

Vol. 11 (4): 965-970 (2021)

BsmI AND HinfI POLYMORPHISMS OF THE FABP4 GENE OF DIFFERENT PIG BREEDS OF THE BELGOROD REGION IN RUSSIA

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Received August 2021; Accepted September 2021; Published October 2021;

DOI: <https://doi.org/10.31407/ijeess11.439>

ABSTRACT

PIGS were genotyped for FABP3 BsmI (G5005A) and HinfI (C406T) gene. The study examined 188 boars of four breeds (Duroc, Large White, Landrace and Yorkshire) from the Belgorod region of Russia. Fatty acid binding proteins (FABP) are involved in the regulation of metabolism, bind and transport fatty acids, and play an important role in the regulation of fat accumulation and distribution. Purpose of the study: to assess the frequencies of alleles and genotypes for BsmI and HinfI polymorphisms in FABP4 gene among the Duroc, Large White, Landrace and Yorkshire breeds at the farms of the Belgorod region of Russia. Materials and methods: Genomic DNA was isolated from alcoholized earmarks. Pigs were genotyped by PCR-RFLP method. The PCR product in the amount of 10 µl was hydrolyzed with 4 units of the corresponding restriction enzyme BsmI or HinfI (SibEnzyme, Russia) for 16 hours. The hydrolysis products were separated by horizontal electrophoresis in 2% agarose gel (Mini-Sub Cell GT, BioRad, USA). Gel blocks were stained with ethidium bromide (0.5 µg/ml) and visualized on a UV transilluminator to detect DNA fragments. Result: For C406T mutation, the presence of the T mutant allele was noted only for the Duroc breed (0.467), and the C allele was fixed for the other breeds. According to the G5005A mutation, the highest frequency of the A allele associated with the content of intramuscular fat increase was noted among Duroc pigs (0.440), and the smallest - in the Yorkshire breed (0.213). According to the χ^2 test, all studied breeds, except for monomorphic groups, are in the state of genetic equilibrium according to Hardy-Weinberg. Conclusion: Our data on the variability of these markers generally corresponds to previously published materials for the pigs of Chinese, Canadian and Korean selection. At the same time, the increase of the A BsmI allele frequencies is associated with a high content of IMF for the pigs of the Belgorod region, which may be associated with the result of breeding work to improve the meat quality.

Key words: pigs, FABP3 gene, BsmI (G5005A) and HinfI (C406T) polymorphisms.