

Characterization of the gene Melatonin Receptor 1A (MTNR1A) in the Rasa Aragonesa sheep breed: association with reproductive seasonality

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This work focuses on the characterization and evaluation of MTNR1A as a candidate gene related to reproductive seasonality in the Rasa Aragonesa sheep breed. MTNR1A has shown influence on reproductive seasonality in other breeds. Cyclic and non cyclic ewes for a given month were classified as a dichotomous variable coded with '1' and '0', respectively. The percentage of cyclic ewes between February and July 2009 was analyzed using a generalized linear model for categorical variables with repeated measures by the CATMOD procedure of SAS. The model used was $FC(ik) = \mu + \text{gene}(i) + \text{month}(k) + G \times M(ik)$, where $FC(ik)$ is the frequency of cyclic ewes with genotype(i) and month (k); μ is the overall mean percentage of cyclic ewes from the total set; $\text{gene}(i)$ is the effect of genotype(i) nested to the ram; $\text{month}(k)$ is the effect of the month, treated as a dichotomous repeated variable cyclic/non cyclic within 6 months of the experimental tests; $G \times M(ik)$ is the interaction effect. A significant effect was found between SNP606 of the MTNR1A gene and spontaneous out of season estrus behaviour. The T allele was associated with cyclicality in the Rasa Aragonesa breed. This finding, along with the fact that this polymorphism does not result in an amino-acid substitution, suggest that SNP606 may act in linkage equilibrium with a mutation in other genes responsible for out of season breeding. New polymorphisms (11 SNPs) in the coding region of the gene MTNR1A did not show any association for reproductive cyclicality during anestrus in the Rasa Aragonesa breed. Association between polymorphisms (17 SNPs) found in the promoter region and cyclicality is expected to be completed soon.