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Alidation of microsatellite markers for individual identification and beef traceability in cattle

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Abstract : The objective of present study was to ascertain validation of microsatellite markers for individuals identification and beef traceability in cattle. A total of 59 random cattle samples(29 Korean native cattle and 30 dairy cows) was genotyped by using 11 microsatellite loci(BM1824, BM2113, ETH10, ETH225, EH3, INRA23, SPS115, TGLA122, TGLA227, TGLA53, and TGLA126). This method consisted of multiplexing PCR procedure and showed reasonable amplification of all PCR products. Genotyping was performed with an ABI 310 genetic analyzer. The number of alleles per locus varied from 5 to 11 with a mean value of 6.73 in the Korean native cattle(KNC), 4 to 9 with a mean of 5.91 in dairy cows(DC). Expected heterozygosity was ranged 0.534~0.855(mean 0.732), 0.370~0.866(mean 0.692) in the KNC and DC, respectively. PIC value was ranged 0.485~0.821(mean 0.684), 0.336~0.834(mean 0.640) in the KNC and DC, respectively. Of the 11 markers, 7 markers(ETH10, EH3, INRA23, SPS115, TGLA122, TGLA227, TGLA53) and 3 markers (INRA23, TGLA227, TGLA53) have relatively high PIC value (> 0.7) in the KNC and DC, respectively. The total exclusion probability of 11 microsatellite loci was 0.9997 and 0.9991 in the KNC and DC, respectively. A case of individual identification based on DNA marker analysis was presented. These results present basic information for developing a system for parentage verification and individual identification in the KNC and DC.

Key words : Allele, Korean native cattle, microsatellite DNA, parentage verification.