

## **Impact of Nutrition on Mammary Transcriptome and its Interaction with the CSN1S1 Genotype in Lactating Goats**

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Genetic and nutritional factors significantly affect milk composition, influencing its nutritional quality. Milk lipid synthesis and secretion by the mammary gland require the expression of a large number of genes whose regulation remains poorly defined. To investigate pathways regulated by nutrition and its interaction with genetic factors, we performed a comparative analysis of mammary transcriptomes from 12 lactating goats of different  $\alpha_{s1}$ -casein (CSN1S1) genotype ("High" vs. "Low"), under extreme nutritional conditions (standard diet vs. 48-h fasting). A bovine oligochip containing 8,400 different gene probes was used for expression profiling. Then, to complete the analysis, mRNA quantitation of transcripts involved in milk fat synthesis and secretion was done by RT-qPCR. Something like 200 differentially expressed genes between the two nutritional conditions were identified, 84% of which were downregulated by fasting. Feed deprivation altered several metabolic pathways in mammary gland. In particular, the decrease in mRNA abundance of genes encoding major milk proteins and lipogenic enzymes was in agreement with milk protein and fat secretion decreases. Moreover, among these 200 differentially expressed genes, 69 were common between two genotypes whereas the fasting effect on expression of 9 genes was different according to the genotype. This experiment shows an interaction between nutritional and genetic factors, which is currently under investigation.

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