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Four Models Including Fish, Seafood, Red Meat and Enriched Foods to Achieve Australian Dietary Recommendations for *n*-3 LCPUFA for All Life-Stages

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Abstract: Populations are not meeting recommended intakes of omega-3 long chain polyunsaturated fatty acids (*n*-3 LCPUFA). The aim was (i) to develop a database on *n*-3 LCPUFA enriched products; (ii) to undertake dietary modelling exercise using four dietary approaches to meet the recommendations and (iii) to determine the cost of the models. Six *n*-3 LCPUFA enriched foods were identified. Fish was categorised by *n*-3 LCPUFA content (mg/100 g categories as "excellent" "good" and "moderate"). The four models to meet recommended *n*-3 LCPUFA intakes were (i) fish only; (ii) moderate fish (with red meat and enriched foods); (iii) fish avoiders (red meat and enriched foods only); and (iv) lacto-ovo vegetarian diet (enriched foods only). Diets were modelled using the NUTTAB2010 database and *n*-3 LCPUFA were calculated and compared to the Suggested Dietary Targets (SDT). The cost of meeting these recommendations was calculated per 100 mg *n*-3 LCPUFA. The SDT were achieved for all life-stages with all four models. The weekly food intake in number of serves to meet the *n*-3 LCPUFA SDT for all life-stages for each dietary model were: (i) 2 "excellent" fish; (ii) 1 "excellent" and 1 "good" fish, and depending on life-stage, 3–4 lean red meat, 0–2 eggs and 3–26 enriched foods; (iii) 4 lean red meat, and 20–59 enriched foods; (iv) 37–66 enriched foods. Recommended intakes of *n*-3 LCPUFA were easily met by the consumption of fish, which was the cheapest source of *n*-3 LCPUFA. Other strategies may be required to achieve the recommendations including modifying the current food supply through feeding practices, novel plant sources and more enriched foods.

Keywords: omega-3 long chain polyunsaturated fatty acids (*n*-3 LCPUFA); recommended intakes; suggested dietary target intakes; omega-3 (*n*-3) enriched foods; dietary modelling

1. Introduction

There is a growing body of evidence worldwide that the consumption of omega-3 long-chain polyunsaturated fatty acids (*n*-3 LCPUFA), namely eicosapentaenoic acid (EPA), docosapentaenoic acid (DPA) and docosahexaenoic acid (DHA), is associated with numerous health outcomes, specifically in cardiovascular disease prevention [1,2]. The National Health and Medical Research Council (NHMRC) has set Nutrient Reference Values (NRV) for *n*-3 LCPUFA [3], which differ by life-stage and gender. The NHMRC Suggested Dietary Targets (SDT) is defined as "A daily average intake from food and beverages for certain nutrients that that may help in prevention of chronic disease". The SDT apply to adults and adolescents 14 years and over and the SDT for *n*-3 LCPUFA are set at 610 mg/day for men and 430 mg/day for women. The International Society for the