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Workshop on the Essentiality of and Recommended Dietary Intakes for Omega-6 and Omega-3 Fatty Acids

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The Workshop on the Essentiality of and Recommended Dietary Intakes (RDIs) for Omega-6 and Omega-3 Fatty Acids was held at The Cloisters, National Institutes of Health (NIH) in Bethesda, Maryland, USA, April 7–9, 1999. The workshop was sponsored by the National Institute on Alcohol Abuse and Alcoholism-NIH, the Office of Dietary Supplements-NIH, The Center for Genetics, Nutrition and Health, and the International Society for the Study of Fatty Acids and Lipids; and cosponsored by several industry groups[1].

The workshop participants consisted of investigators of the role of essential fatty acids in infant nutrition, cardiovascular disease, and mental health. The first two areas were selected because they are the ones where extensive studies involving animal models, clinical intervention trials, and biochemical and physiologic mechanisms and their function have been carried out relative to omega-6 and omega-3 fatty acids. The role of essential fatty acids in mental health is a new, but promising research area.

The workshop was truly international in nature bringing together scientists from academia, government, international organizations, and industry, from Australia, Canada, Denmark, France, Italy, Japan, Norway, Switzerland, United Kingdom, and the United States.

The first two days of the workshop consisted of presentations and extensive discussions. The format of the workshop was Round Table permitting extensive discussion following individual presentations and at the completion of each session. The first day consisted of Session I. Principles to be Considered in Determining Essentiality and DRIs and Session II. Essential Fatty Acids and Central Nervous System Function. Day two began with Session III. Cardiovascular Disease and ended with Session IV: Relationship of Essential Fatty Acids to Saturated, Monounsaturated, and Trans Fatty Acids. On the morning of the third day, during Session V. Dietary Recommendations and Omega-6:Omega-3 Ratio (LA, LNA, AA, EPA, DHA), industry representatives reported on studies supported by their companies, on clinical interventions, and product development. Representatives from the U.S. Department of Agriculture (USDA), the Pan American Health Organization/World Health Organization (PAHO/WHO) and the Food and Agriculture Organization of the United Nations (FAO) presented their agencies' scientific studies or policies on the dietary intake of fatty acids, especially essential fatty acids, and their activities in the field.

One recommendation deserves explanation here. After much discussion consensus was reached on the importance of reducing the omega-6 polyunsaturated fatty acids (PUFAs) even as the omega-3 PUFAs are increased in the diet of adults and newborns for optimal brain and cardiovascular health and function. This is necessary to reduce adverse effects of excesses of arachidonic acid and its eicosanoid products. Such excesses can occur when too much LA and AA are present in the diet and an adequate supply of dietary omega-3 fatty acids is not available. The adverse effects of too much arachidonic acid and its eicosanoids can be avoided by two interdependent dietary changes. First, the amount of plant oils rich in LA, the parent compound of the omega-6 class, which is converted to AA, needs to be reduced. Second, simultaneously the omega-3 PUFAs need to be increased in the diet. LA can be converted to arachidonic acid and the enzyme, Δ-6 desaturase, necessary to desaturate it, is the same one necessary to desaturate LNA, the parent compound of the omega-3 class; each competes with the other for this desaturase. The presence of LNA in the diet can inhibit the conversion of the large amounts of LA in the diets of Western industrialized countries which contain too much dietary plant oils rich in omega-6 PUFAs (e.g. corn, safflower, and soybean oils). The increase of LNA, together with EPA and DHA, and reduction of vegetable oils with high

[1]BASF Corp., USA; BASF Health and Nutrition A/S; Bestfoods; ENRECO; F. Hoffmann-La Roche, Ltd.; Groupe Danone; Kraft Foods, Inc.; Martek Biosciences Corporation; Mead Johnson Nutritionals; Ocean Nutrition Canada, Ltd.; Omega Tech, Inc.; Pronova Biocare; and Roche Vitamins, Inc.

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