

Olive oil addition to the high-fat diet reduces methylglyoxal (MG-H1) levels increased in hypercholesterolemic rabbits

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Authors: [Simón, Layla^{a, 1, *}](#) | [Saez Lancellotti, Tania E.^{a, 1}](#) | [Cortese, Leandro^a](#) | [Veisaga, Maria-Luisa^b](#) | [Chantarasinlapin, Preaw^c](#) | [Barbieri, Alejandro^b](#) | [Fornés, Miguel^a](#)

Affiliations: [a] Laboratory of Andrologic Research of Mendoza, Institute of Histology and Embryology, Faculty of Medicine, National University of Cuyo, and Technologic Scientific Center (CCT), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Mendoza, Argentina | [b] Department of Biological Sciences, Florida International University, Miami, FL, USA; Biomolecular Sciences Institute, Florida International University, Miami, FL, USA; Fairchild Tropical Botanic Garden, Coral Gables, FL, USA; International Center of Tropical Botany, Florida International University, Miami, FL, USA | [c] Department of Dietetics and Nutrition, Robert Stempel College of Public Health and Social Work, Florida International University, Miami, FL, USA

Correspondence: [*] Corresponding author: Layla Simón, Laboratory of Andrologic Research of Mendoza, Institute of Histology and Embryology, Faculty of Medicine, National University of Cuyo, and Technologic Scientific Center (CCT), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), 5500, Mendoza, Argentina. E-mail: lsimonujam@gmail.com.

Note: [1] Equal contributors.

Abstract: BACKGROUND: Methylglyoxal (MG) is a highly reactive compound derived from sugar metabolism, precursor of cytotoxic products named Advanced Glycation End products (AGEs). Increased MG levels and MG-related AGEs have been long associated with diabetes and its complications. The association between MG and hypercholesterolemia – induced by high-fat diets- has not been studied previously, neither the effect of olive oil addition to this diets. OBJECTIVE: To analyze the variations of MG and cholesterol levels under the effect of high-fat and olive oil-enriched diets. METHODS: Sixteen healthy male adult (New Zealand White, 6 months old) rabbits were fed with commercial pellets (control, four rabbits), or with 14% of bovine grease added to the pellets (high-fat diet, twelve rabbits). After six months, bovine grease was reduced to 7% (half fat diet, eight rabbits). Then, 7% of olive oil was added to the pellets (protective diet, four rabbits). Glycaemia, cholesterolemia, HDL-cholesterolemia, triglyceridemia, fructosamine and MG-H1 levels were assessed in all experimental conditions (n=4). RESULTS: The high-fat diet promoted a hypercholesterolemia associated with increased MG-H1 levels ($p < 0.05$) in non-diabetic and non-obese rabbits. Replacement of the high-fat diet with olive oil decreased significantly the cholesterolemia and MG-H1 levels ($p < 0.05$). CONCLUSIONS: Our data indicates that the replacement of a high-fat diet with olive oil can recover normal blood cholesterol values and can decrease MG-H1 levels.

Keywords: Methylglyoxal, hypercholesterolemia, olive oil, high-fat diet

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