Orthomol Natal®
Before - during - after pregnancy

DGE recommendations: additional 300 kcal per day from 4th month

Micronutrients: Recommended additional intake in pregnancy

Pregnant women with undersupply of vitamins

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin C</td>
<td>7%</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>1%</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>29%</td>
</tr>
<tr>
<td>Vitamin B1</td>
<td>38%</td>
</tr>
<tr>
<td>Vitamin B2</td>
<td>38%</td>
</tr>
<tr>
<td>Folic acid</td>
<td>96%</td>
</tr>
</tbody>
</table>


Focuses of interest

Wellbeing  Risk reduction  Development
Development of the child

Neural tube defects

- malformation of the spinal cord
- present in various manifestations
Folic acid

Functions
- Synthesis of purines and pyrimidines → cell growth and division, cell differentiation
- Conversion of the cytotoxic homocysteine

DGE recommendations
- Women (20 to 50 years) 400 µg daily
- Pregnant women 600 µg daily
- Breastfeeding mothers 600 µg daily

Folate deficiency and pregnancy
→ infertility
→ neural tube defects
→ abortions

Folic acid supplementation

Folic acid cereals (muesli) lowers neural tube defects

Conclusion:
Data from a period of 6 years prior and after the start of folate supplementation show in a sample of 336,000 Canadian women that after folate supplementation the prevalence of neural tube defects decreased from 1.13 to 0.58 per 1,000 deliveries, spina bifida were 58%, anencephalas 43% less frequent.
Reduction in Neural-Tube Defects after Folic Acid Fortification in Canada

In Kanada
Anreicherung von
Grundnahrungsmittel
seit 1998

N=2446

46% Reduktion von
Neuralrohrdefekten


Medical importance of dietary supplementation with folate

Summary
Medical importance of Dietary Supplementation with Folate

With current dietary habits the daily allowance of folic acid recommended for health prevention is not met in the majority of the German population. An adequate folic acid supply during early pregnancy has been shown to reduce the incidence of neural tube defects (currently about 1.5/1,000 pregnancies in Germany) by 70 to 75 per cent, and terminations of pregnancies following prenatal diagnosis of these congenital malformations could be reduced to a similar degree. Initiation of folic acid supplement use initiated after the diagnosis of pregnancy is usually too late to achieve effective neural tube defect prevention. A better and highly desirable alternative is folic acid supplementation of staple diet. This is also expected to give rise to further benefits in the population at large, in particular a reduction of cardiovascular disease mortality and mortality.

Key words: folate therapy, dementia, cleft lip, cleft palate, prevention, homocystein metabolism, pregnancy

Deutsches Ärzteblatt | Jg. 101 | Heft 34 | 4. Juni 2004

"Every 10th newborn has iodine deficiency"

There is still a suboptimal iodine supply in all age groups in Germany. Depending on age group and region, 5% to 10% of the population has an enlargement of the thyroid gland.

Especially, in 10% of all newborns there is a iodine deficiency together with impaired thyroid hormone production.
Iodine

Functions
- Component of thyroid hormones
- Maturation and development of the nervous system

DGE recommendations
- Pregnant women 230 µg daily
- Breastfeeding mothers 260 µg daily

Situation
- Actual intake: 70-110 µg daily
- Germany: moderate iodine deficiency (according to WHO)
- Approx. 40% of Germans have thyroid enlargement (BgVV 2001)
- Annual costs for diagnosis and therapy of iodine-deficiency diseases: 1 billion EURO (BgVV 2001)

Iodine deficiency and the thyroid gland

The supplementation of iodine tablets is a useful way for the optimal supply before pregnancy in order to fill the body's iodine reservoirs. This is also true for women who are treated with thyroid hormones.

The daily intake of 100 (to 150) µg of iodine as tablet is considered sufficient.
Iron

Functions

• component of hemoglobin
  → oxygen transport
• component of enzymes

DGE recommendations

• women from 10 to <51 yrs: 15 mg daily
• pregnant women: 30 mg daily
• breastfeeding mothers: 20 mg daily

"The real intake in women is, however, with approx. 11 mg per day below the recommendations."
Interpretation:
Maternal vitamin D insufficiency is common during pregnancy and is associated with reduced bone-mineral accrual in the offspring during childhood; this association is mediated partly through the concentration of umbilical venous calcium. Vitamin D supplementation of pregnant women, especially during winter months, could lead to long-lasting reductions in the risk of osteoporotic fracture in their offspring.

Lancet 2006; 367: 36–43
Vitamin D in pregnancy and lactation: maternal, fetal, and neonatal outcomes from human and animal studies

VITAMIN D IN PREGNANCY AND LACTATION

NORMAL
CALCIUM INTAKE
SERUM Ca²⁺
URINE

PREGNANCY
CALCIUM INTAKE
SERUM Ca²⁺
URINE

LACTATION
CALCIUM INTAKE
SERUM Ca²⁺
URINE

FIGURE 1: Schematic diagram illustrating calcium homostasis in normal pregnancy and lactation compared with normal. Arrow thickness indicates a reduced calcium or increase in urinary excretion in the normal, nonpregnant state. Adapted from reference 2, copyright 1997. The Endocrine Society.

Kovacs CS. Am J Clin Nutr 2008;88(2):520-528

Nutritional vitamin D status during pregnancy: reasons for concern
Bruce W. Hollis, Carol L. Wagner

Fig. 2. The endocrine, paracrine and autocrine functions of vitamin D. Vitamin D is converted in the liver to 25(OH)D, which enters the systemic circulation and is converted to 1,25(OH)₂D in a variety of end organs tissues. As shown, 1,25(OH)₂D is involved in the regulation of numerous systems.
Maternal intake of vitamin D during pregnancy and risk of recurrent wheeze in children at 3 y of age


Orthomol Natal® – comprehensive supply

Orthomol Natal® − comprehensive supply

Omega-3 Fatty Acids
**Lipids**

![Diagram of lipids in a membrane]

- Membrane building-blocks
- Regulatory functions


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**Long-chain polyunsaturated fatty acids**

Influence of long-chain PUFA on problem-solving by children (10-month-olds)

<table>
<thead>
<tr>
<th></th>
<th>Supplementation of long-chain fatty acids</th>
<th>No supplementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention Scores</td>
<td>14.0</td>
<td>11.5</td>
</tr>
<tr>
<td>Intentional Solutions</td>
<td>2.0</td>
<td>0</td>
</tr>
</tbody>
</table>

Role of omega-3 polyunsaturated fatty acids in pregnancy: need for increasing awareness among women

The recommendations are to consume 200mg DHA per day which can be obtained by consuming two fatty fish meals per week. Pregnant women have limited knowledge about n-3 PUFA and they need to be educated about the importance of DHA consumption during pregnancy.

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Omega Fatty Acids DHA and AA Take Center Stage at Asian Conference on Pediatric Nutrition

BEIJING, October 19, 2007/PRNewswire/ --

Research being presented this week at the Third Asian Congress on Pediatric Nutrition in Beijing, China, provides strong support for fatty acid intake during pregnancy, infancy and early childhood. Of particular focus are the omega-3 fatty acid, docosahexaenoic acid (DHA), a major structural fat in the brain and retina of the eye, and the omega-6 fatty acid arachidonic acid (AA), which is abundant in the brain and needed for growth and immunity.

Berthold Koletzko, M.D., Dr. von Hauner Children's Hospital, University of Munich, will present new Perinatal Lipid Nutrition Group (PeriLip) recommendations stating that pregnant and nursing women should consume at least 200 mg of DHA every day. This expert committee found that women with higher DHA omega-3 intakes had healthier pregnancies, including higher birth weights and fewer premature births. DHA intake was also linked with improved infant outcomes, such as enhanced brain and eye development.
Essential fatty acids: Docosahexaenoic acid (DHA)

News from ACS

FOR IMMEDIATE RELEASE: 9 April 2002

Contact: Charmaine Marsh
creams@acs.org
(301) 622-3440 / (800) 527-8027
American Chemical Society

Fatty acid could offset postpartum depression and improve babies’ development

ORLANDO, Fla., April 8 — Pregnant or nursing women may be able to reduce their chances of developing postpartum depression by increasing their consumption of the essential fatty acid DHA, according to David Kyle, Ph.D., the U.S. director of the Mother and Child Foundation. DHA (docosahexaenoic acid) is an omega-3 fatty acid mostly found in fishlike tuna and salmon and in algae.

Approximately 15-20 percent of women who give birth in the United States develop postpartum depression, according to Kyle, who spoke today at the 223rd national meeting of the American Chemical Society, the world’s largest scientific society. “We believe that the high incidence of postpartum depression in the United States may be triggered by a low dietary intake of DHA,” he said.

Orthomol Natal® – comprehensive supply

Orthomol Natal® offers a comprehensive supply of nutrients essential for maternal and fetal health. This includes:

- Iodine
- Calcium, Vitamin K
- Magnesium
- Folic Acid
- Iron
- Antioxidants (vitamins C and E, zinc, selenium)
- Other B-Vitamins
- Omega-3 Fatty Acids
- Vitamin D
- Probiotics

Each Orthomol Natal® capsule is designed to promote well-being throughout pregnancy and beyond.
Probiotics

Probiotics are defined as "living microorganisms which upon digestion in their active form in certain number, exert health benefits".

Possible effects of probiotics in pregnancy

- Strengthening of defences
- Prevention of allergic diseases
  - Regulation of intestinal functions
  - Influence on urogenital infections
Atopic dermatitis

Risk of atopy in neonatals

<table>
<thead>
<tr>
<th>Situation</th>
<th>Probability</th>
</tr>
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<tbody>
<tr>
<td>No parent has atopy</td>
<td>5-15 %</td>
</tr>
<tr>
<td>One parent has atopy</td>
<td>20-40 %</td>
</tr>
<tr>
<td>One sibling has atopy</td>
<td>25-35 %</td>
</tr>
<tr>
<td>Both parents have an atopy</td>
<td>40-60 %</td>
</tr>
<tr>
<td>Both parents have atopies of the same manifestation</td>
<td>60-80 %</td>
</tr>
</tbody>
</table>

www.dha-allergien-vorbeugen.de/html/allergierisiko.html
Atopic dermatitis and skin disease

Meta-analysis of clinical trials of probiotics for prevention and treatment of pediatric atopic dermatitis

Joohae Lee, AB, David Seto, BA, and Leonard Bisloro, MD
Newark, NJ

Peri- and postnatal supplementation of probiotics reduces the risk of atopic disease in children

J Allergy Clin Immunol 2008;121:116-21
Peri- and Postnatal Supplementation of Probiotics and Development of Atopic Eczema in Children after 2 and 4 Years


Risk reduction

<table>
<thead>
<tr>
<th></th>
<th>after 2 years</th>
<th>after 4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placebo</td>
<td>50%</td>
<td>43%</td>
</tr>
<tr>
<td>Probiotics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Orthomol Natal® – synergies

- Iodine
- Calcium, Vitamin K
- Magnesium
- Folic Acid
- Iron
- Antioxidants (Vitamins C and E, zinc, selenium)
- Other B-Vitamins
- Probiotics
- Omega-3 Fatty Acids (especially DHA)
- Vitamin D
Immune modulation by omega-3 fatty acids and probiotics

- Adhesion of probiotics
- Synergies of omega-3 fatty acids and probiotics
- Secretion of anti-inflammatory transmitters
- Immune-modulation

Useful measure during pregnancy and lactation

- Avoid early feeding with cow milk and highly allergenic foods, e.g. nuts
- Avoid dust mite exposure
- Breastfeeding during first 4 months
- Probiotic supplementation in pregnancy and lactation
- No smoking and smoke-free environment
- Antioxidant- and omega-3 fatty acid-rich diet

Important micronutrients in pregnancy

For functioning of the immune system:
vitamin C, vitamin C, beta-carotene, zinc and selenium

For the support of the thyroid gland and metabolism:
iodine

For the skeletal development:
calcium, vitamin D, vitamin K

For the promotion of cell growth and optimum development:
folic acid and vitamin $B_{12}$

For the support of metabolic functions:
B-vitamins ($\rightarrow$ carbohydrate, fat, protein metabolism)

For blood formation:
folic acid, vitamin $B_{12}$ and iron

Key facts – Orthomol Natal®

Probiotics:
- strengthening the immune system
- regulating bowel function
- Studies in the U.S. by Reid et al. confirm that the oral intake of probiotics significantly contributes to improving vaginal flora

Omega-3 fatty acids (DHA):
- supporting the attachment of probiotics to the intestinal mucous membrane
- enhancing modulation of the immune system

Vitamin D3:
- needed by the immune system
- to support bone metabolism
## Composition – Orthomol Natal®

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>per daily serving</th>
<th>% RDA**</th>
<th>per 100 g</th>
<th>% RDA**</th>
<th>per 100 g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin C</td>
<td>170 mg</td>
<td>180</td>
<td>7.5 mg</td>
<td>39.3</td>
<td></td>
</tr>
<tr>
<td>Vitamin D</td>
<td>3.0 mcg</td>
<td>500</td>
<td>27.6 mcg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B3</td>
<td>2.2 mg</td>
<td>250</td>
<td>22.7 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B5</td>
<td>26.0 mcg</td>
<td>500</td>
<td>22.7 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>1.7 mg</td>
<td>150</td>
<td>16.9 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>0.4 mcg</td>
<td>100</td>
<td>3.4 mcg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Folic Acid</td>
<td>155 mcg</td>
<td>500</td>
<td>31.0 mcg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niacinamide</td>
<td>5.0 mg</td>
<td>100</td>
<td>9.0 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minerals, Trace Elements and Other Micronutrients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>486 mg</td>
<td>150</td>
<td>35.9 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td>180 mg</td>
<td>60</td>
<td>12.7 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>4.0 mg</td>
<td>60</td>
<td>104.1 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td>3.0 mg</td>
<td>45</td>
<td>52.0 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td>0.5 mg</td>
<td>30</td>
<td>6.7 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iodine</td>
<td>0.2 mg</td>
<td>10</td>
<td>15.1 mcg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selenium</td>
<td>0.1 mg</td>
<td>100</td>
<td>13.5 mcg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lutein</td>
<td>150 mcg</td>
<td>100</td>
<td>390.4 mcg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lutein + Zeaxanthin</td>
<td>3.5 mg</td>
<td>100</td>
<td>11.6 mcg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essential Fatty Acids</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish Oil, including EPA and DHA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omega-3 Fatty Acids, of which EPA + DHA</td>
<td>430 mg</td>
<td>75</td>
<td>3.7 g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Fatty Acids (ALA, GLA)</td>
<td>380 mg</td>
<td>75</td>
<td>3.7 g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Fatty Acids (GLA, EPA)</td>
<td>50 mcg</td>
<td>1000</td>
<td>23.1 mcg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** = EU Recommended Daily Allowance
*** = 25% Recommended Daily Allowance

* Energy: 2.9 kJ (0.7 kcal), 1.45 kJ (0.35 kcal)

** = EU Recommended Daily Allowance

* = Total Amount per 100 g

### Ingredients

- Lactic Acid Bacteria Cultures, including: Probiotics: *Lactobacillus acidophilus*, *Lactobacillus plantarum*, *Streptococcus thermophilus*, *Bifidobacterium bifidum*

### Orthomol Natal®

... always!!
The NIH (National Institute of Health) recommends for periods of growth as well as for women after menopause 1,500 mg calcium per day. Currently researchers believe that the optimal calcium intake in all phases of life, but especially till the age of 35, positively influences the calcium balance, and thus acts as an approach for osteoporosis prevention.

**Calcium**

**Functions**
- mineralisation of bones and teeth
- second messenger
- electromechanical coupling

**Skeletal calcium content**
- Male adult: >1,000 g
- Female adult: approx. 800 g
- Newborn: approx. 30 g

**DGE recommendations**
- from the age of 19 yrs: 1,000 mg daily
- pregnant women: 1,000 mg daily
- breastfeeding mothers: 1,000 mg daily
Magnesium

Functions
- Co-factor of almost 300 enzymes
- Influence on Ca2+ influx, K+ channels

Therapeutic effect
- Influence on cramps in the calf
- Tocolysis

DGE recommendations
- In general: 300 mg daily
- Pregnant women: 310 mg daily
- Breastfeeding mothers: 310 mg daily

"... during pregnancy, there is not additional requirement. However, considering the symptoms of deficiency, in particular in pregnant women, this statement is debatable."

Orthomol Natal® – well-supplied during pregnancy and breastfeeding
• lebenswichtige Vitamine, Mineralien, Spurenelemente, Fettsäuren und Probiotika
• speziell zusammengesetzt für die Schwangerschaft
• auf orthomolekularer Basis: ausreichend hochdosiert - ausgewogen kombiniert
• zur Nahrungsergänzung vor und während Schwangerschaft und Stillzeit
• zur Förderung der körperlichen und geistigen Entwicklung des Kindes im Mutterleib
• für das Wohlbefinden der Mutter in der Schwangerschaft