

Serum adipokine profile and fatty acid composition of adipose tissues are affected by conjugated linoleic acid and saturated fat diets in obese Zucker rats

Susana V. Martins^{1*}, Paula A. Lopes¹, Cristina M. Alfaia¹, Pedro O. Rodrigues², Susana P. Alves^{3,4}, Rui M. A. Pinto⁵, Matilde F. Castro⁵, Rui J. B. Bessa^{1,3} and José A. M. Prates¹

¹Secção de Bioquímica, CIISA, Faculdade de Medicina Veterinária, Universidade Técnica de Lisboa, Avenida da Universidade Técnica, 1300-477 Lisboa, Portugal

²Departamento de Bioquímica, Faculdade de Ciências Médicas, Universidade Nova de Lisboa, Campo dos Mártires da Pátria 130, 1169-056 Lisboa, Portugal

³Unidade de Produção Animal, L-INIA, INRB IP, Fonte Boa, 2005-048 Vale de Santarém, Portugal

⁴REQUIMTE, ICBAS, Universidade do Porto, Rua Padre Armando Quintas, 4485-661 Vairão VC, Portugal

⁵iMed UL, Faculdade de Farmácia, Universidade de Lisboa, Avenida Professor Gama Pinto, 1649-003 Lisboa, Portugal

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Conjugated linoleic acid (CLA) has been reported as having body fat lowering properties and the ability to modulate the inflammatory system in several models. In the present study, the effects of CLA added to saturated fat diets, from vegetable and animal origins, on the serum adipokine profile of obese Zucker rats were assessed. In addition, the fatty acid composition of epididymal and retroperitoneal adipose tissues was determined and a principal component analysis (PCA) was used to assess possible relationships between fatty acids and serum metabolites. Atherogenic diets (2% cholesterol) were formulated with palm oil and ovine fat and supplemented or not with 1% of a mixture (1:1) of *cis*-9,*trans*-11 and *trans*-10,*cis*-12-CLA isomers. CLA-fed animals exhibited lower daily feed intake, final body and liver weights, and hepatic lipids content. Total and LDL-cholesterol levels were increased in CLA-supplemented groups. CLA also promoted higher adiponectin and lower plasminogen activator inhibitor-1 (PAI-1) serum concentrations. In contrast to palm oil diets, ovine fat increased insulin resistance and serum levels of leptin, TNF- α and IL-1 β . Epididymal and retroperitoneal adipose tissues had similar deposition of individual fatty acids. The PCA analysis showed that the *trans*-10,*cis*-12-CLA isomer was highly associated with adiponectin and PAI-1 levels. Summing up, CLA added to vegetable saturated enriched diets, relative to those from animal origin, seems to improve the serum profile of adipokines and inflammatory markers in obese Zucker rats due to a more favourable fatty acid composition.

Conjugated linoleic acid: Saturated diets: Adipokines: Fatty acids: Obese Zucker rats

Abbreviations: AST, aspartate aminotransferase; CLA, conjugated linoleic acid; *c*9,*t*11-CLA, *cis*-9,*trans*-11-CLA; *t*10,*c*12-CLA, *trans*-10, *cis*-12-CLA; CRP, C-reactive protein; HOMA-IR, homeostasis model assessment-insulin resistance; OCLA, ovine fat diet + 1% of CLA; PAI-1, plasminogen activator inhibitor-1; PC, principal components; PCLA, palm oil diet + 1% of CLA.

* **Corresponding author:** Susana V. Martins, fax +351 21 3652829, email smartins@fmv.utl.pt