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Diet enriched with *cis9,trans11* CLA isomer regulates spleen proliferative immune response in rats

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Conjugated linoleic acid (CLA) seems to induce health effects in humans, but it has been suggested that it is the *cis9,trans11* (*c9,t11*) CLA isomer that may be responsible for modulating the immune response⁽¹⁾. The present study evaluates the effect of supplementing rats with an 80:20 mix of *c9,t11* and *t10,c12* CLA, respectively, on the capacity of generating polyclonal and antigen-specific immune responses.

A group of rats received CLA ($n = 20$) during gestation and suckling through dams fed 1% CLA enriched diet and directly after weaning were fed same CLA dams diet until the adult age (15 weeks). Rats fed standard diet AIN-93G ($n = 20$) were used as reference group. At 9-week-old of age all animals were immunized with ovalbumin (OVA) and 6 weeks later, spleens were removed and splenocytes were isolated and cultured. Cell proliferation was assayed by addition of polyclonal stimulus (PMA/Io, 250 ng/ml) for 72 h and determined by an ELISA method based on 5'-bromo-2'-deoxyuridine cell incorporation. Supernatant IL-2 concentration after 24 h in same activation conditions were also quantified by ELISA. Specific proliferative response was evaluated by stimulating culture cells with OVA (10 µg/ml) for 96 h. Anti-OVA Ig production was determined in spleen culture supernatants and sera by ELISA, whereas spleen anti-OVA IgA-, IgG- and IgM-secreting cells (SC) were quantified by ELISPOT. Conventional ANOVA and *post hoc* comparisons were performed.

Splenocytes from animals which received CLA diet during all their life presented a lower (~10%) proliferative response after PMA/Io stimulation ($P < 0.05$), which was also correlated to IL-2 cytokine reduction. The down-regulatory effect was not due to spleen cell viability loss. However, splenocytes from animals fed CLA diet presented a significant increase (~110%) in proliferative response after antigen (OVA)-stimulation compared to that of reference animals ($P < 0.05$). OVA-immunized rats showed higher number of spleen anti-OVA IgG- and IgM-SC than IgA-SC. This pattern was not affected by long-term dietary CLA, although a tendency to increase the number of anti-OVA IgA-SC was exhibited. No differences were observed for anti-OVA Ig production between both dietary groups.

These results demonstrate that, although long-term supplementation with *c9,t11* CLA seems not to affect humoral response, it is able to down-regulate unspecific lymphocyte proliferative function and to enhance specific proliferation by immunocompetent cells.

1. Ramírez-Santana C, Castellote C, Castell M *et al.* (2009) *J Nutr* **139**, 76–81.