



Molecular Tests for Milk Quality in Romanian Sheep and Goats

S. Kevorkian, M. A. Manea, S. E. Georgescu, A. Dinischiotu, M. Costache

University of Bucharest, Molecular Biology Center, Spl. Independentei 91-95, Bucharest 5, 050095, Romania.

INTRODUCTION

- the casein and β -lactoglobulin polymorphisms are important and well known due to their effects on quantitative traits and technological properties of milk
- there are evidence that indicate the ovine and caprine genetic polymorphism affect the physicochemical properties of milk
- the aim of this study was to analyze using PCR-RFLP and sequencing techniques the genotype distribution of β -lactoglobulin and α_1 -casein in Karakul sheep breed and Carpatina goat breed.

Material and Methods

- DNA isolated from sheep Karakul breed and goat Carpatina breed using Wizard Genomic DNA Extraction Kit (Promega)
- primer sequences were employed corresponding to β -lactoglobulin gene and α_1 -casein gene
- the restriction enzymes used were *RsaI* and *MboII*
- samples were analysed using the ABI Prism 310 Genetic Analyzer.

RESULTS and DISCUSSIONS

➤ PCR amplification for β -lactoglobulin resulted in a 120 base-pair fragment including exon II. Restriction fragment length polymorphism was evidenced after digestion with *RsaI* endonuclease; in particular two restriction sites (GT/AC) for allele A and only one restriction site for allele B were detected. In sheep we found animals with AA and AB genotype (Figure 1), while in goat we found only animals with AA genotype (Figure 3). To confirm our results we sequenced the genotypes (Figure 2 and 5).

➤ The β -lactoglobulin locus was found to have a significant effect on fat for the AA genotype and on whey protein content for AB genotype.

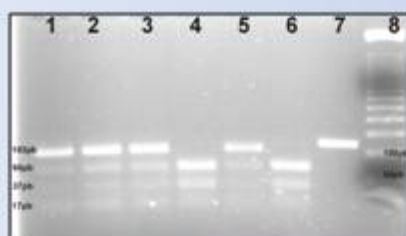


Figure 1: Restriction profiles for genotyping the β -lactoglobulin locus in sheep. Lane 1, 2, 3, 4: AB genotype; Lane 4: AA genotype; Lane 7: uncut fragment; Lane 8: 1kb molecular weight marker.

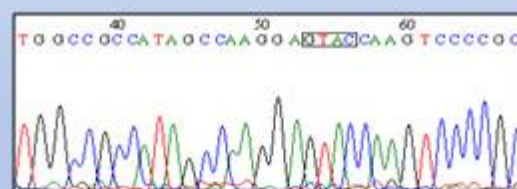


Figure 2: Partial sequence for an AA animal for β -lactoglobulin gene in sheep.

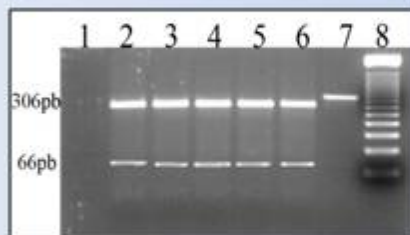


Figure 4: Restriction profiles for genotyping the α_1 -casein locus in sheep. Lane 1: negative control; Lane 2-4: nonA homozygote animals; Lane 7: uncut fragment; Lane 8: 1kb molecular weight marker.

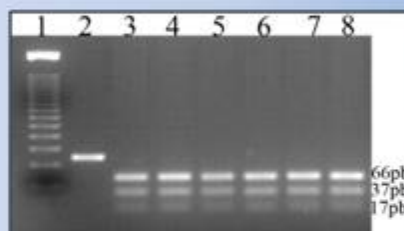


Figure 3: Restriction profiles for genotyping the β -lactoglobulin locus in goat. Lane 1: 1kb molecular weight marker; Lane 2: uncut fragment; Lane 3-4: AA genotype.



Figure 5: Partial sequence for an AA animal for β -lactoglobulin gene in goat.

CONCLUSIONS

- Our results show that the Romanian Karakul sheep presents a high degree of variability for this two genes that are involved in milk quality.
- In goat we obtained only one genotype for β -lactoglobulin gene.