

INVESTIGATION OF SINGLE NUCLEOTIDE POLYMORPHISMS IN PORCINE CHROMOSOME 13

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Several studies reported quantitative trait loci (QTL) for growth rate, fat deposition, meat quality and reproduction traits on pig chromosome 13 (SSC13). NCBI SNP database (<http://www.ncbi.nlm.nih.gov/SNP/snp>) provided the data set to develop SNP markers on pig genome. A total of 5450 pig sequences were analyzed and 457 sequences containing 688 pig SNPs were matched to known human genes. Based on human and pig comparative radiation hybrid map (www.genome.iastate.edu), the 436 gene sequences were putatively mapped to pig linkage map. Of the 33 genes mapped SSC13, 27 PCR amplicons representing 25 genes were successfully sequenced for SNP characterization. A total of 38 SNPs were identified from the sequence comparison among five commercial pig breeds such as Berkshire, Duroc, Yorkshire, Landrace and Korean Native pig, an average of one SNP in every 265 bp. In contrast, NCBI SNP data base reported 58 SNPs, an average of one SNP in every 174 bp. Only 30 SNPs were found in both NCBI and our datasets and 8 SNPs were newly found in our result. The SNP markers are being used to characterize QTL on pig chromosome 13 and to clarify the relevance of SNP and quantitative traits.

GENETIC POLYMORPHISM OF MELATONIN RECEPTOR, CALPASTATIN AND CALPIN LUCI IN KARAKUL SHEEP

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Polymorphism in melatonin receptor 1a (*MTNR1A*) is associated with reproduction traits such as seasonal reproduction, fertility and litter size. The calpain-calpastatin system is found in most animal tissue and influences many important processes including muscle development and degradation, meat tenderization post-mortem, cataract formation. DNA was extracted from 100 pure-breed Karakul sheep from Karakul Breeding Station located at Sarakhs, Mashhad, Iran. PCR-RFLP method was used to genotyping *MTNR1A* and *CAST* loci and PCR-SSCP (single strand conformation polymorphism) was used for *CAPN* locus. Two genetic variants of ++ and +- for the *MTNR1A* locus with frequencies of 0.7 and 0.3, three genotypes of MM, MN and NN with frequencies of 0.60, 0.37 and 0.03 and two genotypes of AA and AB with frequencies of 0.85 and 0.15 were observed, respectively. The χ^2 test confirmed the Hardy-Weinberg equilibrium in this population. Observed variability could be regarded as a useful tool for selection programs, mainly marker assisted-selection.

Keywords: Karakul sheep, Calpastatin, Calpain, Melatonin receptor, Polymorphism