

## **Prion-like Doppel gene polymorphisms and scrapie susceptibility in portuguese sheep breeds**

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### **KEYWORDS**

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### **ABSTRACT**

The establishment of an association between prion protein gene (PRNP) polymorphisms and scrapie susceptibility in sheep has enabled the development of breeding programmes to increase scrapie resistance in the European Union. Intense selection for PRNP genotype may lead to correlated selection for genes linked to PRNP. We intended to investigate if any association exists between genetic variation in prion-like protein Doppel gene (PRND) and scrapie susceptibility, determined through PRNP genotyping. Sampling included 460 sheep from eight Portuguese breeds and the PRND gene coding region was analysed by multiple restriction fragment-single strand conformation polymorphism (MRF-SSCP), whereas PRNP genotyping was carried out by primer extension. A synonymous substitution (c.78G>A) was detected in codon 26 of the PRND gene, in all breeds except Churra Mondegueira. Linkage disequilibrium was found between the PRND and PRNP loci ( $P = 0.000$ ). Specifically, PRND was monomorphic in the 45 animals with the more resistant ARR/ARR PRNP genotype ( $P = 0.003$ ), whereas a higher frequency of PRND heterozygotes (GA) was associated with ARQ/AHQ ( $P = 0.029$ ). These results constitute preliminary evidence of an association between a polymorphism in the PRND gene and scrapie susceptibility, and indicate that the possibility of undesirable consequences from widespread selection for PRNP genotype on genetic diversity and reproduction traits needs to be further investigated.

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