grāve, Rita Granta

Pārtikas Drošības, Dzīvnieku Veselības un Vides Zinātniskais Institūts „BIOR”, Latvija
Institute of Food Safety, Animal Health and Environment - „BIOR”, Latvia
kristine.grave@bior.gov.lv

INTRODUCTION: Scrapie is fatal neurodegenerative sheep and goat disease, belonging to the group of transmissible spongiform encephalopathies (TSE). Cause of scrapie is infectious cellular protein isoform, originally encoded by *PRNP* gene. When connection between *PRNP* gene and susceptibility to disease was discovered, European Commission established special breeding programs aiming to eliminate scrapie-susceptible genotypes from sheep herds. Main sheep breed in Latvia is Latvian darkheaded (LD); and currently there is a lack of information about level of susceptibility of this sheep breed both to classical and recently discovered atypical scrapie strains. This work was carried out in order to investigate diversity of *PRNP* genotypes and evaluate susceptibility level to scrapie in Latvian Darkheaded breed (LD) sheep.

MATERIALS AND METHODS: Blood samples (n = 645) collected from randomly selected healthy LD sheep during annual state genotyping programmes from 2004 to 2011 were used in this study. Samples obtained in 2004 to 2007 were analysed for polymorphisms in *PRNP* codons 136, 154 and 171 using ASO probe assay. In 2008 standard method was changed to direct sequencing of part of *PRNP* gene including codons 136, 141, 154 and 171. In order to determine SNPs in desired codons, obtained sequences were compared with ovine *PRNP* gene wild type genotype (GeneBank accession No. AJ000739.1).

RESULTS: In total, regarding codons 136, 154 and 171, eight genotype variations were observed. Among them prevailing are ARR/ARQ (49.2%), wild-type ARQ/ARQ (23.9%) and ARR/ARR (14.7%). As for all four codons of ovine *PRNP* 13 different genotypes were found and three dominant genotypes were observed: ALRR/ALRQ (41.82%), ALRQ/ALRQ (23.9%) and ALRR/ALRR (21.7%). In turn, genotypes, most susceptible to classical and atypical scrapie are found to be in comparatively low frequencies; 4.3% for classical scrapie and 2.83% for atypical scrapie.

CONCLUSIONS:

Estimated level of susceptibility of Latvian Darkheaded sheep breed to classical and atypical (Nor98) scrapie strains are low;

Taking into account total level of resistance of predominant Latvian sheep breed, Latvia would benefit economically by helping to establish a fully scrapie resistant breed.