

## EFFECT OF SWINE GENOTYPE AND AGE ON LONGISSIMUS DORSI MUSCLE TRANSCRIPTOME

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Iberian pig production is based in both purebred Iberian (IB) and crossbred Duroc X Iberian (DUxIB) pigs. These two genetic types show important differences in growth, fattening and tissue composition. This study was conducted to assess muscular gene expression profiles in 16 IB and 20 DUxIB newborns and to understand how this profile may be affected by age. Nine IB and 10 DUxIB piglets were slaughtered at birth, and 7 IB and 10 DUxIB were slaughtered at 4 months-old. Carcass traits were measured and samples from Longissimus dorsi were taken 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 ( $P < 0.001$ ). At 4 months-old, IB pigs showed greater IMF content ( $P < 0.05$ ). Age significantly affected expression of 4662 genes in the muscle transcriptome analysis. However, the effect of the genetic type was smaller than time effect, since only 261 genes were found differentially expressed (DE) between IB and DUxIB ( $P < 0.01$  and Fold change  $> 1.5$ ) at birth; among them, 130 genes were upregulated in IB. At 4 months, 113 genes were DE, being 88 of them upregulated in IB. Ten genes were DE at both ages. Some of the DE genes were related to lipid metabolism and muscular growth biological functions (i.e. SLC2A4 or FOXO3 at birth and SNCA or HDL at 4 months). Pathways analysis at birth showed an enrichment in pathways related to energy homeostasis (Aldosterone Signaling) or protein metabolism (Ubiquitination Pathway), and to compound biosynthesis (serine, glycine and retinoids) or glucose metabolism (Glucose and Glucose-1-phosphate Degradation) at 4 months. Ingenuity Pathways Analysis software identified potential regulators related to the DE genes observed, such as FOXO3 and EGF at birth or CTNNA1 or NFKB1A at 4 months of age. The DE genes were also employed to build networks. At birth, main networks were related to the cardiovascular system and to Connective Tissue Disorders, with genes such as CDH2 or ELANE playing central roles. At 4 months, the most significant network built was related to Lipid Metabolism and showed interesting genes, such as SNCA or NPPC. Taken together, these results increase the knowledge about age-specific genes and molecular mechanisms underlying phenotypic differences observed between purebred and Duroc-crossbred Iberian pigs and highlight some candidate genes implicated in those molecular mechanisms.