

ICCN Poster Presentations

Food, inflammation and the anti-inflammatory aspects of food

Palm oil tocotrienol mixture is better than alpha-tocopherol acetate in protecting bones against free-radical induced elevation of bone-resorbing cytokines

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Ferric Nitrilotriacetate (FeNTA) generates oxygen derived free radicals, which can activate bone resorption by osteoclasts. We studied the effects of several doses of vitamin E supplementation on FeNTA induced changes in bone resorption activity and in the levels of the bone resorbing cytokines, Interleukin -1 (IL-1) and Interleukin - 6 (IL-6). 4-week old male rats were treated with intraperitoneal FeNTA 2mg/kg, and the respective dose of oral vitamin E for 3 weeks. Two forms of vitamin E, palm oil tocotrienol mixture (PVE) and pure α -tocopherol acetate (ATF) were used to compare their efficacy. Only the PVE at doses of 60 and 100 mg/kg were able to prevent FeNTA induced elevation of IL-1. Both the PVE and ATF at doses of 30, 60 and 100 mg/kg were able to reduce FeNTA induced elevation of IL-6. Bone resorption activity, as measured by urine deoxypyridinolin (DPD) levels were significantly decreased by all doses of the PVE. However for the ATF groups, reduction the DPD levels were seen only in the groups given the higher doses, i.e. 60 and 100 mg/kg rat weight. A relative increase in bone formation compared to bone resorption was seen for all the groups given the PVE. However for the group given ATF, only the higher doses of 60 and 100 mg/kg rat weight showed significant relative increase in bone formation compared to bone resorption. In conclusion; the results showed that PVE was better than ATF in protecting bone against free radicals induced elevation of bone-resorbing cytokines. PVE was also shown to be more potent than ATF in reducing bone resorption activity. Therefore the palm oil tocotrienol mixture was more potent than pure α -tocopherol acetate in protecting the bones of rats exposed to ferric nitrilotriacetate toxicity.

Soy protein isolate and isoflavones modulate serum immunoglobulin levels in rats

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The antigenicity of soy protein and soy-derived isoflavones (ISF) as well as their effect on the development of immunologic mechanisms in soy formula-fed infants has not been well understood. The purpose of this study was to use rats as a model to examine the effect of alcohol-washed soy protein isolate (SPI) and supplemental ISF from Novasoy (a concentrate) on serum immunoglobulin (Ig) contents. Pubertal Sprague-Dawley rats were fed diets containing either 20% casein or 20% SPI \pm ISF (250 mg/kg diet). At 120 days of age, the males and females from the same dietary group were mated to produce F1 pups. The F1 pups were fed the same diets as their parents, and killed at days 28, 70, 120, and 240. Serum IgA, IgE, IgG, and IgM levels in females were measured using ELISA. The rats fed the diet containing SPI alone had significantly higher IgA and IgM contents at day 28 and lower IgG level at day 240 than those fed the casein-based diet ($p < 0.05$). Addition of ISF to the SPI-based diet further enhanced the serum IgA and IgM in day 28 rats ($p < 0.01$), and markedly elevated IgG content in day 28, 70 and 120 rats compared with casein and SPI alone. However, neither SPI nor ISF had any effect on IgE, one of the allergy mediators. Overall, these results demonstrate that ISF is more antigenic than soy protein in young female rats, but both are not allergenic. (*Supported by Health Canada*)