

An integrative approach of lipid metabolism in dairy cows and goats : are the differences of nutritional regulation from mammary or ruminal origin?

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A direct comparative nutritional study with 4 hay-based diets (not supplemented or supplemented with corn oil and starch, marine algae, or 16:0+18:0) was carried out on dairy goats (n=12) and cows (n=12) from January to July 2016. Measures of milk yield and composition, milk and plasma fatty acid composition, quantitative digestive processes (energy loss as methane emission and digestibility), feeding behavior recording together with measures related to rumen (microbiota and fermentation parameters, fluid fatty acid composition) and mammary gland (mRNA and protein abundances of genes) lipid metabolism were performed. The aim of this study is to clarify and order the mechanisms explaining the difference of response of these 2 ruminant species to specific nutritional conditions, by focusing on the study of :

1. The differences in fatty acid profiles, in particular trans-FA, CLA and delta-9 desaturase ratios, in milk, plasma and ruminal fluid.
2. The effects of trans-FA on mammary metabolism and the underlying mechanisms
3. The microbiota, and particularly bacteria and protozoa species, involved in the ruminal biohydrogenation pathways of FA and its relation with feeding behavior of animals.
4. The effects of addition of lipid supplements on the quantitative digestive balance: do animal species have different dietary efficiency?

The major issue of this project is to develop livestock strategies to improve the quality of milk and the performances of dairy ruminant.