

Folic acid fortification and supplementation in Switzerland

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Abbreviations

- FOPH Federal Office of Public Health (Bundesamt für Gesundheit)
- FCN Federal Commission of Nutrition (Eidgenössische Ernährungskommission)
- SSP Swiss Society of Paediatrics (Schweiz. Gesellschaft für Paediatric)
- ISPM Institute for Social- and Preventive Medicine
- FA Folic acid
- ECFA Erythrocyte folic acid
- NTD Neural tube defect

History of actions on folic acid for prevention of neural tube defects (NTD) in Switzerland 1

- 1992 first discussion about folic acid and NTD prevention in the FCN and first paper about this topic by the president of the FCN (Prof.O.Tönz)
- 1994 FOPH and SSP organize the first colloquium on folic acid
- 1995 first recommendation of the FCN to fortify foods with folic acid
- 1996 Recommendations for the prevention of NTD by supplementantion of folic acid in the preconceptional phase and during pregnancy
- 1997 A mill in the western part of Switzerland fortifies flour with 140µg/100g flour and from spring 1999 on with 280µg/100g

History of actions on folic acid for prevention of neural tube defects (NTD)in Switzerland 2

- 1997 one parliamentarian and several co-subscribers submitted a postulate on the prevention of NTD by mandatory fortification of foods, especially flour with folic acid
- 1999 this postulate is accepted by the government. The FOPH starts a more intensive activity on folic acid by asking the ISPM Zürich to work on this topic, which leads to several review papers (see below)
- 2000 (Sept) the FOPH asks the FCN to appoint a working group on folic acid to propose measures how the supply of folic acid could be improved for the Swiss population and how NTD can be prevented

History of actions on folic acid for prevention of neural tube defects (NTD) in Switzerland 3

- 2000 on private basis the "Folic Acid Offensive" is founded to improve the supply of folic acid by the addition of folate rich wheat germs (viogerm) and synthetic folic acid to some foods and by enhancing the information about FA (www.folsäure.ch)
- 2002 The report of the working group is discussed and accepted by the FCN and is published in the same year
(www.bag.admin.ch/themen/ernaehrung/00211/03529/03531/index.html?lang=de)
- 2002 a jurist is asked for an expertise, if a mandatory fortification of foods is to be legally allowed. The report is available since 2006 (Nov) and can be seen under the same web address as above.

Swiss papers on folic acid, which served the working group as basis for their judgement

(most papers in German)

1

- Vitamins and pregnancy – prevention of NTD with folic acid. O. Tönz, Schweiz Aerzte Z 1992;73:1472-75
- Folic acid for the primary prevention of NTD
 - O.Tönz, J Lüthy, Schweiz Aerzte Z 1996;77:569-73
 - O Tönz, J Lüthy, O Raunhardt Schweiz Med Woschr 1996;126:177-87
- Folic acid prevention, not only for the NTD
O Tönz Monatsschr Kinderheilkde 1999;147:320-26
- Folic acid and prevention of spina bifida. How is the scientific evidence implemented in various countries (engl.) L Kötter-Spirig, 1999, ETH Zürich

Swiss papers on folic acid, which served the working group as basis for their judgement

(most papers in German)

2

- Folic acid in the prevention of spina bifida. How can the scientific knowledge be transposed by supplements. J Hurst, 2000, ETH Zürich
- High preventive potential of folic acid
O Tönz Zschr Ganzheitsmed 2001;13:8-12
- The role of folate, antioxidant vitamins and other constituents in fruit and vegetables in the prevention of cardiovascular disease – the epidemiological evidence M Eichholzer et al. Int J Vitam Nutr Res 2001;71:5-11
- Folate and the risk of colorectal, breast and cervix cancer: the epidemiological evidence
M Eichholzer et al. Swiss Med Wkly 2001;131:539-49

Swiss papers on folic acid, which served the working group as basis for their judgement

(most papers in German)

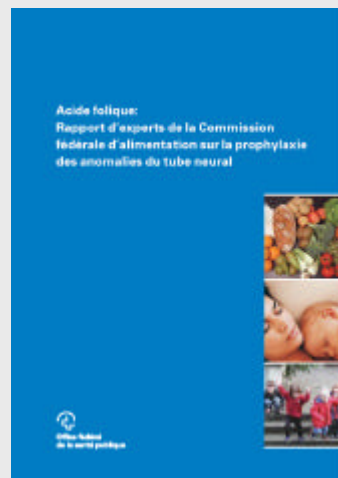
3

- Interventional strategies for the prevention of NTD M Eichholzer, 2001 not published, for the FOH
- Folic acid: Aspects of security for the whole population M Eichholzer et al. Schweiz Rundsch Med Prax 2002;91:7-16
- Prevention of spina bifida: should flour also be fortified with vitamin B12 and B6 ? M Eichholzer et al. Schweiz Z GanzheitsMedizin, 2002;14:64-74
- About meaning and goal of a general prevention of folic acid O Tönz, Schweiz Med Forum 2002;2:303-10

1996: Recommendations for primary and secondary prevention of NTD

- All women who would like to or could be pregnant, i.e. all women of child bearing age without safe contraception should consume a folate rich diet (fresh fruits and vegetables, whole grain products and fortified food, e.g. cereals and breakfast beverages) and
- In addition they should take a supplement of 0.4 mg folic acid (with or without other vitamins) daily from 4 weeks before conception until 12 weeks after
- Women who have had a previous pregnancy affected by NTD are advised to take periconceptionally a supplement of 4 - 5 mg folic acid daily.

Report of the working group on the prevention of NTD with folic acid



Data of the supply of FA in Switzerland

Official food supply data (supply = production ± changes of stock – export + import per person of population, losses not included)

	1985/87	1994/95	requir.
Total folate (µg/day/person)	274	305	(400)

1987: 34% of recruits and 17% of foreign workers had a high risk for deficient supply, regional differences, rural regions better

1997: school children in different cantons reached 70% of recommended dose only with FA enriched foods

1999: 70-75 y old persons, 20% of women and 30-40% of men with suboptimal folate and B12 values

2001: children and youth of canton Waadt consumed only 30% of the recommended dose

25 – 35 y old women had a folate intake of 127µg (±36)/day

Data on NTD in Switzerland

Incidence of NTD

Year	Prenatal ³	Total pos. ⁴ cases	Postnatal	Total pos. ⁴ cases
1998 ¹			12	
1999 ¹			14	
2000 ¹			17	
2001 ²	25	} 72	14	} 57
2002 ²	11		13	
2003 ²	15		15	
2004 ²	20		8	
2005 ²	20		18	

1 reported by the 7 Swiss departments of pediatric surgery

2 reported by the Swiss Pediatric Surveillance Unit

3 reported by 4 US-Centres, uncovering 59% of the Swiss population

4 double reporting excluded

Recommended measures to increase the FA supply of the Swiss population and for the prevention of NTD

- Fortification of baking flour (according to LMV Art.135 and 136) with 3mg FA and 10µg Vitamin B12 / kg flour on a mandatory basis.
This would give an additional daily supply of 275µg FA and 1µg B12 per person
- It has to be reflected upon the uncontrolled addition of FA to other foods in the near future
- The necessary legal foundations have to be introduced
- The Swiss population has to be informed about the scheduled measures
- The necessary basics have to be elaborated to accompany the fortification of meal by an expert group
- The hitherto recommendations have still to be propagated until the fortification can be introduced. Thereafter they have to be revised

Fortification with Vitamin B12

- Vitamin B12 has an independent prophylactic effect for NTD
- It lowers serum homocystein (Hcy)
- In the situation of a high supply of FA vitamin B12 is a limiting factor in the Hcy-metabolism
- The addition of B12 can prevent a deficiency of B12 in the older population, however it cannot prevent perniciosa

Possibilities of meal fortification with FA

amount

- General fortification of meal (without durum wheat) 140g / person /day
- Hard durum wheat for pasta 10kg/person/year
30% imported (Italy)
70% own-dry pasta
identical to 18.5g d.w./d
- Bread-meal 90g / person/ day

Folic acid fortification

Tönz 2002

- **70µg / 100g flour** = **65µg FA/d**
NAS/NRC 1974
Proposed fortification policy for Cereal grain products. „Replacement of losses“ without NTD prophylaxis
- **140µg / 100g flour** = **125µg FA/d**
FDA 1993, in USA and Canada since 1998
ECFA ~350µg/l ? 20-25% NTD prevention
- **300µg / 100g flour** = **275µg FA/d**
legal possibility in Switzerland
ECFA ~450µg/l ? 40-45% NTD prev.
- **350µg / 100g flour** = **320µg FA/d**
CDC 1994
ECFA ~500µg/l ? 45-50% NTD prev.

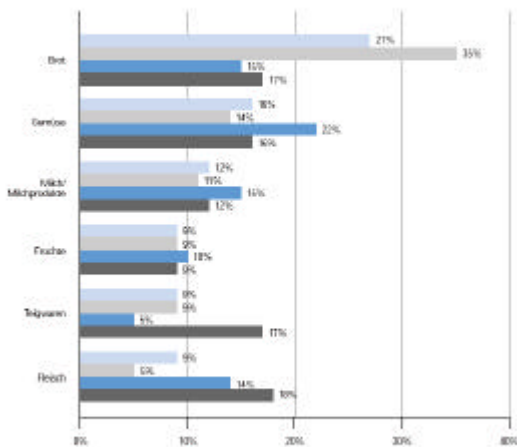
Data for the calculation of the additional supply of folic acid

- Sale of flour/person/year 51kg = 140g /day
 - of this: 60-65% as bread or bread similar pastry
 - the rest: Pizza, biscuits, cakes, cereals
- Sale of bread/pers/y 50kg = 135g/day
 - identical to 90g flour
- Losses
 - FA by preparation (baking loss) 12%
 - loss of flour/bread (estimated) 13%
 - (production, sale, consumption)
 - Bio-bread 10%

Abbildung 5

Das «wichtigste» Grundnahrungsmittel

Insgesamt unterschrieben
Häufigste Nennungen bei der Frage nach dem wichtigsten Grundnahrungsmittel



Daten: Zahlen im Klammern

■ Tessin (TO) ■ Graubünden (GR)
■ Valais (VS) ■ Ticino (TI)

Quelle: Birk-Mentor, Schweiz 2010

Further Proceedings

- To improve the knowledge about the actual consumption of food-folates and FA enriched foods or FA-supplements
- Measurement of FA-status in different healthy population groups and risk groups (EFA and Hcy)
- To get more knowledge on the consumption of different basic foods, especially bread and bakery to make better assumptions on the FA supply with fortified basic foods

Discussion of security aspects

- FA in the presence of vit.B12 deficiency
- Influence of FA on intake of zinc
- FA and antiepileptica
- FA and FA-antagonists like methotrexat
- Oversensibility to FA
- FA and increased rate of twin-births

2002/2003: Survey of FA supply during pregnancy in 500 women in the Eastern part of Switzerland

	West.Europ.	East. Non EU
• Knowledge about importance of FA	80%	60%
preventive effect	95%	65%
correct intake	90%	30-50%
• Source of information: 1. Media 2. Physicians		
• actual pregnancy: information about nutrition	60%	60%
" FA intake	70%	38%
" FA and NTD	70%	25%
1/3 no information		
• FA supplement in pregnancy		97.5%
multivitamin product		57%
at correct time		37%
• planned pregnancy , (< 25 years)	80%	(53%)
• planned pregnancy and correct intake of FA	46%	
• observation of foods rich in vitamins	70%	
• knowingly vitamin enriched products	50%	
• daily bread intake	80%	
• folate status at delivery, upper level or above, (to low)	75%	(0.8%)

Summary: Despite high intake of FA (97.5%), correct intake only in 37%. Especially young persons and immigrants need more information



**Stiftung
Folsäure Offensive Schweiz**

Foundation „Folic acid Offensive“
Switzerland



SFO+

Object

The foundation will perform preventive medical informations and campaigns , especially

- about the knowledge on FA and its effect on the human body and
- to sensibilize the population about the consequences of FA-deficiency

SFO+

Aims

The SFO+ aims to close the gap in the FA-supply in cooperation with

- leading food producers
- the commerce and
- expert groups

SFO+: recommendations of FA supplementation

- well balanced nutrition with natural foods
- Support of the recommended fortification of flour with FA
- Solutions for FA supplementation of food products
 - step 1 : foods with folate from wheat germs (Viogerm)
 - step 2 : Viogerm and FA
 - step 3 : FA

Activities of SFO+

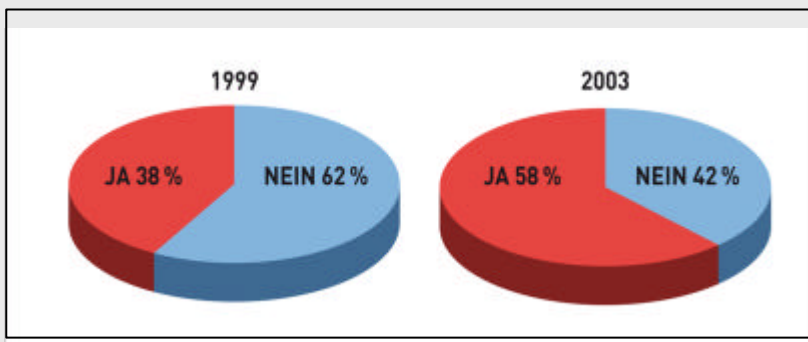
- Info booklets Edition about 600'000 (G/F)
- Newsletter 4 x /year
- Cooperation Physicians, midwives
Pharmacists, dietitians
- Media-Sendouts 2 x /year
- Homepage www.folsaeure.ch
www.folsaeuremed.ch

Events of SFO+

- ski- or day walking-day Support for children with NTD
- FA: the vitamin for life Health advising book with guide to FA
- General meeting 1 x /year
- Medical infoline By medical advisers
- Presentations At different meetings
- Education Co-worker motivation



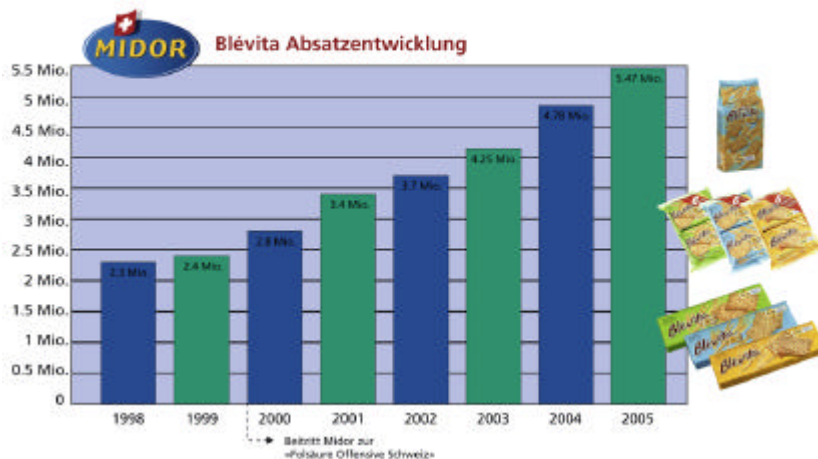
Did you already hear about the term folic acid?



Partner SFO



Positive Absatzzahlen



Excerpts from the legal opinion

- Mandatory fortification with folic acid is an enforced medication
- The terms “mandatory or enforced fortification“ are not known in the Swiss law, neither in the US or EU law. US government favors an enrichment with products designated „enriched“. In addition there are products without enrichment, which give the consumer the right of selfdetermination
- Mandatory fortification should therefore have a separate legitimation in the Swiss law, so far there is no legal basis
- The cantons are responsible for health regulation
- The food legislation offers also no basis for a mandatory fortification
- There are problems with the commensurability and compability of the base law
- The evidence of fortification is only given for NTD
- An enforced fortification would hit the whole population
- A possible way for CH could be a voluntary enrichment within the legal possibility and to allow a special health claim

Conclusions

- **In Switzerland ~70 children are expected to have NTD (estimated). The real incidence is about 0.5 – 0.8‰ (about 70'000 newborns / year)**
- **Since 1996, special recommendations by the FOPH do exist for pregnant women and young women, who like to be pregnant**
- **Since 2000, the SFO+ is active with enrichment of different foods with Viogerm and FA on a voluntary basis and also with information programs for the population**
- **2002: the report of the FCN working group recommends a mandatory fortification of flour with 3mg FA and 10µg B12 /kg flour**
- **2006: Expertise on legal possibilities of a mandatory fortification denies such a proceeding**
- **Finally, the incidence of NTB has not changed with all these measures**