CONJUGATED LINOLEIC ACID EFFECTS ON PREADIPOCYTE SHEEP DIFFERENTIATION

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INTRODUCTION AND OBJETIVES

- **Conjugated linoleic acids (CLA's) are of interest regarded their potential to alter lipid metabolism and to reduce body fat mass. Trans10, cis12 isomer has been shown to inhibit 3T3-L1 cells differentiation, thus a proposed mechanism of action for CLA's is to decrease adipocyte differentiation.**

- **The main objetive of this work was to analyse the effect of isomers trans10, cis12 and cis9, trans11 on the differentiation of sheep preadipocytes of different anatomical origin *in vitro*.**

METHODS

- **preadipocyte isolation from adipose tissue and *in vitro* differentiation**
  - **differentiation inducers: 1.6 mg/ml insulin (I), 2 nM triiodotyronine (T), 10 nM dexamethasone (D), 0.1 μM rosiglitazone (R), 25 or 50 μM trans-10, cis-12 CLA (CLA10-12), 25 or 50 μM cis-9, trans-11 CLA (CLA9-11).**
- **assesment of number of differentated cells.**
  - **flow cytometry and Red O oil staining**
- **statistics**
  - **analysis of variance (SPSS program).**

RESULTS

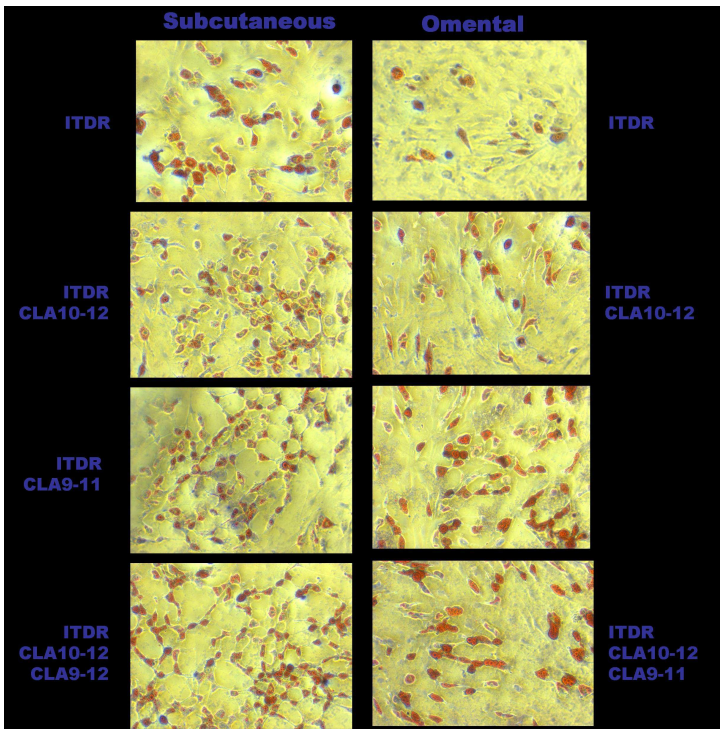

Figure 1.- Microphotographs (x100) of subcutaneous and omental preadipocytes stained with Red Oil O cultured for 10 days and treated with ITDR and conjugated linoleic acids supplemented treatments (CLA concentration was 50μM for the one isomer treatments or 25 μM each for the two isomers treatment).

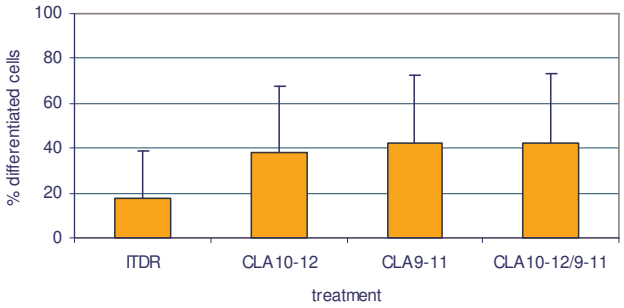

Figure 2.- Percentage of differentiated preadipocytes as quantified by flow cytometry with ITDR and CLA supplemented treatments. Data represent means ± SD for 3 lambs, (P>0.05).

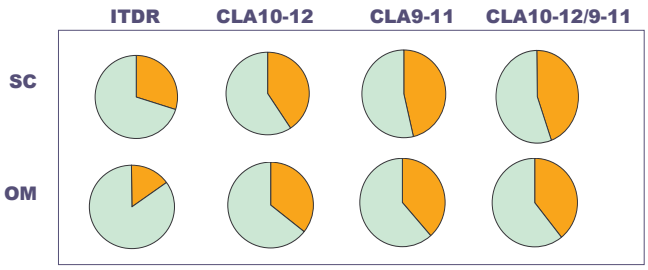

Figure 3.- Percentage of subcutaneous and omental differentiated preadipocytes as quantified by flow cytometry (orange) with ITDR and CLA treatments. Data represent means for 3 lambs.

DISCUSSION AND CONCLUSIONS

- **Addition of CLA's did not change the number of differentiated cells, although there was a tendency for a higher number of differentiated cells. This differs with the results obtained with cell lines but is in accordance with results in pig primary preadipocytes, suggesting species and/or experimental model specific differences.**

- **There were no differences between subcutaneus and omental preadipocytes treated with CLA's, similarly to results found when cells were challenged with other fatty acids but opposite to results found with other differentiation inducers.**

- **These results suggest that CLA's stimulate lipid filling of sheep preadipocytes, irrespective of the isomer, and contribute to omental cells losing their "resistance" to *in vitro* differentiation.**