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Nero Siciliano pig: analysis of coat colour affecting genes and perspectives for breed traceability

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ABSTRACT

Nero Siciliano is an autochthonous pig breed reared in the internal areas of Sicily region mainly in the Nebrodi mountains. The animals are usually completely black with a dorsal stripe but a few present white portions mainly in the face or in the fore legs. According to the increased requests of the consumers for local and typical products, meat and cured products of Nero Siciliano pigs are sold at a higher price compared to other pig products. Thus there is the need to guarantee both consumers and the whole Nero Siciliano production chain from possible frauds. The identification and/or use of DNA markers that may be breed specific could make it possible to establish breed traceability and authenticity systems for the products obtained with this local pig breed. Mutations in coat colour genes have been already described and utilized for porcine breed traceability. In this trial we analysed mutations identified in two coat colour affecting genes, the melanocortin 1 receptor (*MC1R*) and the v-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene (*KIT*), with the aim to characterize the Nero Siciliano pig at these loci and provide useful information to establish authenticity systems for the meat products. Fragment analysis of PCR products and PCR-RFLP methods were used to identify the polymorphic sites that can distinguish known alleles at these two loci in 104 Nero Siciliano pigs. Four alleles were identified at the *MC1R* locus: the two dominant black alleles (*E^{D2}*, frequency of 0.673; *E^{D1}*, 0.187), allele *E^F* (0.106) and the recessive *e* allele (0.034). The results showed that different alleles were observed at this locus, polymorphisms at the *MC1R* gene cannot be used for product traceability and authentication of this breed. As regards the *KIT* locus, all the animals were negative for the splice site mutation of exon/intron 17. Thus, meat of Nero Siciliano pigs can be distinguished from meat of white pigs that are positive for this polymorphic site. Moreover, at this locus only 4 pigs showed the 3'-5' duplication breakpoint suggesting that they carried the *I^p* allele. Studies are in progress to evaluate the effect of this allele on coat colour phenotypes in Nero Siciliano pig.