

ISSFAL 2012, Vancouver: Conference report

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The International Society for the Study of Fatty Acids and Lipids (ISSFAL) held their biennial conference 26th – 31st May 2012 at the Westin Bayshore Hotel in Vancouver. The conference was attended by over 450 delegates from academia, research, industry and various Government agencies, as well as a large number of research students. The conference was sponsored by several commercial organizations, and there were trade stands representing industries involved with nutritional supplements, clinical nutrition products, lipid ingredient supply and analysis. The breadth and depth of those attending represents current focus in this area of research and the development of areas of interest spanning new disciplines.

The full programme is available at <http://www.issfal2012.com/program.html>, however here is an overview of the plenary topics:

- Pathways for the generation of dysfunctional DHA
- DHA and retinal function
- 21st century preventative cardiology: lipoproteins not lipids
- Novel PUFA derived mediators and functionality
- Fatty acids and regulation of gene expression
- Nutrition, lipids and global child health
- Cellular and circuit level imaging during and after stroke
- Membrane lipid-protein function
- Fatty acids and cell signaling
- Triglycerides and digestion and transport
- Fatty acids and immune function
- Genetics and fatty acid-binding proteins

In addition, there were two very relevant Global Interest Lectures

- Innovations in fats for human health – Brent Flickinger, Senior Manager at Archer Daniel Midland Company, a major producer of foodstuffs, animal feeds, fuels and chemicals from crops.
 - Brent gave an overview of some of the recent health reports/guidelines in the US, highlighting how they are failing to meet the health needs of the population (i.e. being overweight is now *typical* in the US, and many guidelines are contradictory and can compromise the health of some of the population)- he suggested that low fat may not be the most important health message.
 - He also reviewed some of the recent innovations in fats including novel ways to increase n-3 PUFA in the diet (SDA soybean oil and transgenic pigs with increased capacity for n-3 storage), the use of fats in controlling appetite (mediated through buccal tissue mechanisms), and also the development of novel oil blends with optimal profiles (e.g. canola and flax, increasing n-3 without increasing n-6).
- NB: an additional symposia entitled 'Designer and novel oils and human health' was added to the programme in response to the influx of abstracts in this area
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- Fishless Future – what are we doing to the oceans ? – Villy Christensen, Professor and Associate Director, Fisheries Centre, UBC.

- Villy presented the evidence for global shifts in the needs and supply of seafood which threaten our ability to ensure adequate and equitable supplies in the future. This highlighted factors that are beyond our immediate influence, but also indicated ways in which we, as scientists and consumers, can strategize to manage inevitable changes (i.e. by controlling distribution, reducing/moderating reliance on supplies and particular species). He also introduced an interactive 3D gaming programme which is aimed at engaging the public in their roles and responsibilities in this (the Nereus Program)

The poster 'Post-prandial effects of a meal rich in long-chain omega-3 fatty acids on indicators cardiovascular risk' (attached as pdf) was displayed throughout the first full day of the conference. There was an opportunity to discuss the poster with delegates during the evening Cheese and Wine event, which resulted in a large attendance! An overview of the feedback and discussions is given below:

- There was much interest in our application of the Omega Bloodcount Test™ for assessing fatty acid levels in whole blood. As discussed above, this minimally invasive technique provides an opportunity for studies in healthy volunteers and clinical populations that might otherwise be restricted due to the volumes of blood normally required. In addition, our study used a validated FFQ as a minimally invasive method of gathering valuable intake data. The validation of the FFQ and its relationship to the measures of whole blood fatty acid levels was previously presented at Experimental Biology 2011 (McKenzie, O'Callaghan and Bell) and subsequent interest in the application of these techniques indicates that the publication of this earlier work must be submitted as a matter of urgency, and preferably before publication of the project presented in this poster.
- Another poster presented a similar whole blood lipid analysis methodology where sample stability had been improved by using a custom made preservative (to replace BHT). The author, Bill Harris, Uni of South Dakota and OmegaQuant, offered to send some samples of the preservative to try. Incidentally, stability with BHT was still very good and gradual reduction in fatty acid levels during storage was non-selective and only influenced total amount rather than relative amounts.
- It was suggested that, as we are perturbing total blood lipid levels with our meal, it might be better to express our whole blood lipid levels as mg/g fat (Fig 6) so that the apparent decrease in DHA is removed.
- It was acknowledged that there is a need to identify clear markers of CVD risk that respond to dietary manipulation. Traditionally lipid levels have been used, as in our study, however there is emerging evidence that lipoprotein particle numbers is more influential for the risk of CVD – although this may be captured in measure of total lipid levels, a greater abundance of particles, rather than larger particles, may be associated with increased risk.

Other areas of interest to our current research activities included:

- Several papers introduced evidence for the possible satiating effect of long-chain omega-3 fatty acids, in particular DHA. In addition, the Martek/Life trade stand featured a product specifically combined and marketed towards appetite control for weight loss/maintenance. The Actilean™ Bar provides 350mg DHA and 15g Protein in a 180kcal peanut butter and chocolate snack bar.

- The Martek/Life's DHA™ trade stand also presented a wide range of foods enriched using the Martek Marine Algae source of DHA (marketed as Life's DHA™). The products ranged from breads, milks, cereal bars, pancakes etc..... all providing relatively small amounts of DHA. The rationale of incorporating a vegetarian source of DHA into a variety of widely consumed products is to improve overall intakes within a population, especially in those who do not eat fish. The products on display are currently only available in the US however a similar concept of adding fish oil to regularly consumed items has been explored in the UK by several food manufacturers (Allied Bakeries – bread, St Ivel – milk, Birds Eye/Youngs – fish fingers) and I anticipate that it will be revisited again. This highlights several emerging concepts to which our research/commercialization activities are aligned:
 - Issues around the sustainability of fish as a food commodity is leading to the development of alternative sources and creative approaches to ensuring intakes of EPA and DHA in the population. Marine algae is a vegetarian source of EPA and DHA, however it is expensive and it's incorporation into foods may be limited to relatively small amounts. Other alternatives include the genetically modified soya bean oil which has the potential to be incorporated more widely in the diet however it relies on post-prandial metabolic conversion to EPA and DHA and its viability may be influenced by processing and cooking.
 - The majority of the products were marketed towards young children, with a clear focus on the potential benefits for cognitive ability in children. Regardless of the source of the long-chain omega-3 fatty acids, strategies to achieve adequate and potentially supplemental intakes in childhood remain the key area of interest. This supports our research interest in positively influencing oily fish consumption in the very young and also ensuring adequate provision in school meals.
- The vast majority of trade stands were concerned with supplements of fatty acids. International companies, such as Nordic Naturals, Equazen™, AkerBiomarine, in various forms. Although most were targeted at children, as mentioned above, there were a significant number of products marketed towards adults. These products appeared to claim benefits in improving memory, reducing CVD risk, and reducing inflammation (joints).
- Joe Hibbeln, Lead Clinical Investigator, NIH, presented 'A century of linoleic acid: endocannabinoids, obesity and addiction' where he discussed epidemiological evidence indicating that many of the current health issues relate more to increasing intakes of linoleic acid rather than deficits in n-3 fatty acids.

If you require further information or would like to review the Programme, please contact Jane McKenzie: jmckenzie@qmu.ac.uk