

NSA

Food, Pro and Prebiotics: Effects Beyond the Gut

Food inflammation and the anti-inflammatory aspects of food

LG Cleland, MJ James, SM Proudman

Rheumatology Unit, Royal Adelaide Hospital, Adelaide SA 5000

Food can have pro-inflammatory and anti-inflammatory effects. Pro-inflammatory effects can result from irritants and immunoreactive substances. These factors tend to have their effects, within the gut, which can be avoided by specific dietary exclusion. With regard to anti-inflammatory effects of diet away from the gut, altering the balance of dietary polyunsaturated fatty acids (PUFA) in favour of *n*-3 PUFA provides the best documented examples of effective dietary intervention. PUFA are essential macronutrients. There are two non-interchangeable classes of dietary PUFA, *n*-6 and *n*-3. These fatty acids are metabolized to mediators that regulate cardiovascular homeostasis and inflammation. *n*-6 rich diets tend to be pro-inflammatory. Diets rich in *n*-3 PUFA, by comparison, are anti-inflammatory. The difference is explained by the action of *n*-3 PUFA as competitive inhibitors of enzymes that metabolize *n*-6 fats and by the lesser biological activities of some *n*-3 mediators, compared with their *n*-6 counterparts. Dietary enrichment of *n*-3 PUFA has been used with benefit in the treatment of inflammatory diseases of joints, kidney, gut and skin. Long-term studies in rheumatoid arthritis show that this approach, in conjunction with pharmacotherapy, can be sustained in the long term (>5 years). A potential collateral benefit of this approach is reduced risk for adverse cardiovascular events. Long chain *n*-3 PUFA found in fish and fish oil appear to be more potent as anti-inflammatory agents than shorter chain *n*-3 PUFA found in some vegetable oils. The latter can be useful as part of a broader dietary prescription and may have preventive effects.