

00-05 *NEDD4*: a putative candidate gene for ribeye area in Nellore steers

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Understanding muscle growth and development is one of the principal goals of animal science, given the role of these processes in beef yield and quality. The ribeye area (REA) is a carcass trait that has been used to predict the amount of lean meat in the animal and is important as a direct parameter of muscular development. This study aimed to identify differentially expressed genes (DEG), and metabolic pathways in Nellore steers with extreme genomic estimated breeding values (GEBV) for REA. For that, the GEBV of 385 animals were obtained by the GenSel program. After that, twelve animals with extreme GEBV values were selected, and divided into two groups of six animals each, High and Low. The total RNA was extracted from the *Longissimus dorsi* muscle of these selected animals. Next generation sequencing technology (HiSeq2500 from Illumina platform) was used, and the quality of raw reads was analyzed using the FastQC software. The alignment and counting were performed using TopHat2 and HTSeq software, respectively. The differential expression analysis was carried out by DESeq2 software from R. It was identified 101 DEG (FDR<0.1), 72 down-regulated and 29 up-regulated in the Low REA group. Among the down-regulated genes, *NEDD4* (neural precursor cell expressed, developmentally down-regulated 4, E3 ubiquitin protein ligase), enriched in the endocytosis pathway by DAVID v6.7 (nominal p-value<0.1), encodes a ubiquitin protein ligase belonging to the Nedd4 family. This gene is required for cell surface expression of the IGF-1 (insulin-like growth factor, type 1) receptor and insulin receptor, and is a positive regulator of IGF-1 and insulin signaling. The IGFs are responsible for fetal and postnatal growth and are strongly related to muscle differentiation. Studies with knockout mice for the *NEDD4* gene showed that loss of *NEDD4* reduced IGF-1 and insulin signaling, delayed embryonic development, and reduced growth and body weight. These results indicate that *NEDD4* can be a putative candidate gene for REA in Nellore cattle, but more research is needed to better understand its complete role in muscular growth.

Keywords: Bovine, differential expression analysis, muscle growth, RNA-Seq.