Omega-3s for Baby Boomers: Outcomes from a Scientific Consensus Workshop

W. Morgan and M. Cashion

Translating the scientific evidence on omega-3 fatty acids (omega-3s) into effective communications and practical solutions to achieve optimal intakes for good health are key objectives of The Omega-3 Centre (O3C).

To better understand the strength of evidence for the health benefits of omega-3s for Baby Boomers, the O3C brought together leading experts at a workshop held at the CSIRO in Sydney, July 2008. The outcome is a Scientific Consensus Report on omega-3s and the health of Baby Boomers to help raise community and government awareness and understanding of this important nutritional issue.

Who are Baby Boomers?

This is a term given to those born from 1946 to 1965 during a lengthy period of high birth rates after the end of World War II. Approximately 24% of the population are Baby Boomers and it is projected that this will increase to 26% in 2021 (ABS 2004).

Australians have one of the highest life expectancies in the world with average life expectancy for Baby Boomers around 75 years for males and 80 years for women (AIHW 2008). However along with increased longevity is an increase in the incidence of chronic diseases, many of which are diet-related, such as obesity, Type 2 diabetes, osteoporosis, cancer, cardiovascular diseases (CVD) and arthritis.

There is increasing scientific evidence for the role of long chain omega-3s in the prevention of many chronic diseases as well as health maintenance.

Omega-3 intakes are low compared to recommended intakes

Adults’ median intake of long chain omega-3s is 121 mg/d which is about 50% of their mean intakes (246 mg/d) (Howe & others 2006). This difference, particularly of DHA and EPA, is likely to reflect a less common consumption of fish – the main source of long chain omega-3s. In other words a small proportion of the population eats large quantities of fish but most consume very little (Figure 1).

Despite eating more than other age groups, Baby Boomers have only modest intakes of fish: around 30 g/d on average compared to more than 155 g/d of meat and poultry (ABS 1999).

Both government agencies and health professionals can play an important role in the promotion of increased intakes of long chain omega-3s. Their activities should address barriers to increased consumption and take the form of a cooperative approach to ensure consistency and strength of messages.

Omega-3 in mood and cognition

The long chain omega-3, docosahexaenoic acid (DHA), plays a fundamental role in brain structure and function. Epidemiological and cross-sectional studies have also identified a role for long chain omega-3s in the etiology of depression. The potential mechanisms to account for these benefits include reductions in prostaglandins derived from arachidonic acid, leading to decreased brain derived neurotrophic factor (BDNF) levels and/or alterations in blood flow to the brain (Tassoni & Sinclair 2008).

Observational studies support the relationship between intakes of omega-3s and altered mood and cognition which need to be confirmed by thorough intervention studies using sufficiently sensitive tests designed to measure effects in mood and cognition.

Vision and maintaining eye sight

Omega-3s, particularly DHA, constitute a high proportion of the human retina and macular composition, and may be important in cell membrane maintenance and retinal repair following oxidative stress. They may also protect against retinal inflammation (Connor 2000, SanGiovanni & Chew 2005).

The Blue Mountains Eye Study (BMES), a population-based cohort study of vision and common eye diseases in 2895 people aged 49 years or older, examined the association between dietary fat and fatty acid components and the five year incidence of age-related macular degeneration (AMD) (Chua & others 2006).

Figure 1. Comparison of actual intakes of long chain omega-3s to recommended optimal intakes (mg/d) (Howe & others 2006, NHMRC 2006).
Results included:
- Participants with the highest versus the lowest intake of omega-3s had a lower risk of AMD (odds ratio 0.41)
- There was a 40% reduction of incident early AMD associated with fish consumption of at least once a week
- Fish consumption of at least three times a week reduced the incidence of late AMD by 75%
- People with higher intakes of omega-3s had a 42% reduction in incident nuclear cataract.

Overall, findings from a range of epidemiological studies and a recent meta-analysis (Chong & others 2008) support the hypothesis that increased dietary intakes of omega-3s and regular fish consumption protect against the development and progression of AMD. A plausible mechanism is that long chain omega-3s promote healthy ocular tissue by regulating inflammatory and immune responses in the retina, thereby reducing the risk of AMD.

Weight maintenance
Howe and Buckley (2008) assessed the evidence for a role of long chain omega-3s in body weight and found that most evidence of body fat reduction in humans comes from short-term studies (3–12 weeks in duration) which have shown around 1.5 kg reduction in body fat or body weight. Currently there is little evidence of longer term benefits of long chain omega-3s supplementation, and it is unclear how much is required to attain the benefit and whether EPA or DHA is more effective.

Despite these limitations, in a large proportion of overweight individuals at risk of metabolic syndrome, the multifaceted health benefits of long chain omega-3s supplementation, both cardiovascular and metabolic, provide strong justification for this weight management approach.

Inflammation including arthritis
Fish oil in sufficient doses has anti-inflammatory and analgesic effects (Cleland 2006). Inflammatory diseases in which fish oil has been shown to have beneficial effects include rheumatoid arthritis, systemic lupus erythematosus, IgA nephropathy, Crohn’s disease and psoriasis.

Rheumatoid arthritis has been the most thoroughly studied with beneficial effects being shown on meta-analysis using Cochrane methodology (Goldberg & Katz 2007).

Three months of treatment with 3 g or more of long chain omega-3s may be necessary for improvement in symptoms. These doses are substantially greater than those needed to show cardiovascular benefit and when taken regularly for three months or more achieve a similar reduction in pain scores to commonly used analgesic type anti-inflammatory drugs.

Table 1. Ranking of current level of evidence for long chain omega-3s.

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Meaning</th>
<th>Area</th>
<th>Evidence strength</th>
<th>Dose/dietary intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>+1</td>
<td>Interesting evidence</td>
<td>Mental health: Depression</td>
<td>Interesting, possible</td>
<td>Not possible to define</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mood</td>
<td>Weak evidence to date, important to follow up</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cognition</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dementia, Alzheimer’s disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+2</td>
<td>Positive evidence, no harm</td>
<td>Obesity</td>
<td>Interesting but insufficient evidence to date</td>
<td>Not possible to define</td>
</tr>
<tr>
<td>+3</td>
<td>Some good evidence</td>
<td>Metabolic health</td>
<td>Possible</td>
<td>Not possible to define</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visual health</td>
<td>Possible</td>
<td>Not possible to define</td>
</tr>
<tr>
<td>+4</td>
<td>Conclusive evidence</td>
<td>Vision: age-related macular degeneration</td>
<td>Probable (no intervention trials at this stage)</td>
<td>2 serves fish/week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long term analgesia associated with rheumatoid arthritis</td>
<td>Convincing</td>
<td>3 g/d EPA + DHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cardiovascular disease: prevention</td>
<td>Convincing</td>
<td>500 mg/d EPA + DHA = 2–3 serves oily fish/week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>management of existing disease</td>
<td>Convincing</td>
<td>1 g/d EPA+DHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blood triglycerides</td>
<td>Convincing</td>
<td>1.2–4 g/d EPA+DHA (or DHA alone)</td>
</tr>
</tbody>
</table>

NSAID = non-steroidal anti-inflammatory drugs.
Cardiovascular disease and omega-3 fatty acids

This area has been investigated extensively and evidence is convincing that fish and fish oil consumption reduces the risk of cardiovascular disease and consumption of DHA, EPA and ALA improves cardiovascular outcomes (Colquhoun 2008, NHFA 2008). The Omega-3 Index will be a useful tool for assessing this risk in the future. The evidence is also strong for the use of long chain omega-3s in the lowering of high blood triglyceride levels (Keske 2008).

Increasing intakes of long chain omega-3s through greater consumption of oily fish, enriched foods and drinks and fish oil supplements will benefit many Australians.

Recommendations

The Report recommends more research in several areas including a cost benefit analysis to assess the potential contribution of an optimal intake of long chain omega-3s on health status and healthcare costs.

The expert panel found that there is no evidence of harm to Baby Boomers from long chain omega-3s. The evidence is positive and is rated from interesting (+1) to conclusive (+4) for effects on mental health, obesity, metabolic syndrome, vision, rheumatoid arthritis and cardiovascular disease (Table 1).

Copies of this report and the 2007 report on omega-3s for children are available from the O3C. For more information visit www.omega-3centre.com.

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References


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