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**O-AP-2****DNA SEQUENCE ANALYSIS OF DONKEY KAPPA-CASEIN (CSN3) GENE**

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Donkey's milk shows characteristics similar to human milk. As an example, compared to cow milk it shows less fat, ash, and proteins and more lactose and lysozyme and, consequently, it may be considered as a treatment of choice for children's allergies to cow's milk proteins. Till now few studies on the molecular characterization and analysis of the genetic variability of donkey casein genes were accomplished.

The aim of this work was to improve the characterization of donkey milk by sequencing the donkey CSN3 gene coding for milk k-casein, and to search for polymorphisms at this locus.

We sequenced the whole donkey CSN3 gene (11536 nt) (EMBL a.n. FR822990). Homology analysis between donkey and horse (GenBank a.n. NC\_009146.2) CSN3 genes showed similarities spanning from 97,3% (exon 1) to 100% (exon 2 and 3). Furthermore, this comparison showed, in donkey, an additional stop codon located 9 nucleotides upstream the horse one. As a consequence, the donkey k-casein protein is 3 amino acids shorter (182aa instead of 185aa) than that of horse.

Population analyses on 36 donkeys showed four polymorphic sites: a SNP (A/C) located in the promoter region (-405nt); two short insertions/deletions (8nt and 9nt, respectively) located at nucleotide 646 and 828 of intron 1 respectively; and a SNP(G/A) at nucleotide 55 of exon 4 responsible for an amino acid substitution Val → Ile. Only two (A-del-del-G; C-ins-ins-A) out of the sixteen possible haplotypes were identified. After the analysis of 20 horses, only homozygotes for haplotype C-ins-ins-A were observed.

This information will provide the basis for further studies in order to better assess the composition of donkey milk itself and the subsequent use both in human nutrition and in cosmetics.

Further research is needed to better characterize the κ-casein and, in general, the donkey milk casein fractions. In particular, since it is mainly a food used in hypoallergenic diet therapy of patients with milk protein allergy, a better knowledge of the milk proteins is necessary to better assess their immunological, physiological and nutritional characteristics.

Finally, considering donkey as a dairy animal could open new economic opportunities for this species and for the environment in which it is reared.