

Association between the *GHR*, *GHRHR* and *IGF1* gene polymorphisms and milk coagulation properties in Sarda sheep

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Shortened version of the title suitable as a heading: *GHR*, *GHRHR*, *IGF1* genes and sheep milk coagulation

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Summary

The aim of the present Research Paper was to investigate if the variation of the sheep Growth Hormone Receptor (*GHR*), Growth Hormone Releasing Hormone Receptor (*GHRHR*) and Insulin-Like Growth Factor 1 (*IGF1*) genes were associated with milk coagulation properties (MCP) in sheep. The *GHR*, *GHRHR* and *IGF1* genes are part of the GH system, which is known to modulate metabolism, growth, reproduction, as well as mammogenesis and galactopoiesis in dairy species. A total of 380 dairy Sarda sheep were genotyped for 36 SNPs mapping to these three genes. Traditional MCP were measured as rennet coagulation time (RCT), curd-firming time (k_{20}) and curd firmness at 30 minutes (a_{30}). Modeling of curd firming over time (CF_t) was based on 60 minutes lactodynamographic test, generating a total of 240 records of curd firmness (mm) for each milk sample. The model parameters obtained included: the rennet coagulation time, as a result of modeling all data available (RCT_{eq} , min); the asymptotic potential value of curd firmness (CF_P , mm) at an infinite time; the CF instant rate constant (k_{CF} , % /min); the syneresis instant rate constant (k_{SR} , % /min); the maximum value of CF (CF_{max} , mm), and the time at achievement of CF_{max} (t_{max} , min). Statistical analysis revealed that variation of the *GHR* gene is significantly associated with RCT, k_{SR} and CF_P ($P < 0.05$). These findings may be useful for the dairy industry, as well as for selection programs.