Poster - O40
Construction of gene networks for growth traits and genetic profiling of Nelore beef cattle of Brazil

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Short Abstract: The Nelore is the major beef cattle breed in Brazil and Brazilian beef market is one of the largest of the world with more than 200 million heads. Growth and beef quality traits are of interest in animal breeding programs and markers associated to genes involved in these traits could be used to assist in selection programs. Genome-wide association studies (GWAS) are a common practice to associate markers and genome regions to growth and meat quality traits. The AWM/PCIT is an alternative methodology to simple GWAS, which involves the construction of gene network interactions, that integrates results from several GWAS, with the use of Association Weight Matrices (AWM) and Partial Correlation and Information Theory (PCIT). In this work we used high density genotyping data of 780 Nelore animals (34 half-sib families derived from the most commercially frequent and unrelated-prone sires from Brazil) to evaluate the genetic profile of Brazilian Nelore cattle. Results suggest lower variability than expected between the individuals studied. We also performed multiple GWAS with eight traits related to growth and meat quality and constructed a AWM/PCIT gene network set up with a growth key phenotype. We selected the most connected trio of transcription factors from this network and derived a sub-network that revealed to have several genes involved in growth and meat quality phenotypes. We expect this gene network to be useful in characterizing the genes and gene networks that are most influential in growth and meat quality traits in Nelore cattle.