Identification of Δ^{13}-desaturation products in sheep milk using GC-C-IRMS

Pablo G. Toral*, Pilar Frutos and Gonzalo Hervás

Instituto de Ganadería de Montaña (IGM) CSIC-University of León, León, Spain
*E-mail: pablo.toral@csic.es

INTRODUCTION

GC-C-IRMS offers **high sensitivity and accuracy**, being particularly suitable to quantify low-abundant fatty acids.

Δ^{13}-desaturase has been shown to catalyze the synthesis of *trans*-11 *cis*-13 CLA in goats.

However, we are <u>not</u> aware of any similar research in other ruminant species or identifying other products of the enzyme.

AIM: To identify **Δ^{13}-desaturation products in sheep** milk.

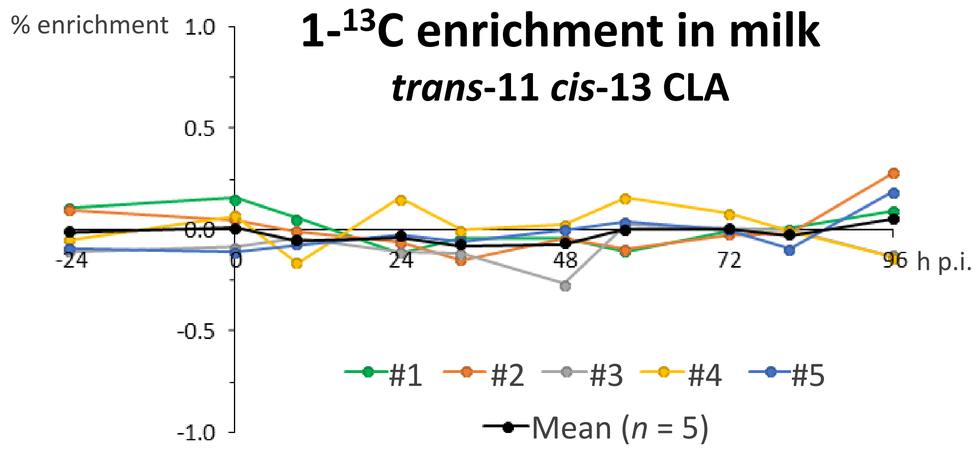
MATERIAL AND METHODS

	TRIAL 1	**TRIAL 2**
Assaf dairy ewes	*n* = 5	*n* = 6
[1-^{13}C] isotopic tracer delivered by continous jugular infusion for 30 min	*trans*-11 18:1 200 mg	18:0 2,000 mg
Milk sample collection Hours post-injection (p.i.)	From -24 to 96 h 11 time points	From -24 to 72 h 14 time points

Milk FA profile was determined by GC-FID and **^{13}C enrichment** by **<u>GC-C-IRMS</u>** (gas chromatography-combustion-isotope ratio mas spectrometry)

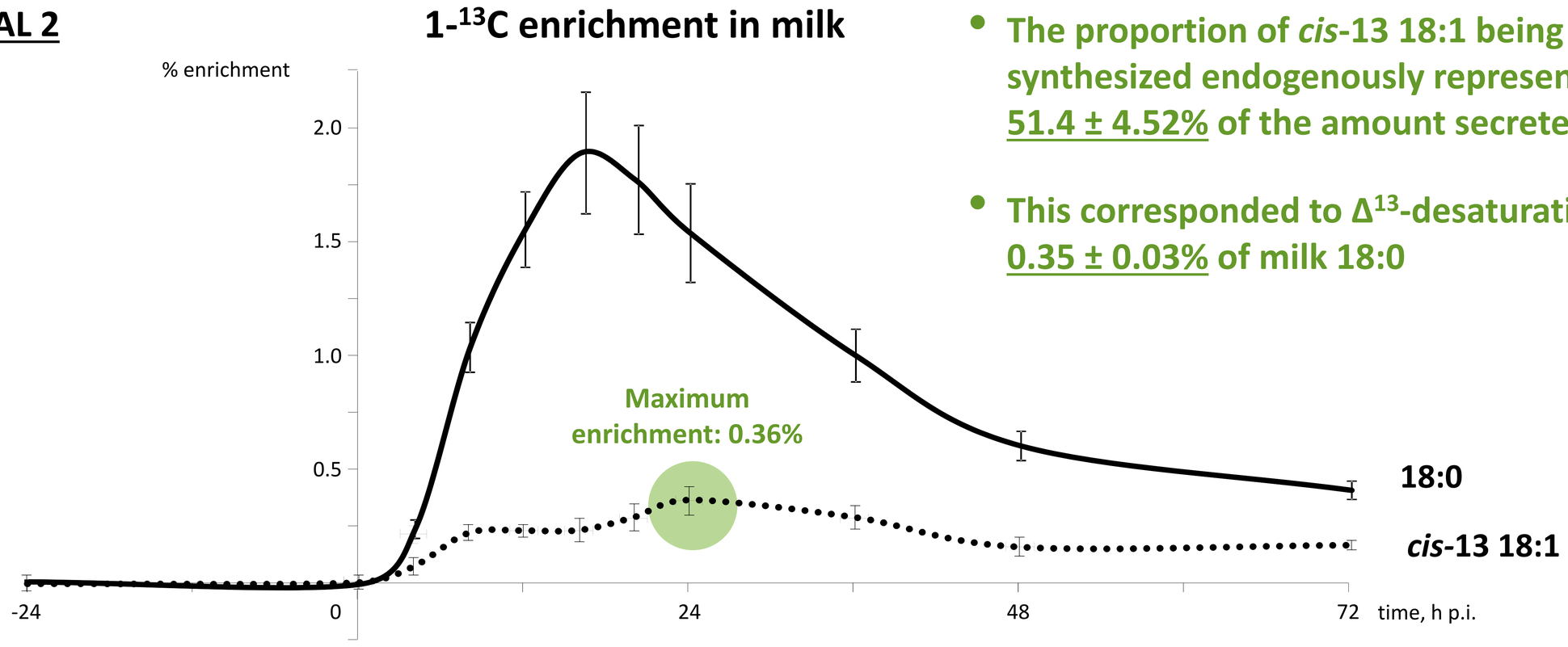
RESULTS

TRIAL 1



Despite the high accuracy and precision of GC-C-IRMS, we detected **<u>no significant increase</u>** in ^{13}C enrichment above basal levels

TRIAL 2



- **The proportion of *cis*-13 18:1 being synthesized endogenously represented <u>51.4 ± 4.52%</u> of the amount secreted in milk**
- **This corresponded to Δ^{13}-desaturation of <u>0.35 ± 0.03%</u> of milk 18:0**

CONCLUSION

Results reveal, for the first time, Δ^{13}-desaturation of 18:0 and this enzyme activity in sheep, but it is not possible to conclude whether the lack of *trans*-11 18:1 desaturation was due to a specificity in this ruminant species, to the dose of the isotopic tracer, or to the very low content of *trans*-11 *cis*-13 CLA in milk (0.007% of total fatty acids). Further research is advisable.

Acknowledgements: PIE202240I195 (CSIC)

Euro Fed Lipid congress and expo – September 17-20, 2023 – Poznan, Poland