# Relationships between rumen protozoa, biohydrogenation and bioactive fatty acids deposition on lamb muscle


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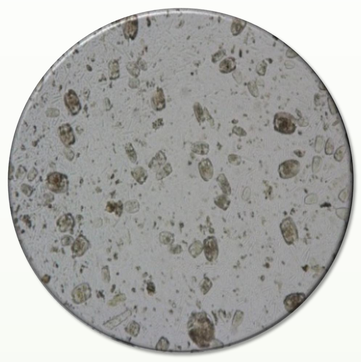
## OBJECTIVES

**Investigate the occurence of associations between the abundance of ruminal protozoa and the proportion of *t*10-18:1, *t*11-18:1, *c*9,*t*11-18:2 and polyunsaturated fatty acids (PUFA) in rumen content and in lamb muscle.**

## CONCLUSIONS

**- The results suggest a link between rumen fauna and meat nutritional quality, which intensity may depends of the ciliates community struture.**

**- Rumen protozoa density is positively related with the deposition of bioactive fatty acids benefits to human health and negatively related to the occurence of *trans*-10 shift.**



## BACKGROUND

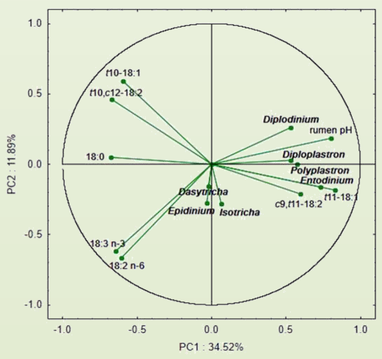
**The protozoa may correspond to half of the ruminal biomass and their membranes are high in PUFA and in biohydrogenation intermediates (BH), with healthy properties, such as t11-18: 1 and c9, t11-18: 2.**

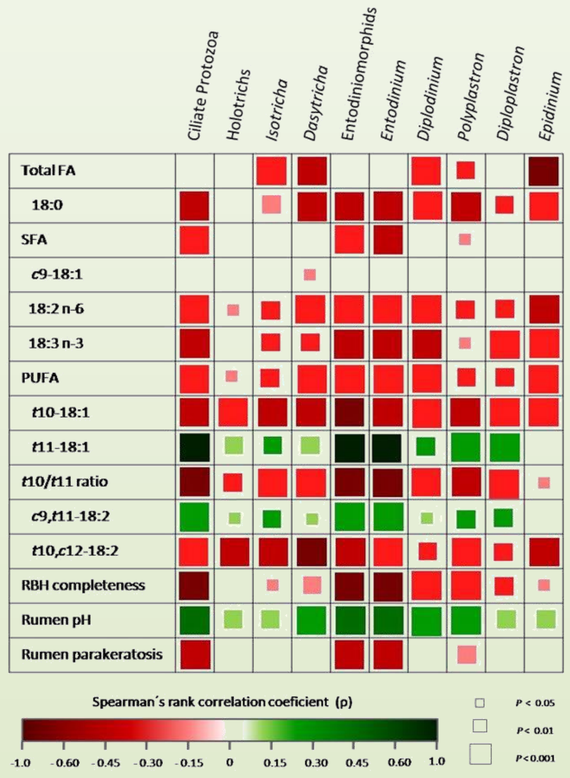
**Rumen protozoa can act as reservoirs of these fatty acids in the rumen, which can flow-out and deposit into animal tissues.**

**Ciliate protozoa can also stabilize ruminal pH by regulating starch fermentation, which may help to control changes in the normal BH pattern and reduce the risk of occurrence of *trans*-10 shift.**

## RESULTS

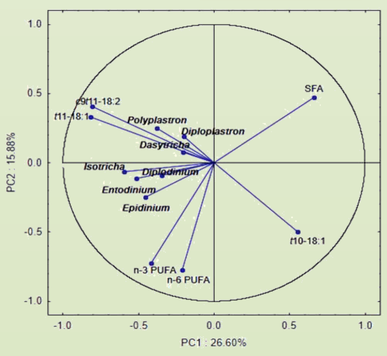
### Rumen

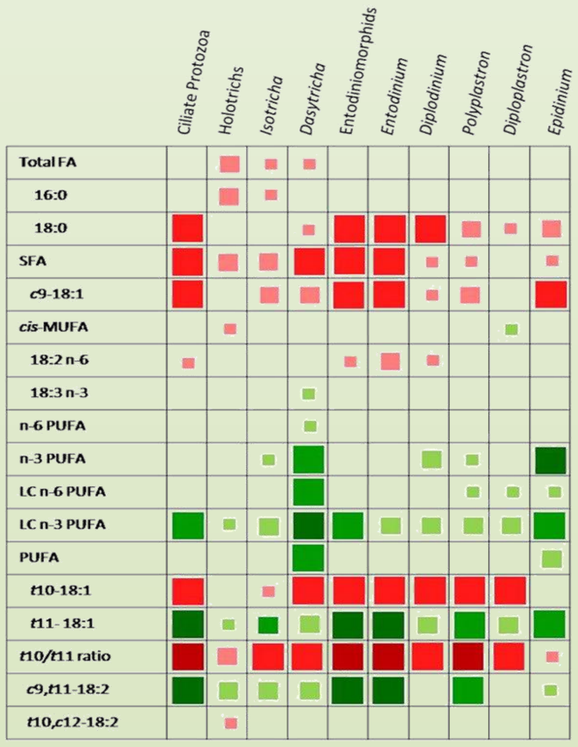


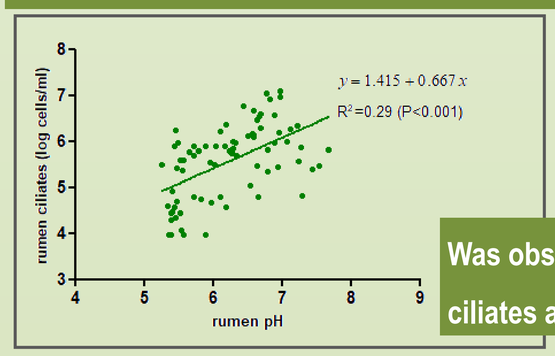

**Ciliate protozoa were, in general, positively correlated with, *t*11-18:1 and *c*9,*t*11-18:2 and negatively correlated with *t*10-18:1 and *t*10/*t*11-18:1 ratio in both rumen and muscle.**

### Muscle



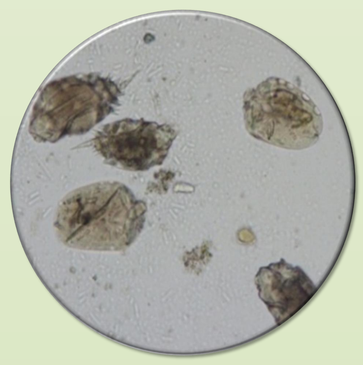




**The highest correlations between *t*10-18:1, *t*11-18:1, *c*9,*t*11-18:2 and *t*10/*t*11-18:1 ratio were found for *genus Entodinium*,**

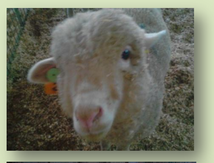



**Was observed a positive relationship between total rumen ciliates and rumen pH.**





## MATERIAL AND METHODS



Data were obtained from 4 independent production trials with Merino Branco lambs (N=116) performed, in EZN-INIAV, to evaluate different nutritional strategies to enhance the content in *t*11-18:1, *c*9,*t*11-18:2and PUFA in the meat from lambs reared with complete diets.

Whole rumen content was collected at slaughter. Samples of rumen liquor were preserved with formalin solution and refrigerated.

Rumen protozoa densities were assessed by microscopic counting and ciliates were identified at genus level.

Rumen and *longissimus* muscle fatty acids were determined with gas chromatography.

Global principal component analyses and Spearman correlation coefficient were applied.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