

EFFECT OF SWINE GENOTYPE (PURE IBERIAN VS DUROC CROSSBRED) ON BÍCEPS FEMORIS MUSCLE TRANSCRIPTOME AT BIRTH

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Iberian ham is a high quality dry-cured pork product that may be obtained either from purebred Iberian (IB) or from crossbred Duroc X Iberian (DUxIB) pigs. There are significant differences, from early developmental stages, in productive traits and meat quality between both genotypes. This experiment was conducted to investigate gene expression patterns in IB and DUxIB pigs and to identify potential transcription factors (TF) regulating changes in gene expression. Nine IB and 10 DUxIB pigs were sampled at birth. Carcass traits were measured and samples from Biceps femoris were drawn to study intramuscular fat (IMF) content and composition and to analyze the muscle transcriptome with RNAseq technology. Carcasses were lighter and shorter in IB than in DUxIB neonates ($P < 0.001$); IB piglets showed greater IMF content and n6/n3 ratio ($P < 0.05$) and a trend to greater oleic acid and lower saturated fatty acids content ($P < 0.1$) than DUxIB. Regarding the muscle transcriptome analysis, 150 genes were found to be differentially expressed (DE) between IB and DUxIB ($P < 0.01$ and Fold change > 1.5); among them, 95 genes were upregulated in IB and 55 genes were upregulated in DUxIB. Some of them are closely related to lipid metabolism and muscular development biological functions (i.e. APOM, SLC2A4 or PVALV). Pathways analysis disclosed that upregulated genes in both groups were involved in "RXR/LXR activation", related to cholesterol homeostasis and lipogenesis. On the other hand, pathways such as "IGF-1 Signaling" or "Fatty Acid α -oxidation" were associated to genes upregulated in IB pigs; and "nNOS Signaling in Skeletal Muscle Cells" or "Actin Cytoskeleton Signaling" to genes upregulated in DUxIB pigs, suggesting a differential trend for adipose and muscle tissue growth in IB and DUxIB pigs. Afterwards, we investigated potential TF affecting gene expression in IB and DUxIB pigs. The 87 identified TFs are involved in pathways, such as "adipogenesis" or "Glucocorticoid Receptor Signaling". Among them, EGR2 and FOXO1 are of especial interest because of their roles in growth, adipogenesis and myogenesis. These results contribute a better understanding of mechanisms underlying productive and meat quality differences between purebred and crossbred Iberian pigs.