

**Feeding level regulates the expression of some genes involved with programmed cell death and remodeling in goats and sheep mammary tissue**

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***Running head:*** *Feeding level affects mammary tissue turnover*

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**Abstract**

The mammary tissue (MT) is characterized by programmed cell death and remodeling which might be affected by both feeding level and animal's species. Thus, twenty-four dairy goats and sheep respectively were assigned to three homogenous sub-groups per animal species and fed the same diet in quantities which met 70% (underfeeding), 100% (control) and 130% (overfeeding) of their energy and crude protein daily requirements. Individually MT samples were taken by biopsy from the animals on the 30<sup>th</sup> and 60<sup>th</sup> experimental day. The results showed a significant reduction in the mRNA accumulation for selected genes involved in the MT programmed cell death in both goats (*STAT3* and *BECNI*) and sheep (*CASPASE8* and *BECNI*) fed with the low feeding level compared with the respective controls. The high feeding level, in comparison with the control, caused a significant increase in the transcripts' accumulation of *STAT3* and *CASPASE8* genes in goats MT, while the opposite happened for the mRNA expression of *CASPASE8* and *BECNI* genes in sheep. Moreover, a significant up regulation in the mRNA levels of *MMP2* gene in sheep MT fed with the high feeding level, compared with the control ones, was observed. The overfeeding, in comparison with the underfeeding, caused an enhancement in the mRNA expression levels of *STAT3*, *CASPASE8* and *BECNI* genes in goats MT only. It was also shown that apoptosis and autophagy can be affected simultaneously by the feeding level. The high feeding level affects MT programmed cells death and remodeling by a completely different way in goats than sheep. In conclusion, both feeding level and animal's species have strong effects on both MT programmed cells death (apoptosis and autophagy) and remodeling but the molecular mechanisms need further investigation.