Association of GH-gene polymorphism with milk yield and composition in Sarda breed goat

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1. Introduction

Growth Hormone gene (GH gene) is considered as a genetic marker to assess dairy production in ruminant species.

2. Message

The aim of this research was to identify GH-gene polymorphisms in Sarda breed goats and to evaluate the possible associations of this gene with quantitative and qualitative dairy production traits.

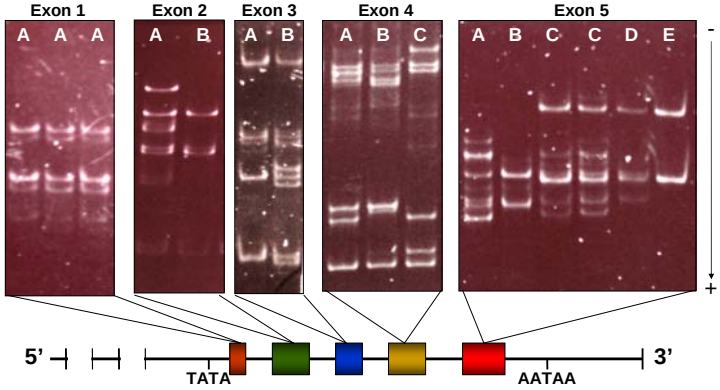
3. Methods

Twentyfour lactating goats, belonging to several flocks located in different areas of Sardinia, were studied. During the middle period of lactation, milk yield was registered and milk and blood samples were collected. Fat, protein and lactose levels were determined using the infrared assay. DNA was extracted from blood samples to investigate the five exons of the GH gene.

4. Results

The analysis was carried out using PCR-SSCP, and it revealed few polymorphism in exons 1 and 2 (one and two electrophoretic patterns respectively), five patterns in exons 3 and 4, and six different polymorphic patterns in exon 5. The comparative analysis (ANOVA) of the different polymorphisms with milk fat, protein, lactose and yield, pointed out a relation between some genotypes of exon 5 and milk yield ($P<0.01$), and some genotypes of exon 3 and milk fat ($P<0.05$). No significant relation was found between any exon pattern and milk protein and lactose levels.

Some SSCP patterns for exons 1-5 of Sarda goat GH gene separated by PAGE under non-denaturing conditions



Mean values for milk yield and composition associated with some PCR-SSCP patterns of GH exon 5 and 3

SSCP patterns	EXON 5						EXON 3			
	A (n= 6)		C (n = 4)		E (n=3)		A (n=4)		B (n=4)	
	MEAN	±SD	MEAN	±SD	MEAN	±SD	MEAN	±SD	MEAN	±SD
MILK YIELD (g/die)	975^{C}	35.5	660^{B}	22.7	520^{A}	42.5	595	68.5	580	72.5
FAT (%)	5.51	0.58	4.95	0.43	5.55	0.96	5.47^{a}	0.44	6.32^{b}	0.36
PROTEIN (%)	4.15	0.65	3.89	1.05	4.56	0.48	4.19	0.46	4.45	0.37
LACTOSE (%)	4.95	0.17	5.19	0.12	5.06	0.23	4.91	0.40	5.01	0.32

Means with different upper case letters are significantly different for $P<0.01$; with lower case letters for $P<0.05$.

5. Conclusions

The result, even though it comes from a preliminary study, indicates that also this locus has an high genetic heterogeneity in Sarda goat and it could be utilized as a genetic marker in selective breeding programmes.