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Late Fetal Blood Transcriptomic Approach To Get Insight Into Biology Related To Birth Survival

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In recent decades, improvement of prolificacy and body composition has been accompanied by a substantial increase in the mortality of piglets before weaning. The most critical period is the perinatal period, mostly during the first 24-48 hours following birth. The maturity of piglets, defined as the state of full development for survival at birth, is an important determinant of early mortality. The objective of our project is to take advantage of current knowledge about two pig breeds, Large White (LW) pigs selected for prolificacy and body composition and Meishan (MS) pigs being more robust. Maturity of several tissues and metabolite profiles of various fluids are analyzed on the fetuses (LW, MS and reciprocal F1) at day 90 or 110 of gestation (birth at day 114). Here we presented the transcriptomic analysis done on total blood samples (N=63). We did two different statistical analyses, a supervised one to reveal differential pathways for the interaction between gestational stages and genotypes and an unsupervised analysis (hclust and differential analyses) to identify potential predictors of a lesser maturity at birth. All p-values were adjusted with a Bonferroni correction < 1%.

The 265 genes differential for the interaction (Bonferroni 1%) in blood samples revealed many genes for mitochondrial ATP synthesis, transcriptional regulation, and response to hypoxia (overexpressed in LW at day 110 of gestation).

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Keyword: Pigs, Microarray, Blood, Fetal maturity