# Polymorphism of the CSN2 gene in Sarda goat

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## Introduction

**In goat *CSN2* gene, six variants have been identified: A, A1, C and E, associated with a normal content of this protein in milk and 0 and 01, associated with a non-detectable amount.**

## Aim

**The aim was to evaluate allele frequencies of beta casein gene in Sarda goats, and their influence on milk traits.**

## Methods

**Blood samples were collected from 220 lactating goats and 80 bucks. Daily milk yield and composition were determined in goats. Individual genomic DNA was analysed by a PCR SSCP protocol that allows the simultaneous detection of the CSN2 A, C, E and 01 variants. Allele frequencies and HW equilibrium were analysed using the GenePop software package. GLM was performed to show the links between genotype and milk traits.**

## Results

**Results displayed the following genotype frequencies for all animals: AC = 45.12; CC = 36.70; AA = 13.47; C01 = 2.69; A01 = 2.02. The most frequent allele was C (0.606), followed by A (0.370) and 01 (0.024). No subject carried the E allele. For this locus the examined population was in HW equilibrium. Statistical analysis did not show significant differences between genotypes for milk traits, possibly due to the absence of the 01 allele in homozygosis.**

**Allelic and genotype frequencies in each sex**

| | *Goats* | *Bucks* |
|---|---|---|
| **Genotype frequencies** | | |
| **AA** | **15.45** | **7.50** |
| **AC** | **45.45** | **46.25** |
| **CC** | **35.91** | **37.50** |
| **A01** | **0.91** | **5.00** |
| **C01** | **2.27** | **3.75** |
| **Allelic frequencies** | | |
| **A** | **0.386** | **0.331** |
| **C** | **0.598** | **0.625** |
| **01** | **0.016** | **0.044** |

**Number of animals and mean value of milk traits associated with CSN2 genotype**

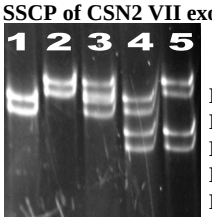
| | | Milk yield (g/d) | | Protein (%) | | Fat (%) | | Lactose (%) | |
|---|---|---|---|---|---|---|---|---|---|
| | n. | mean | s.d. | mean | s.d. | mean | s.d. | mean | s.d. |
| **AA** | **34** | **840.0** | **351.5** | **4.16** | **0.63** | **5.06** | **1.23** | **4.86** | **0.28** |
| **AC** | **100** | **835.6** | **390.0** | **4.21** | **0.53** | **4.98** | **1.26** | **4.89** | **0.28** |
| **CC** | **79** | **820.1** | **353.6** | **4.32** | **0.58** | **5.32** | **1.12** | **4.97** | **0.26** |

**PCR of CSN2 VII exon**


**M: marker 100 bp**

**Lane 1-4 374 bp**

**SSCP of CSN2 VII exon**




**Lane 1: AA**
**Lane 2: CC**
**Lane 3: AC**
**Lane 4: A01**
**Lane 5: C01**

## Conclusions

**Data shows that also in this casein fraction strong alleles prevail indicating good cheese making properties of the Sarda goat milk.**

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