Breed effects on adipose tissue and muscle transcriptome in growing Iberian and Duroc pigs

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INTRODUCTION

Iberian pig production is based on both purebred Iberian and crossbred Duroc x Iberian pigs. Iberian and Duroc breeds show important phenotypic differences in growth, fattening, tissue composition, and meat quality. The study of breed effects on gene expression could explain phenotypic and metabolic differences between breeds.

AIM

The objective of this study was to evaluate breed effects on phenotype and ham subcutaneous adipose tissue and Biceps femoris muscle transcriptome in growing Iberian and Duroc pigs with RNAseq technology.

PHENOTYPIC RESULTS

Higher subcutaneous fat thickness in Iberian
24.1 vs 18.7 mm in loin P=0.001
27.8 vs 15.7 mm in ham P=0.001

Higher average feed intake in Iberian
2 vs 1.7 kg P=0.05

Higher % IMF in Biceps femoris in Iberian
3.7 vs 2.5 P=0.001

Higher ham weight in Duroc
4.5 vs 3.5 kg P=0.001

P<0.05 ** P<0.01 *** P<0.001

FUNCTIONAL ANALYSIS

CANONICAL PATHWAYS ADIPOSE TISSUE

CANONICAL PATHWAYS BICEPS FEMORIS

Activation in Iberian
P=1.80E-05

Inhibition in Iberian
P=3.96E-11

CONCLUSIONS

The results indicated a strong effect of the breed on gene expression in both tissues affecting relevant molecular functions related to the phenotypic differences observed. The bioinformatic analysis also allowed the prediction of potential regulators (such as ATF4, ERBB2, INS1 or TNF) for the expression differences observed.

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