

Global Omega-3 Summit: a Kyoto-type approach

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On March 3 and 4, 2011, a Global Omega-3 Summit was held in Bruges, Belgium. There, 13 keynote speakers and 60 participants discussed the role of long-chain (LC) omega-3 fatty acids in health and mental health; what the dietary requirements should be; steps needed to improve food quality in developed and developing countries; and how to match omega-3 needs with food availability, sustainability, and alternative sourcing. Participants were scientists and representatives from government bodies as well as food industry and industry associations from 15 countries.

By the end of the meeting, participants and leading expert speakers such as Michael Crawford, a professor at Imperial College (London, UK); Clemens von Schacky, a professor at the Medical Center of the University of Munich (Munich, Germany); Fabien De Meester, chief executive officer of DM Frontiers (Brussels, Belgium); Captain Joseph Hibbeln, a lead clinical investigator at the National Institutes of Health (Bethesda, Maryland, USA); and Norman Salem, chief scientific officer at Martek Biosciences Corp. (Columbia, Maryland, USA) had agreed on six consensus statements that should shape future policy development as well as bring the right quality and quantity of LC-omega-3s to people around the world, thus guaranteeing a proper management of the risks linked to low LC-omega-3 consumption.

1. *Brain and heart disorders resulting from LC-omega-3 (EPA + DHA, i.e., eicosapentaenoic acid + docosahexaenoic acid) deficiency are the biggest challenges for the future of humanity.* The associated current and future costs could easily bankrupt health care systems and



Nutrition panel at the Global Omega-3 Summit (from left to right): Alexandra Richardson (Oxford University, Oxford, UK), Norman Salem (Martek Biosciences Corp.), Nico van Belzen (International Life Sciences Institute Europe, Brussels, Belgium), Clemens von Schacky (University of Munich), Michael Crawford (Imperial College), and Captain Joseph Hibbeln (National Institutes of Health, USA).

cause wider economic instability in the world. Mental health issues are already a larger threat to the world than the obesity epidemic.

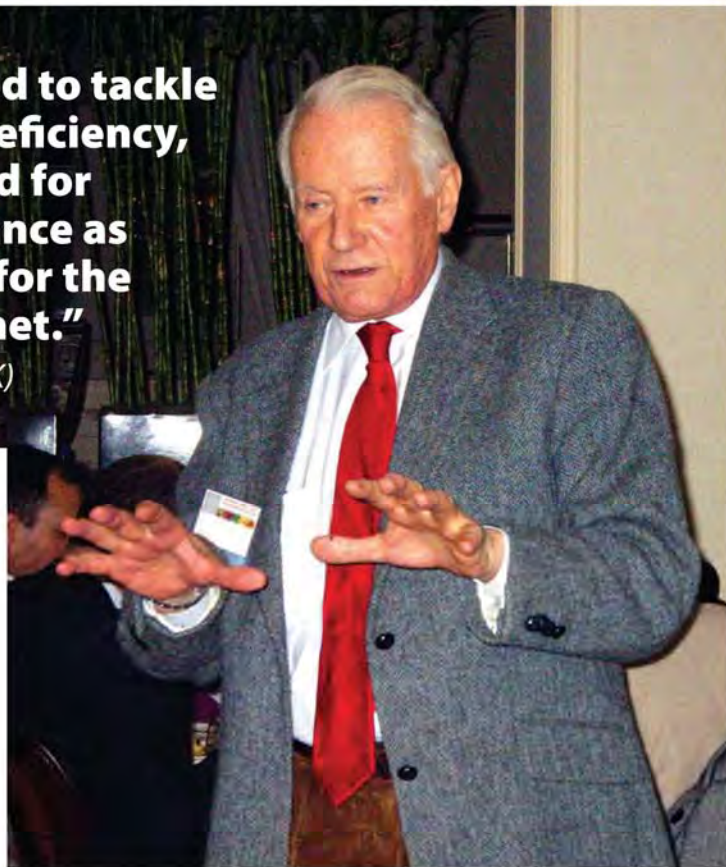
2. *Tissue concentrations of LC-omega-3 (relative to LC-omega-6) are the key variable for health—not dietary intakes.* As to dietary requirement of LC-omega-3 fatty acids, consensus was reached that these cannot be given as simple values, as they depend significantly on external factors such as the type of diet, including the presence or absence of omega-6 fatty acids, and/or genetic factors. This uncertainty is reflected by differences in existing official recommendations ranging from 200 mg/day (e.g., Health Council of the

Netherlands, 2001) to 1,100 mg/day (e.g., British Nutrition Foundation Task Force, 1992).

It was recognized that what is important is not dietary intake as such but the levels obtained in human tissue: the “Tissue is the Issue.” A good idea of tissue levels can be obtained by measuring the Harris-von Schacky Omega-3 Index. The Omega-3 Index is the EPA + DHA level expressed as a percentage of total fatty acids in red blood cells. An alternative could be the “Lands index,” which gives a percentage of “higher unsaturated fatty acids” (HUFA) of the omega-3 series to total HUFA (similar in total plasma,

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—Michael Crawford, Imperial College (London, UK)



plasma phospholipids, and tissues). These biomarkers can be determined in easily accessible tissues. However, it is emphasized that standardized analytical procedures must be strictly followed.

3. *An intake of at least 1,000 mg EPA + DHA is recommended for people consuming a typical Western-type diet.* For people around the world, an Omega-3 Index of 8 to 11% is considered to be the target. In order to reach this level in 97.5% of a population eating a typical Western type diet, an intake of at least 1000 mg EPA + DHA is recommended. In other parts of the world recommended intake levels could be different. Japanese people, for example, have a very healthy Omega-3 Index of about 12 corresponding with about 50% of HUFA-3 of total HUFA in tissues.

4. *Shorter-chain omega-3 fatty acids (α-linolenic acid, stearidonic acid, and EPA) are poorly converted to DHA in humans.* While EPA and DHA have other effects, it was considered that not enough data are available to make specific recommendations for each of these fatty acids separately, except that both fatty acids are required. Shorter-chain omega-3 fatty acids such as α-linolenic acid, stearidonic acid, and even EPA have poor and variable conversion to DHA in humans. This necessitates the increased availability of DHA for human consumption. To make tissue targets feasible, we also urgently need to reduce consumption of linoleic acid while increasing the consumption of omega-3 fatty acids, including α-linolenic acid, in human and animal diets.

5. *To make these omega-3 targets feasible, we also urgently need to increase the availability of LC-omega-3 fatty acids and especially of DHA for human consumption in a sustainable and environmentally responsible way.* Fish and krill stocks need to be managed and harvested properly; aquatic agriculture is one of the many possible roads to a responsible and sustainable production system. Other sources of LC-omega-3s such as through algae or yeast fermentation, or through production of precursors in crops with, for example, high levels of α-linolenic acid, stearidonic acid, or other omega-3s will equally well be needed to guarantee sufficient supply for the 9 billion people expected to live on Earth by 2050.

6. *Education of all stakeholders is essential to obtain these targets.* Without a broad understanding and acceptance of the preceding statements, it will be difficult if not impossible to prevent a spreading endemic of mental health issues. Communicating effectively about LC-omega-3 deficiencies and needs and developing strategies to produce and make these available in a responsible way will require the support of stakeholders around the globe.

This last point was summarized eloquently by Michael Crawford: “A Kyoto-type approach is needed to tackle the global issue of LC-omega-3 deficiency, which is of similar size and spread for human (mental) health maintenance as the carbon dioxide issue may be for the environmental health of our planet.”

The Consensus Statements and PDF copies of the presentations of the Omega-3 Summit can be obtained online at www.omega3summit.org; selected presentations and the consensus conclusions of the summit will also be published by Springer Humana Press in 2012 (De Meester, F., and R. Watson, eds).

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