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Can lipid supplementation modulate inflammatory state and immune response in periparturient goats? A case study on hepatic and adipose miRNA expression

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Abstract

As a new perspective in controlling cellular pathways, the aim of the trial was to investigate the expression of miRNA implicated in adipogenesis and metabolic and endocrine functions in periparturient dairy goat fed saturated or unsaturated fatty acids. Hepatic and adipose tissue samples were obtained from twenty-three second-parity twins-diagnosed alpine dairy goats were fed either calcium stearate (ST, n:7), fish oil (FO, n:8) or a control diet without any fat supplement (C, n:8). Dietary treatments lasted from one week before (30g/head/d of fatty acids) to three weeks after kidding (50g/head/d of fatty acids). ST provided 26% C16:0 and 69.4% C18:0 while FO provided 10.4% EPA and 7.8% DHA. The expression of miR-26b and 155 (adipose infiltration of immune cells), miR-99a, 145 and 221 (inflammation and lipolysis) and miR-143 and 378 (pro-adipogenic function) was performed by RT-PCR on hepatic and adipose biopsies collected on day -7 and 7 and 21 from kidding. Data were statistically analyzed by MIXED and GLM procedures of SAS. No diet effect was found for all the miRNA considered, but a significant effect of time for miR-155 (P= 0.028) and a tendency for miR-221 (P=0.083) were found with increased values from -7 to +21d. In particular, significant higher miR-155 expression (P<0.01) from -7 to 7d (-0.17 and 0.27, respectively) proved an inflammatory status in the first week after kidding in all the groups. Obtained results for both miRNA-155 and miRNA-221 over the time copes with our previous findings on metabolic, productive parameters and mRNA expression of genes related to lipid metabolism and inflammatory response (Farina *et al.*, 2016). These outcomes consolidate the hypothesis that lipogenesis takes place in dairy goat in the two weeks around calving, but it is reduced when compared to dairy cow (Khan *et al.*, 2013).

References

- Farina, G., Agazzi, A., Invernizzi, G., Campagnoli, A., Loo, J.J., and Savoini, G., 2016. Transcriptional regulation of lipid metabolism and inflammation in transition dairy goats by fish oil and stearate. *International Journal of Health, Animal Science and Food Safety*. 3 (15)
- Khan, M. J., Hosseini, A., Burrell, S., Rocco, S.M., McNamara, J.P., and Loo, J.J. 2013. Change in subcutaneous adipose tissue metabolism and gene network expression during the transition period in dairy cows, including differences due to sire genetic merit. *Journal of Dairy Science*. 96, 2171–2182