

Interactions of dietary fibre and resistant starch with oil on genetic damage in the rat colon

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Background – Dietary fibre and resistant starch (RS) appear to promote the health of the large bowel through faecal bulking and increased fermentation. The influence of other dietary factors, such as polyunsaturated fatty acids (PUFA), on the effectiveness of these components is unclear.

Objective - To examine whether a rich source of (n-3) PUFA (fish oil; FO) and a rich source of (n-6) PUFA (sunflower seed oil; SSO) influence the effects of dietary fibre and RS on colonic DNA damage differently.

Design – Male Sprague-Dawley rats (~100 g) were fed one of eight different diets (eight animals per diet) for six weeks. Diets contained either 10% fibre (cellulose or wheat bran) or RS (HiMaize or Novelose) and each also contained 10% FO or SSO. At completion of the treatment period tissues and gut contents were collected for measurement of DNA damage (comet assay), short chain fatty acid (SCFA) concentrations and bacterial populations.

Outcomes – There were significant interactions between fibre/RS and oil treatments on colonic and caecal weights, and DNA damage, SCFA concentrations and some bacterial populations in the colon. DNA damage was higher for FO than SSO treatments in RS groups, whereas the reverse trend was evident for the fibre diets.

Conclusions- Dietary FO and SSO interact differently with fibre and RS in their ability to influence DNA damage in the large bowel of rats.