Reviewer's report

Title: New insights into the health effects of dietary saturated and omega-6 and omega-3 polyunsaturated fatty acids

Version: 1 Date: 2 April 2012

Reviewer: Peter PL McLennan

Reviewer's report:

• Major Compulsory Revisions
1. Whilst the two cited animal studies (ref 19,20) demonstrate the benefits of omega-3 PUFA over saturated fatty acids and omega-6 PUFA (and this has been demonstrated previously), they cannot be interpreted to advocate the reduction in either SFA or omega-6 PUFA but merely show the adverse effects of inadequate omega-3 PUFA intake. Is too bold to state (Page 3 end of para2) : “These data should close the controversy regarding the optimal dietary fatty acid profile to reduce the complications of CVD. Thus, maintaining high (or increasing) the intake of omega-6 – as still recently proposed [6,8,9] – in lieu of SFAs is definitely not the optimal strategy to prevent CVD complications.” Those references (6,8,9) do not advocate increasing omega-6 PUFA diets per-se. Rather they provide evidence (far more than is presented here in the form of meta-analysis of randomised controlled trials and other large studies), that intakes of 5-10% energy as omega-6 PUFA are cardioprotective relative to lower intakes (also demonstrated in animal studies) and reducing omega-6 PUFA intake provides no advantage. Inadequate evidence is provided in this mini-review to reject omega-6 PUFA compared to saturated fat for CVD protection.

2. The review should concentrate on the beneficial effects of correcting omega-3 PUFA deficiency in the diet (for which there is strong evidence) rather than advocating large reductions in omega-6 PUFA. (see point 3 below)

3. The potential cancer associations of high omega-6 PUFA intakes is a stronger argument than adverse CVD effects and this is where the emphasis should be if advocating reduced omega-6 intake.

• Discretionary Revisions
1. The authors introduce myocardial preconditioning, as a way of looking at the cardioprotective actions of omega-3 PUFA, highlighting “nutritional preconditioning” as first proposed in ref 19 being similar to the well established concept of “ischaemic preconditioning” (as first identified in ref 14). In this "mini-review" review it would be helpful if some mechanism could be proposed or alluded to. For example, ischaemic preconditioning involves a paradoxical protection induced by imposition of small non-damaging ischaemia that prevents the expected damage caused by more severe ischaemia. Is there likely to be a similar paradoxical effect of omega-3 PUFA?
2. The “controversy” (with respect to CVD) is more about the relevance of omega-3: omega-6 PUFA dietary ratio, and the references cited (and others not cited) demonstrate that the benefits of omega-3 PUFA can only be achieved by increasing omega-3 intake and not by reducing the omega-6 intake. Maybe the authors could include some discussion of this controversy?

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests