

DEVELOPMENT OF A SNPs PANEL FOR BOVINE MEAT MOLECULAR TRACEABILITY

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There is an increasing interest towards the use of single nucleotide polymorphism (SNPs) for forensic applications. In the past, microsatellites have been the most widely used marker for individual identification and parentage determination however SNPs are now replacing them. SNPs are biallelic substitution sequence polymorphism occurring about every 100 – 500 base pairs and several technologies are now well established for SNPs genotyping (MALDI TOF assay, primer extension, TaqMan, and several microchip technologies). More recently the use of DNA marker have been proposed for meat traceability purpose. Traceability is defined by the European Regulation ER 178/2002 as the ability to trace and follow food, feed, and ingredients through all stages of production, processing and distribution. Applied to the meat industry, traceability relies on labelling system that ensure a connection between the individual animals and the cuts of beef. Conventional traceability consists of labelling system like ear tags, tattoos and electronic transponder. However after carcass disassembling, it is difficult to trace the identity of single cuts of meat through the distribution chain and risks of fraud are possible. In the last years, development in DNA technology, have made possible to implementing the conventional labelling system with DNA analysis, so improving meat traceability. Animals differ from each other's in their DNA; therefore, the genotyping of polymorphic sites provides an unique DNA fingerprint specific of an individual.. In the present work 63 SNPs located in 51 different gene were tested on 528 animals representing six cattle breeds. Allelic frequencies distribution and the power of discrimination was determined for each SNP. A panel of 18 highly informative SNPs have been selected. When used together the probability of error in sample assignment ranged from 1 out of 1.4 million to 1 out of 740 million, depending on the breed.