• in Germany, almost all pregnant women show folic acid deficiency
• folic acid deficiency increases the risk of neural tube defects
• supplementation with 5 mg folic acid reduces the risk of a neural tube defect by approx. 85%
• recommended for a number of risk groups
Supplementation with 5 mg folic acid reduces the risk of a neural tube defect by approx. 85%.
# Table of contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>FOLIC ACID biosyn</td>
</tr>
<tr>
<td>4</td>
<td>Folic acid – a vital vitamin</td>
</tr>
<tr>
<td>5</td>
<td>Almost all pregnant women in Germany show a folic acid deficiency</td>
</tr>
<tr>
<td>6</td>
<td>Folic acid deficiency increases the risk of neural tube defects</td>
</tr>
<tr>
<td>8</td>
<td>For whom are 5mg folic acid per day recommended?</td>
</tr>
<tr>
<td>9</td>
<td>Over which time period are 5mg folic acid per day recommended?</td>
</tr>
<tr>
<td>10</td>
<td>Is there a risk of pernicious anemia with a high-dose folic acid supplementation?</td>
</tr>
<tr>
<td>11</td>
<td>Attachment</td>
</tr>
<tr>
<td>11</td>
<td>Bibliography</td>
</tr>
<tr>
<td>13</td>
<td>Information on biosyn Arzneimittel GmbH</td>
</tr>
<tr>
<td>16</td>
<td>Imprint</td>
</tr>
</tbody>
</table>
Folic acid – a vital vitamin

Folic acid (pteroylglutamic acid – PteGlu₁) belongs to the group of B vitamins. Without folic acid, the living cell cannot divide.

In the human organism, this substance is reduced to tetrahydrofolic acid (H₄PteGlu₁), which acts in the intermediary metabolism as co-enzyme for transfer reactions of one-carbon units such as methyl, formyl, hydro-xymethyl, methenyl, methylene and formimino groups.
Almost all pregnant women in Germany show a folic acid deficiency

The daily folic acid requirements for women are about 300 µg (German Society for Nutrition [DGE]). An examination of 1,341 women in the scope of the Baby-Care program of the statutory health insurance providers showed that 74% of the women had a daily folic acid intake which was less than 70% of the requirement (<210µg/day).\(^1\) 34% of the women did not even reach 50% of the recommended daily quantity (<150µg/day).\(^1\)

For pregnant women, the daily folic acid requirements increases to 550 µg (DGE). 21,433 pregnant women in the Baby-Care program were examined for their folic acid status.\(^1\) The resulting value of 94% for the pregnant women is below 385 µg folic acid per day (70% of the requirements).\(^1\) Also half of the recommended daily requirement of folic acid is not achieved by 70% of pregnant women (Fig. 1).\(^1\)

**Folic acid deficiency for pregnant women in Germany is increased (Baby Care Program)**

![Chart showing folic acid deficiency among pregnant women](image)

*Created based on: FB+E Forschung, Beratung + Evaluation GmbH in Medizin, Epidemiologie, Gesundheits- und Sozialwesen, Neuer Report im Spiegel (03/2012) zu Vitaminen und Mineralstoffen darf Schwangere nicht verunsichern.*

*Fig. 1*
Folic acid deficiency increases the risk of neural tube defects

Neural tube defects are an important reason for the mortality of newborns. Approximately 0.5–8 babies per 1,000 births are affected. Worldwide about 300,000 newborns have neural tube defects.\(^2\)

The risk of a neural tube defect increases at a folic acid concentration below 700 nmol/l in the red blood corpuscles by threefold compared to values above 900 nmol/l.\(^3\) The folic acid concentration of 900 nmol/l in the red blood corpuscles is regarded as an optimal value to minimize the risk of neural tube defects.

Already since the 1960s, epidemiological studies have shown that folic acid supplementation reduces the risk of a neural tube defect.\(^2\)

The German guideline recommends a supplementation with 400 µg folic acid per day for women who are pregnant or desire to be.\(^4\)

However, a Canadian study has shown that despite enrichment of foods with folic acid and supplementation with prenatal multivitamins, 40 % of the women did not attain the optimal folic acid concentration of 900 nmol/l in red blood corpuscles.\(^3\)

400 µg folic acid per day additionally reduces the risk of a neural tube defect by about 36 %.\(^3\) An increase of the supplementation to 5 mg per day even reduces the risk by approx. 85 % (Fig. 2).\(^3\)
Folic acid reduces the risk of a neural tube defect


Fig. 2
For whom is 5 mg folic acid per day recommended?

A supplementation with 5 mg per day is recommended i.e. in the following cases for pregnant women or women desiring to become pregnant (Fig. 3):[5]

- Women with
  - neural tube defects in the family or in earlier pregnancies
  - specific genotypes associated with an increased risk of neural tube defects
  - disorders with resorption problems (e.g. Morbus Crohn)
  - adiposity with a BMI > 35 kg/m²
  - diabetes
  - inadequate compliance (therapy loyalty)
  - problematic lifestyle (smoking, alcohol, drugs)

- Women who need to take anti-epileptic medications or folic acid antagonists (methotrexate, sulfonamides) and who cannot switch to another therapy

Over which time period are 5 mg folic acid per day recommended?

A supplementation with 5 mg folic acid per day is recommended two months before conception up to the end of the first trimester (Fig. 4). The neural tube develops in humans between the 19th and 28th day of pregnancy. Folic acid supplementation is therefore particularly important in the first stage of pregnancy.

**Dosage recommendation for folic acid during the pregnancy**

- **Previously**: 0 mg
- **Two months before conception**: 1 mg
- **End of the 12th week**: 2 mg
- **Remaining pregnancy**: 5 mg

Created based on:

*Fig. 4*
Is there a risk of pernicious anemia with a high-dose folic acid supplementation?

It was previously recommended that a vitamin B\textsubscript{12} deficiency is excluded before the intake of high-dose folic acid, since pernicious anemia could be masked by folic acid supplementation. However, studies could not demonstrate this.\cite{6}

Therefore, according to the recommendation of the latest Canadian guideline of 2015, it is not necessary to test for a vitamin B\textsubscript{12} deficiency before starting folic acid supplementation.\cite{6}

It remains to be seen whether this recommendation will also prevail in Germany.
Bibliography


**FOLIC ACID biosyn, 5 mg per tablet**

**Indications**: Folic acid deficiency that cannot be offset from food sources.

**Composition**: 1 tablet contains 5.0 mg folic acid. Excipients: Lactose monohydrate, talc, cellulose powder, colloidal anhydrous silica, magnesium stearate (Ph. Eur.).

**Contra-indications**: In case of megaloblastic anemia it must be ensured that it is not caused by vitamin B\textsubscript{12} deficiency, as otherwise irreversible neurological disorders may occur.

**Side effects**: In isolated cases, allergic reactions with e.g. erythema, itching, difficult breathing, nausea or anaphylactic shock. After high-dose administration rarely gastrointestinal disorders, sleep disturbance, excitation or depressions.

**Form of administration, size of packages**: 50 tablets (N2). Subject to sale in pharmacies.
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World market leader for high-dose selenium injections

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FOLIC ACID biosyn

high-dose 5 mg preparation

biosyn Arzneimittel GmbH
Schorndorfer Straße 32
70734 Fellbach
Germany

information@biosyn.de
www.biosynpharma.com
www.biosyncorp.com
www.biosyn.de

More information about us on our Facebook page

Managing Director: Dr. Thomas Stiefel and Ortwin Kottwitz
Commercial Register: County Court Stuttgart HRB 262712
Place of performance: Fellbach, Legal venue Stuttgart