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**Genetic polymorphism of the  $\beta$ -lactoglobulin gene in the proximal region in the Czech goat population.**

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**Summary**

*Beta lactoglobulin* ( $\beta$  – Lg), a major whey protein in milk of ruminants, is a globular protein belonging to the lipocalin family. The aim of this study was to evaluate genetic polymorphism of beta lactoglobulin gene in the proximal promoter region in the Czech goat breed using the PCR-RFLP method. Genetic polymorphism (nucleotide substitution) was detected at the position -60 (C  $\rightarrow$  T) and -341 (T  $\rightarrow$  C). The amplified fragment with sizes of 710 bp and 555 bp was digested by two restriction enzymes *Sma*I and *Fsp*BI, respectively.

**Introduction**

*Beta lactoglobulin* ( $\beta$  – Lg) is one of the main whey proteins in ruminant's milk. A globular protein belonging to the lipocalin family. This protein, besides in ruminants, has been observed in several other species (pig, horse, dog and donkey), but is absent in human, rodents milk and lagomorphs (Pérez & Calvo, 1995). In goats, no variants producing amino acid change have been characterized at the DNA level. However, polymorphisms in the 3'untranslated region (exon 7) and in the  $\beta$ -Lg proximal promoter region of Spanish and French goats have been described (Pena et al., 2000; Yahyaoui et al., 2000). Differences in  $\beta$ -lg content, ranging from 43% to 63% of major whey proteins, have been detected in milk from Italian Girgentana goats (Chianese et al., 2000). A polymorphism situated in the promoter region of individuals of this breed, with reduced  $\beta$ -Lg content, has recently been identified, but it was not correlated with the  $\beta$ —Lg content (Graziano et al., 2003).

**Material and methods**

We analysed a total of 114 goats belonging to White Shorthair (50, WSH) and Brown Shorthair (64, BSH) goat breeds. Genomic DNA was extracted from whole blood using the ABI PRISM 6100 analysis (Nucleic acid Prep. Station, Applied Biosystem, Co) according to standard protocol. The genetic polymorphism was typed using PCR-RFLP (Graziano et al., 2003; Yahyaoui et al., 2000).

## Results and discussion

Results of the molecular analysis of the goat  $\beta$ -Lg gene, (proximal promoter region) at positions -341 and -60, are presented in Table 1. Analysis showed variant *C* (0.71, WSH) and *T* (0.52, BSH) at position -60, as predominant. However, frequency of variants, *C* and *T* was balanced in BSH breed. In both goat breeds, variant *T* (0.90, WSH and 0.87, BSH) at position -341 was predominant. However, at the  $\beta$ -Lg gene, allele frequency are similar to those results are postulated by Ballester et al. (2005), Graziano et al., (2003).

Further work is in progress to evaluate the effect of these variants in the expression of the influence of the  $\beta$ -Lg gene on milk composition.

## Reference

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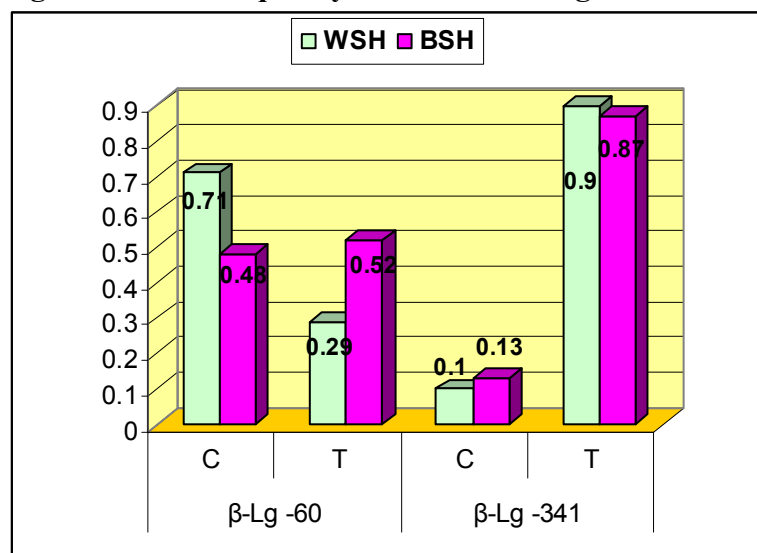
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**Figure 1 Allele frequency of the *Beta* lactoglobulin in the WSH and BSH**



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