# RECOMMENDATIONS ON DIETARY FAT INTAKE IN PREGNANCY

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## ABSTRACT

**Dietary fat intake in pregnancy and lactation affects pregnancy outcomes as well as child growth, development and long-term health. The European Commission charged the EU research project PERILIP, jointly with the EU Early Nutrition Programming Project, to develop recommendations on dietary fat intake in pregnancy and lactation This was approached by reviewing available evidence and by a consensus conference attended by some 50 experts including representatives of 10 international scientific associations. The adopted conclusions include: Dietary fat intake in pregnancy and lactation (E%) should be as recommended for the general population. Pregnant and lactating women should aim to achieve a dietary intake at least of 200 mg DHA/day on average. Intakes of up to 1 g/day of DHA or 2.7 g/day of n-3 LCPUFA were used in RCTs without significant adverse effects. Women of childbearing age should consume 1-2 two portions of fish per week, including fatty fish. Intake of the precursor, alpha-linolenic acid, is far less effective with respect to DHA deposition in fetal brain than the intake of preformed DHA. Intake of fish / n-3 LCPUFA results in a slightly longer pregnancy duration. Dietary inadequacies should be screened for during pregnancy, and individual counselling be offered if needed.**


## BACKGROUND

**Dietary fat intake of women during pregnancy affects pregnancy outcomes, and fat intake during pregnancy and lactation modulate the growth, development and long term health of their children.**
**Many observations suggest an important role of *n-3* fatty acids in prolonging gestation in enhancing fetal growth, in preventing complications of pregnancies like premature delivery, preeclampsia, IUGR and their consequence on newborns.**
***n-3* LC-PUFA docosahexaenoic acid needs to be deposited in good amounts in the central nervous system during the perinatal brain growth spurt, while *n-6* LC_PUFA Arachidonic acid accretion mainly occurs postnatally.**
**Other observations underlined the role of lipophilic vitamins (A, E, lycopene) in protection against oxidative damage that have a pivotal role in many pathologic conditions of pregnancy and the perinatal period (preeclampsia, rethinopathy ecc.).**
**In the last years the effects of supplementing pregnant women with *n-3* LCPUFA from different sources on pregnancy outcome have been evaluated in a number of randomized controlled clinical trials with a variety of results depending on type of supplement (fish oil or single cell oils), doses (150mg-2.7g/day) period of supplementation and quantity.**
**Moreover, higher DHA supplies during pregnancy and lactation and to the infant after birth has been associated with beneficial effects on the development of visual acuity, cognitive functions and attention, maturity of sleep patterns, spontaneous motor activity, immune phenotype and bone mineralization.**
**In view of the relevance of this issue for public health, the European Commission mandate the European Research Project PERILIP to develop recommendations on dietary fat intake in pregnancy and lactation, based on current scientific evidence.**

## METHODS

**Systematic literature reviews were performed about different topics:**
**1-effects of *n-3* polyunsaturated fatty acid intakes for women with low-risk pregnancies and with high risk pregnancies;**
**2-maternal polyunsaturated fatty acid intake during lactation and its effects on human milk composition and infantile outcome;**
**3-effect of antioxidant intakes in pregnant and lactating women;**
**4-toxicological evaluations on sea fish consumption in women of childbearing age;**
**5-effects of *n-3* fatty acid intakes and of antioxidants for pregnant women.**
**These reviews were discussed and evaluated in an expert workshop held from11-14 September 2005 at Wildbad Kreuth, Bavaria, Germany**

Consensus recommendations on behalf of the European Commission research projects Perinatal Lipid Metabolism (PERILIP, www.imperial.ac.uk/ agriculturalsciences/ Perilip/) and Early Nutrition Programming (EARNEST, www.metabolic-programming.org), developed in collaboration with representatives of the Child Health Foundation (Stiftung Kindergesundheit, www.kindergesundheit.de), the Diabetic Pregnancy Study Group (DPSG, www.medfak.uu.se/dpsg), the European Association of Perinatal Medicine (EAPM, www.europerinatal.com), the European Association of the Study of Diabetes (EASD, www.easd.org ), the European Society for Clinical Nutrition and Metabolism (ESPEN; www.espen.org), the European Society for Paediatric Gastroenterology, Hepatology and Nutrition, Committee on Nutrition (ESPGHAN; www.espghan.org), the International Federation of Placenta Associations (IFPA, http://aculeate.hopto.org/IFPA), the International Society for the Study of Fatty Acids and Lipids (ISSFAL, www.issfal.org.uk) , and the International Society for Research in Human Milk and Lactation (ISRHML, www.isrhml.org.umu.se).

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## RESULTS

*ENERGY REQUIREMENTS OF PREGNANCY AND LACTATION*

***Pregnancy leads to a modest in crease in energy needs: I trimester→ +375kJ/day**
**II trimester→ +1200kJ/day**
**III trimester→ +1950kJ/day**
***Lactating well-nourished women need an increment of energy intake of 1.9MJ/day**
***No indications for a need to change total fat intakes (as % of energy intake).**

***n-3* *FATTY ACID INTAKE IN PREGNANCY AND LACTATION***

***Fetal DHA accretion is approximately 67 mg/day in the last trimester of pregnancy. Because of the scarce an not always efficient conversion of alpha-linolenic in DHA, and considering that about one-third of maternal dietary intake of preformed DHA is deposited in fetal brain, pregnant women should reach an average intake of at least 200mg DHA/day.**
***A milk DHA content of 0.2% of total fatty acids is desiderable for infants good-outcome, therefore an average dietary intake of 200mg DHA/day appears adequate also for lactating women.**
***n-3 LCPUFA supply during pregnancy: - prolongs gestation by an average 1.6 to 2.6 days,**
**- leads to a slight increase of birth-weight (47-54g),**
**- reduces the risk or early premature delivery (before 34 weeks) by 31% in all pregnancies, by 61% in high risk pregnancies.**
**- No serious adverse effects were detected up to the highest intake of 2.7g total n-3 LCPUFA/day.**
***A supplementation is not necessarily recommended: the desired average intake of at least 200mg DHA/day can be reached with the consumption of one to two portions of fish per week.**
***Fish can significantly contribute to dietary exposure of contaminants such as methyl-mercury, dioxins and polychlorinated biphenyl (PCB) that are toxic to the developing brain and may also adversely affect fetal growth. Tuna, marline, spike swordfish and shark, herring and salmon that contain high quantities of contaminants should be avoided.**

*ANTIOXIDANTS*

***Supplementing women with any antioxidants during pregnancy compared with control or placebo was associated with a 39% reduction in the risk of preeclampsia and 35% risk reduction of having a small for gestational age infant.**
***The currently available data do not provide a basis for recommending antioxidant intakes for pregnant and lactating women in excess of reference nutrient intakes.**

## CONCLUSIONS AND RECOMMENDATIONS:

1. **Dietary fat intake during pregnancy and lactation (as a proportion of energy intake) should be the same as that recommended for the general population.**

2. **The omega-3 long-chain polyunsaturated fatty acid (*n-3* LCPUFA), docosahexaenoic acid (DHA), must be deposited in adequate amounts in brain and other tissues during fetal and early postnatal life. Several studies have shown an association between maternal dietary intake of fatty fish or oils providing *n-3* LCPUFA during pregnancy and/or lactation and visual and cognitive development as well as other functional outcomes of the infants. Therefore, pregnant and lactating women should aim to achieve a dietary intake of *n-3* LCPUFA that supplies a DHA intake of at least 200 mg/day. Intakes of up to 1 g/day of DHA or 2.7 g/day of *n-3* LCPUFA have been used in randomized trials without occurrence of significant adverse effects.**

3. **Women of childbearing age should consume one to two portions of fish per week, including fatty fish which is a good source of *n-3* LCPUFA. This intake of fatty fish usually does not exceed the tolerable intake of environmental contaminants. Dietary fish should be selected from a wide range of species without undue preference for large predatory fish which are more likely to be contaminated with methyl-mercury.**

4. **Intake of the precursor, alpha-linolenic acid, is far less effective with respect to DHA deposition in fetal brain than the intake of preformed DHA.**

5. **There is no evidence that women of childbearing age whose dietary intake of linoleic acid is adequate need an additional dietary intake of Arachidonic acid.**

6. **Some studies have shown that maternal intake of fish, fish oils or *n-3* LCPUFA results in a slightly longer duration of gestation, a somewhat higher birth weight and a reduced risk of early preterm delivery. The clinical importance of such effects with respect to infant health has not been fully elucidated.**

7. **Screening for dietary inadequacies should be performed during pregnancy, preferably during the first trimester. If less than desirable dietary habits are detected, individual counselling should be offered during pregnancy as well as during lactation.**

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