

## **TWO NOVEL TESTS BASED ON GENETIC POLYMORPHISMS FOR SPECIES IDENTIFICATION IN MILK AND MEAT PRODUCTS**

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Identification of the species of origin in animal derived-food has a remarkable importance because of the possibility of detecting fraudulent procedures, such as the substitution of one type of ingredient with a cheaper one or accidental adulteration. These facts are of concern particularly in relation with authenticity and labeling regulations which require accurate declaration of product compounds, adulterations and human adverse reactions (allergies).

The aim of this work was to develop two sensitive tests that allow to detect and quantify specie-specific genomic DNA from different animal species in a single assay using genomic DNA instead of mitochondrial DNA. A set of primer was designed in conserved region on the basis of the alignment of the genomic kappa casein sequences from the main milk-producing species (cattle, sheep, goat and water buffalo). Likewise a primer pair was designed in conserved region of the myostatin gene in chicken, turkey and pig. In both cases, alignment harvested single nucleotide polymorphisms (SNPs) that were confirmed and detected via minisequencing using extension primers designed in conserved sequences for haplotype determination that permits unambiguous assignment to each species.

The first method was successfully applied to the detection of the different analyzed species in raw and pasteurized milk as well as in mixed species cheese products from the retail trade, recovering genomic DNA from somatic milk cells that persist in cheese. The second method was successfully applied to the quantitative detection of species in meat mixtures such as sausages, wurstel and hamburgers made up with mixed chicken, turkey and pork meat.

Limit of detection (LOD) estimation was carried out using serial dilutions of genomic DNA first, and DNA isolated from milk of known number of somatic cells and meat in different species. The ability of detection resulted to be as low as 0,1% of bovine milk mixed with buffalo milk as well as with chicken and turkey meat.