

Effect of dietary oils on oxidative stress and cytokine production by murine macrophages

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Many studies have shown that the nature of the lipid consumed in the diet significantly affects the prevalence of coronary, inflammatory or autoimmune diseases^(1,2). The present study was conducted to compare the impact of feeding mice on diets enriched with edible oils (150 g/kg diet; fish oil (FO), olive oil (OVO) and orujo olive oil (ORO)) with that of a basal diet (BD) enriched with 20 g maize oil/kg on the ability to modulate oxidative reactive species and pro-inflammatory mediator generation by stimulated murine macrophages. Swiss male mice were fed on the different diets for 8 weeks. Diets were formulated according to American Institute of Nutrition (AIN) recommendations⁽³⁾. Peritoneal macrophages were isolated from these mice and stimulated. Reactive oxygen (O_2^- and H_2O_2) and nitrogen (NO_2^-) species, PGE_2 , $TNF\alpha$ and IL-6 were measured in the supernatant fractions from 10^6 cells. All test diets down regulated NO generation compared with the BD (Fig.1); in contrast, FO increased H_2O_2 generation whereas OVO and ORO group diets significantly inhibited this ROS production compared with the BD. In addition, ORO was able to decrease O_2^- formation compared with the BD group (Fig.1). Finally, both OVO and FO groups significantly decreased PGE_2 and cytokine production (Fig. 2). These results are in agreement with those of other authors in that a diet enriched in olive oil was found to show a protective effect against oxidative stress and inflammation^(4,5) and they confirm the preventive anti-inflammatory properties of FO⁽⁶⁾. Moreover, the results provide important additional data about the ability of ORO to prevent oxidative damage to cells.

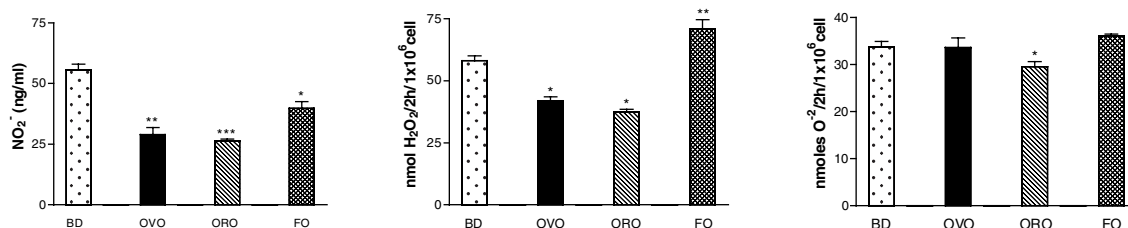


Fig. 1. Reactive oxygen and nitrogen species generated by stimulated murine peritoneal macrophages isolated from mice fed on different oil-enriched diets. Values are means with their standard errors represented by vertical bars for five animals fed on each diet. Mean values were significantly different from those for BD (ANOVA and Student's *t* test): **P*<0.05, ***P*<0.01, ****P*<0.001.

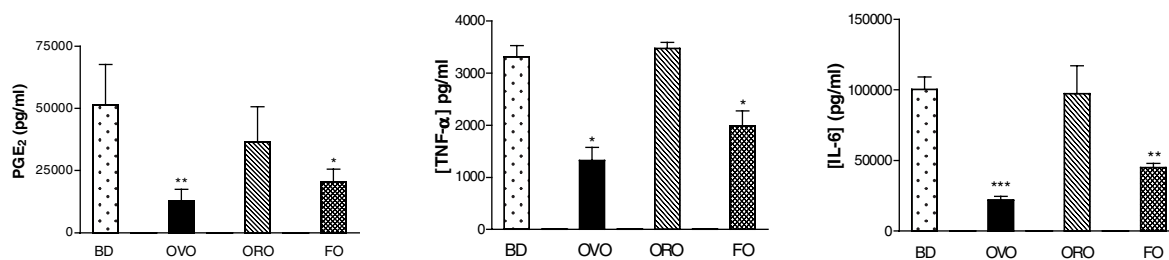


Fig. 2. PGE_2 and cytokines generated by lipopolysaccharide-stimulated murine peritoneal macrophages isolated from mice fed on different oil-enriched diets. Values are means with their standard errors represented by vertical bars for five animals fed on each diet. Mean values were significantly different from those for BD (ANOVA and Student's *t* test): **P*<0.05, ***P*<0.01, ****P*<0.001.

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