



Do children eat enough essential fats? Experts meet at major European nutrition conference

“You are what you eat” – this saying is so well embedded in people’s mind that it drives unconsciously many of their food choices. When it comes to fats, the common belief is that eating fat makes you fat. This is a complete mismatch with the scientific reality for both adults and children. Children need to eat the right types of fat for their growth and development as well as their future health.

On October 27th 2011 in Madrid, experts met during the 4-yearly meeting of FENS (Federation of European Nutrition Societies) to get the facts right. More than 100 scientists and practitioners were given clarity on the current science on the role of essential fats in child development by four key note speakers: Professor Ricardo Uauy¹, Professor Berthold Koletzko², Professor Olli Simell³ and Doctor Joachim Heinrich⁴. A smaller group of experts also held a satellite workshop led by Mrs Connie Diekman⁵, RD to practice assessing scientific accuracy and translating the science knowledge into clear and simple messages for health professionals and the general public. This was the fourth activity of the International Expert Movement (see box).

Scientific summary: Why do children need fat in their diet and what type of fat?

For their growth (Prof Uauy)

Fats are an important source of energy for infants and children; they constitute a major energy store in the body; they enhance the taste and acceptability of foods and trigger satiety; they are also a vehicle for the absorption of lipid soluble vitamins (vitamins A, D, E and K). Importantly, fats provide essential fatty acids linoleic acid (LA, omega-6) and alpha-linolenic acid (ALA, omega-3). These essential fatty acids are required for optimal health, but cannot be made by the body and thus must come from the diet. Evidence from the 60’s showed that neonates and young infants fed with formula deprived of essential fats failed to thrive and developed skin alterations. These reverted when sufficient linoleic acid preparations were provided⁶. Studies during the 80’s with subjects fed by total parenteral nutrition demonstrated the essentiality of alpha-linolenic acid also⁷. Additionally, recent controlled studies of malnourished children in Africa and the

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⁶ Hansen AE et al, *Pediatrics* 1963;31:171-192.

⁷ Holman RT et al. *Am J Clin Nutr* 1982;35:617-23; Bjerve KS et al. *Am J Clin Nutr* 1987;45:66-77.



America's who were receiving supplementary nutrients including omega-3 and -6 fatty acids, indicated beneficial effects of essential lipids on growth during the first years of life.⁸ The recently updated FAO/WHO recommendations⁹ describe the essential fatty acids requirements to support children growth as follows: after receiving breast milk, infants and young children (6-24 months) should gradually reduce their fat intake to 35% of energy (%E), depending on physical activity, among which 3-4.5%E should be linoleic acid (omega-6), 0.4-0.6%E should be alpha-linolenic acid (omega-3), and the diet should also provide 10-12 mg/kg of the longer chain omega-3 fatty acid docosahexaenoic acid (DHA). Currently the minimum level of 20%E of total fat is not achieved in several developing and emerging countries, and the association between stunting and obesity raises the question of the quality of fat¹⁰. In many low-income countries¹¹ but also developed countries¹², the maternal intake of essential fatty acids and of omega-3 fatty acids in particular is below recommendation. This causes breast milk to contain relatively low amounts of longer-chain more unsaturated derivatives such as DHA, resulting in a sub-optimal intake of these compounds by their infants¹³.

For their neural development (Prof Koletzko)

Beyond the role of essential fats in children's growth, much attention has been paid to their role in neural development at early ages. Essential fatty acids can be elongated into their longer-chain more unsaturated derivatives arachidonic acid (ARA, omega-6 from linoleic acid), and eicosapentaenoic and docosahexaenoic acids (EPA and DHA, omega-3, both from alpha-linolenic acid). ARA and DHA acid are rapidly deposited in brain and retina during early growth. Cognitive development can be influenced by cultural, genetic and nutritional factors. There is compelling evidence that one of these factors is the DHA supply to pregnant and lactating women and their infants¹⁴. Recent studies indicate that the potential benefit of DHA for neural function, performance and behaviour may also be present at later ages¹⁵. The specific role of DHA in each age and critical stage of development remains to be determined. Based on the current scientific evidence, consensus recommendations are that pregnant and lactating women should aim at achieving adequate intakes of the parent essential fatty acids LA and ALA as well as an average DHA intake of at least 200 mg/day¹⁶. This can usually be reached with 1 or 2 portions of ocean fish per week if fatty fish is included. For infants, DHA supply (100 mg/d) should persist after breastfeeding for up to 2 years. Older children should then

⁸ Adu-Afarwuah S et al *Am J Clin Nutr* 2007;86:412-20; Mardones F et al., *Public Health Nutr* 2008;11:30-40; Ramakrishnan U et al *Food Nutr Bull* 2010;31:S108-16.

⁹ FAO/WHO. *Fats and Fatty acids in human nutrition; Report of an expert consultation. 10-14 november 2008, Geneva.*

¹⁰ Popkin BM et al. *J Nutr* 1996;26:3009-16;

¹¹ Michaelsen et al. *Maternal and Child Nutrition* (2011), 7 (Suppl. 2), pp. 124-140; Kuipers RS et al, *J Nutr*. 2011 Mar;141(3):418-27. Epub 2011 Jan 26.

¹² Ervin RB et al. *Adv Data* 2004;8:1-6.

¹³ Rocquelin et al. *Public Health Nutr* 2003;6:241-8; Yuhas et al. *Lipids*. 2006 Sep;41(9):851-8. Yakes et al *Br J Nutr* 2011;105:1660-70; Yakes et al *J Pediatr Gastroenterol Nutr* 2011;52:351-9.

¹⁴ Hibbeln JR et al, *Lancet* 2007;369:578-85; Oken E et al, *Am J Clin Nutr* 2008;88:789-96; Oken E et al, *Am J Epidemiol*. 2008 May 15;167(10):1171-81.

¹⁵ McNamara et al, *Am J Clin Nutr*. 2010;91:1060-7. Kim et al, *Acta Paediatr*. 2010 Jan;99(1):72-7. Beblo et al, *Neurology* 2001;57:1488-91; Beblo et al, *J Pediatr*. 2007;150:479-84.

¹⁶ Koletzko B et al, *Br J Nutr*. 2007 Nov;98(5):873-7.



adopt dietary habits in line with preventive advice for total population (adequate intake of essential fatty acids LA and ALA plus 2 portions fish/week, including some oily fish to reach ~250mg/day EPA/DHA)^{9,17}.

What about fats and risks of allergy? (Dr. Heinrich)

So, essential fatty acids are needed for child growth and DHA benefits mental development during foetal development and infancy, and possibly in childhood and adolescence. However, a recurrent concern has been that a high intake of omega-6 fatty acids combined with a low consumption of omega-3 fatty acids (as is, typical for the present Western diet), could be a main contributor to the asthma epidemic¹⁸. A plausible biological mechanism on inflammation and allergy mediators was suggested. However, epidemiological data for infants and children are so far confusing and contradictory. In terms of prevention of allergy and asthma, observational and intervention studies suggest a positive impact of maternal omega-3 fatty acid intake during pregnancy and lactation, but further data need to be collected before recommendations can be made¹⁹. In terms of treatment, the current consensus is that fish oil supplementation cannot be recommended in asthma²⁰. A reason for the heterogeneity of results might be genetic. Fatty acid composition in blood is under strong genetic control of the FADS gene cluster, which was very recently shown to influence the relationship between fatty acid intake and several atopic outcomes²¹. In summary, the current data is insufficient to support the notion of a protective effect by omega-3 fatty acids and an adverse effect of omega-6 fatty acids on allergies. However, much research remains to be done before a firm conclusion can be drawn on this topic, in particular with respect to fat intake during pregnancy and potential effect modifications by gene variants. The current FAO/WHO recommendations state that there is no rationale for a specific recommendation for omega-6 to omega-3 ratio, or LA to ALA ratio, if intakes of omega-6 and omega-3 fatty acids are within the recommended range⁹.

Can we actually change children's diet via counselling and what is the impact on cardiovascular risk factors? (Prof. Simell)

Taking care of the quality of fats in mothers and children's diet is thus crucial for children's growth and development. Is it actually possible to influence it via dietary counselling, and does it also have an impact on cardiovascular health of the children? The important STRIP study (Special Turku Coronary Risk Factor Intervention project) in Finland is a very convincing example. More than 20 years ago, over 1000 babies were recruited at 7 months of age. The parents of half of this group received dietary advice for their children twice a year aimed at adequate energy supply, with fat providing 30-35% energy, of which a third is polyunsaturated (PUFA), a third is monounsaturated (MUFA) and a third is saturated (SAFA), and cholesterol intake is below 200 mg per day. These

¹⁷ EFSA Journal 2010; 8(3):1461.

¹⁸ Black PN and Sharpe S Eur Respir J. 1997 Jan;10(1):6-12.

¹⁹ Klemens et al. BJOG. 2011 Jul;118(8):916-25; Kremmyda et al. Clin Rev Allergy Immunol. 2011 Aug;41(1):36-66; Miyake Y et al. BMC Public Health 2011;11:358.

²⁰ ESPGHAN Committee on Nutrition (ESPGHAN 2011); Thien et al. Evid.-Based Child Health 6: 984-1012 (2011)

²¹ Lattka et al, Am J Clin Nutr. 2011 Feb;93(2):382-91; Standl M, Sausenthaler S, Lattka E, et al. FADS gene variants modulate the effect of dietary fatty acid intake on allergic diseases in children. Allergy 2011;41:1757-1766



babies are now 19 year old adults, and data show consistently over the years that those who received dietary counselling have a higher PUFA and lower SAFA intake than those who did not receive counselling, and more of them actually reached the healthy fat recommendations. This difference in diet also translated into cardiovascular risk factors: at 14 years of age, LDL-cholesterol and blood pressure were lower for children who received dietary counselling²². Family advice on fat quality in the diet can thus really influence the actual diet of children and influence cardiovascular risk factors in a beneficial way.

In short, why do children need fat in their diet and what type of fat?

Fats are important in children's diet and should bring 30-35% of energy; they influence food taste and acceptability, provide essential fatty acids that the body cannot make and are a vehicle for fat-soluble vitamins A, D, E and K. As for adults, when total calorie intake is appropriate, the fat quality in children's diet is more important than the fat quantity. Essential fats are needed for child growth and development but their intake falls below recommendations in many countries. DHA, the omega-3 long chain polyunsaturated fatty acid, has a well-recognized role in infant's neural development which might extend into childhood. Concerns that dietary omega-6 fatty acids would favour allergy while omega-3 fatty acids would prevent it are currently not supported by scientific evidence. Dietary counselling of parents and children on fat quality can have a clear impact on intakes of saturated, unsaturated and essential fats in the long term, with benefits on cardiovascular risk factors such as LDL-cholesterol and blood pressure.

Putting science into practice, how to relay these messages to the general public?

Scientific research is making progress in understanding the role of the different types of dietary fats for health. Some areas still require further research, but there are clear areas of consensus that allow international and national bodies to make the recommendations described above. However population data show that fat intakes are, in many cases, not meeting recommendations; children's obesity epidemic is expanding; and consumers are confused by conflicting messages they hear. There is definitely a need to bridge the gap between dietary recommendations and actual behaviour, and nutrition professionals have a role to play.

On Thursday 27th October in Madrid, Mrs Connie Diekman, RD led a satellite workshop for a group of academic and industry experts to practice translating scientific knowledge about fats quality in children's diet into clear and simple messages for health professionals and the general public. Consumers are confused about how much and what type of fat they should eat, and one of the reasons is the way new research is being reported in the media. Headlines often do not match the actual result of the research; do not take into account limitations of the studies and the overall body of evidence on the topic. Health professionals have their part of responsibility in improving ways to communicate science to the media, peers and the public, starting when they

²² Niinikoski H et al. *Circulation* 2007 Aug 28; 116(9): 1032-40; Niinikoski H et al. *Hypertension* 2009; 53:918-24



publish or comment on new research findings. An inspiring example of communication by the steering group “Choose Healthy Fats” in the Netherlands was shared²³. During the workshop, experts put into practice these insights on recent academic publications: what messages are put forward by the authors? Do they reflect properly the results of the study and the rest of the body of evidence? How and why results are sometimes turned into controversial headlines? What key messages about these case publications should be disseminated to health professionals and to the general public? Participants left the workshop with insights and methods they will use to communicate health messages with their peers, students, clients and patients; an additional step towards a better quality of fat in the diet.

Which messages to relay to the general public and how?

In spite of dietary recommendations about dietary fats for children, consumers are very confused, intakes do not match recommendations, and health problems such as obesity are expanding.

To reduce the gap between recommendations and reality, health professionals have the responsibility to convey simple and consistent messages to the general public, to critically look at new studies that might confuse consumers/peers when incorrectly reported, and always base their communications on the overall total body of evidence. Making sure the general population hears consistent messages is a necessary starting point to trigger behaviour change.

Such simple messages regarding the quality of fat for children are:

- A. Fat is a necessary part of the diet of children (and adults), and should bring about a third of the energy they get from food & drinks. To make sure children maintain a healthy weight, their level of physical activity should be adapted to their food intake.**
- B. Not only does the quantity of fat we eat matter, but also the quality or type of fat: for children: the fat type is particularly important for normal growth and development, as a source of essential fats and for the prevention of chronic diseases later in life.**
- C. Simple dietary changes can help limit the intake of unhealthy saturated fat intake and increase the proportion of healthy polyunsaturated fats:**
 - Exchanging full fat dairy products with low- or fat-free choices,
 - Exchanging fatty meats with lean meats and fish, and
 - Using unsaturated vegetable oils in food preparation and food products rather than saturated fats.

²³ www.kiesgezondvet.nl



About the International Expert Movement

The International Expert Movement is a movement that came to live after a meeting held in February 2009, in Barcelona. It brought together 40 leading global experts in the field of fats and health, originating from over 25 countries. This meeting marked an historic moment, helping to shift the public discourse around fats from: Eat less fat to Eat the right type of fat. The outcomes of this first meeting were reflected in an agreed and signed Summary Statement and sparked off an International Expert Movement (IEM).

This movement is on a mission to improve the fat quality of the diet of everyone, everywhere, by conveying simple messages that give clear guidance.

During international follow-up meetings in Bangkok (Oct 2009), Maastricht (May 2010) and Madrid (October 2011), the experts have put their own recommendations into practice, dealing with controversial topics in the area of lipid nutrition and heart health, or fat quality in children's diet. Delegates of the IEM at the global level then replicate the IEM on a local level to disseminate the learning's in their own circle of influence.

International activities of the IEM are held under the auspices of the International Union of Nutritional Sciences (IUNS) and funded through an unrestricted educational grant from Unilever.

Information on the IEM and its activities can be found on www.theiem.org.