

**THEME 4 | GENETICS, GENOMICS, ANIMAL BREEDING AND REPRODUCTION**

**Single nucleotide polymorphisms in the CAPN1 and CAST genes associated to carcass traits in Santa Ines lambs**

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This study aimed to identify single nucleotide polymorphisms (SNP) associated carcass traits in Santa Ines lambs. Hot and cold carcass weights and yields, weights of neck, leg, ribs, shoulder and loin, carcass external length, leg length, chest width, rump width, rump girth, carcass conformation and fat scores were evaluated in a total of 185 lambs. Blood samples were used to sequence fragments of the CAST and CAPN1 genes, being found, respectively, 47 and 37 SNP with adequate genotype frequency distribution for use in association study. Statistical model used in the analysis was  $Y_{ijklm} = u + F_i + Y_j + M_k + \alpha_{ijklm} BW + \alpha_{ijklm} Age + A_l + D_m + e_{ijklm}$ , where  $Y_{ijklm}$  is the trait value,  $u$  is the global mean for the trait,  $F_i$ ,  $Y_j$  and  $M_k$  are fixed effects of farm, year and month of birth,  $\alpha_{ijk} BW$  is the body weight at slaughter covariate,  $A_l$  and  $D_m$  are additive and dominance fixed effects, respectively, and  $e_{ijklm}$  is the residual random effect. Significance level in the tests of hypotheses was 0.0089, obtained after multiple Bonferroni correction. Effects were found by leg length (g.42625797GGCCAG>GGCCAGCCAG, P=0.00169) and rib weight (g.42628421A>G, P=0.00603) in the CAPN1 gen. Additive and dominance values (Standard error) for g.42625797GGCCAG>GGCCAGCCAG were -3.1405(0.8753) and -3.8287(1.5908) respectively, while the g.42628421A>G had additive and dominance values of 0.2915(0.1086) and -0.5585(0.2169), respectively. The CAST gene had effect on chest width (g.93397718C>T, P=0.00863) and rump width (g.93397718C>T, P=0.00324). Additive values for g.93397718C>T was 2.9299(1.1052) for chest width and 1.5625(0.5245) for rump width. Dominance effect for g.93397718C>T was not significant. For the SNPs in the CAPN1 gene, the allele (GGCCAGCCAG) increase leg length, while the allele (A) increase rib weight. CAST and CAPN1 gene are more known by the effects on meat tenderness, but this study showed a new possible effect on carcass traits. That is the first study to identify polymorphism effect for morphometric carcass traits in sheep and the regions of leg and rib are important commercial cutting in sheep carcass.

**Keywords:** hair sheep, molecular markers, ovine, selection

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