

Gesundheitliche Bedeutung der Folsäurezufuhr¹

Teil 1: Folsäure und Gesundheit

Berthold Koletzko² und Klaus Pietrzik³ für den Arbeitskreis Folsäure und Gesundheit

²Dr. von Haunersches Kinderspital, Klinikum der Ludwig-Maximilians-Universität München;

³Institut für Ernährungswissenschaft Rheinische Friedrich-Wilhelms-Universität Bonn

Ernährungs-Umschau 51 (2004), S. 264 ff.

Literatur:

1. Akoglu B, Faust D, Milovic V, Stein J: Folate and chemoprevention of colorectal cancer: is 5-methyl-tetrahydrofolate an active antiproliferative agent in folate-treated colon cancer cells? Nutrition 17, 652-653, 2001
2. Alpert JE, Fava MF: Nutrition and depression: The role of folate. Nutr Reviews 55, 145-149, 1997
3. Baerlocher K, Eichholzer M, Lüthy J, Moser U, Tönnz O: Massnahmen zur Prophylaxe von Neuralrohr-Defekten und zur Verbesserung der Folsäure-Versorgung in der Schweiz. AG „Folsäure-Prophylaxe“ der Eidgenössischen Ernährungskommission. 2002
4. Bässler KH, Golly I, Loew D, Pietrzik K: Vitamin-Lexikon für Ärzte, Apotheker und Ernährungswissenschaftler. 3. Auflage. Verlag Urban & Fischer, München/Jena, 2002
5. Bazzano LA, He J, Ogden LG, Loria C, Vupputuri S, Myers L, Whelton PK: Dietary intake of folate and risk of stroke in US men and women. Stroke 33, 1183-1189, 2002
6. Beitz R, Mensink GBM, Fischer B, Thamm M: Vitamins – dietary intake and intake from dietary supplements in Germany. Europ J Clin Nutr 56, 539-545, 2002
7. Berry R, Li Z, Erickson J, Li S, Moore C, Wang H, Mulinare J, Zhao P, Wong L, Gindler J, Hong S, Correa A: Prevention of neural tube defects with folic acid in China. N Engl J Med 341, 1485-1490, 1999
8. Biasco G, Zannoni U, Paganelli GM, Santucci R, Gionchetti P, Rivolta G, Miniero R, Pironi L, Calabrese C, Di Febo G, Miglioli M: Folic acid supplementation and cell kinetics of rectal mucosa in patients with ulcerative colitis. Cancer Epidemiol Biomarkers Prev 7, 469-471, 1997
9. Botto LD, Khoury MJ, Mulinare J: Periconceptional use of vitamins and the prevention of conotruncal heart defects: evidence from a population-based case-control study. Pediatrics 98, 911-917, 1996
10. Boushey CJ, Beresford SAA, Omenn GS, Motulsky AG: A quantitative assessment of plasma homocysteine as a risk factor for vascular disease. Probable benefits of increasing folic acid intakes. JAMA 274, 1049-1057, 1995
11. Bower C, Stanley FJ: Dietary folate as a risk factor for neural tube defects: evidence from a case control study in Western Australia. Med J Aust 150, 613-619, 1989
12. Brönstrup A: Effects of single and combined B-vitamin supplementation on homocysteine concentrations in different population groups. Dissertation, Rheinische Friedrich-Wilhelms-Universität Bonn, 1998
13. Brönstrup A, Pietrzik K: Bedeutung von Homocystein bei der Entstehung von Atherosklerose – Ist eine Supplementierung von Vitaminen sinnvoll? Ernähr-Umschau 43, 80-87, 1996
14. Choi SW, Mason JB: Folate status: effects on pathways of colorectal carcinogenesis. J Nutr 132, 2413S-2418S, 2002
15. Clarke R: Large trials of folic acid supplementation for prevention of cardiovascular disease. J Inherit Metab Dis 26 (Suppl 1), 10, 2003
16. Clarke R, Frost C, Leroy V, Collins R: for the Homocysteine Lowering Trialists' Collaboration: Lowering blood homocysteine with folic acid based supplements: a meta-analysis of randomized trials. Brit Med J 316, 894-898, 1998
17. Czeizel AE: Controlled studies of multivitamin supplementation of pregnancy outcomes. In: Keen CL, Bendich A, Willhite CC (Hrsg.): Maternal nutrition and pregnancy outcomes. NY Acad Sci 678, 266-275, 1993
18. Czeizel AE: Folic acid in the prevention of neural tube defects. J Pediatr Gastroenterol Nutr 20, 4-16, 1995
19. Czeizel AE: Primary prevention of neural-tube defects and some other major congenital abnormalities: recommendations for the appropriate use of folic acid during pregnancy. Paediatr Drugs, 2, 437-449, 2000
20. Czeizel AE, Dudas I: Prevention of the first occurrence of neural-tube defects by periconceptional vitamin supplementation. N Engl J Med 327, 1832-1835, 1992
21. Czeizel AE, Dudás I, Météneki J: Pregnancy outcomes in a randomised controlled trial of periconceptional multivitamin supplementation. Final report. Arch Gynecol Obstet 255, 131-139, 1994
22. Daly LE, Kirke PN, Molloy A, Weir DG, Scott JM: Folate levels and neural tube defects. Implications for prevention. JAMA 274, 1698-1702, 1995
23. Den Heijer M, Koster T, Blom HJ, Bos GMJ, Briët E, Reitsma PH, Vandebroucke JP, Rosendaal FR: Hyperhomocysteinemia as a risk factor for deep-vein thrombosis. N Eng J Med 334, 759-762, 1996
24. Deutsche Alzheimer Gesellschaft e.V.: Epidemiologie der Demenz. Unter: <http://www.deutsche-alzheimer.de/pdf/Factsheet1.pdf>. Berlin, 2002. Zugang: März 2003
25. DGE (Deutsche Gesellschaft für Ernährung): Ernährungsbericht 1996. Frankfurt am Main, 1996
26. DGE (Deutsche Gesellschaft für Ernährung): Ernährungsbericht 2000. Frankfurt am Main, 2000
27. DGE (Deutsche Gesellschaft für Ernährung), Österreichische Gesellschaft für Ernährung, Schweizerische Gesellschaft für Ernährung, Schweizerische Vereinigung für Ernährung (Hrsg.): Referenzwerte für die Nährstoffzufuhr. Umschau Braus, Frankfurt am Main, 2000
28. Egen V, Hasford J: Prevention of neural tube defects: effect of an intervention aimed at implementing the official recommendations. Soz.-Präventivmed. 48, 24-32, 2003
29. Eichholzer M, Lüthy J, Moser U, Fowler B: Folate and the risk of colorectal, breast and cervix cancer: The epidemiological evidence. Swiss Med Wkly 131, 539-549, 2001
30. Ericson A, Kallen B, Aberg A: Use of multivitamins and folic acid in early pregnancy and multiple births in Sweden. Twin Res 4, 63-66, 2001
31. EVM (Expert Group on Vitamins and Minerals): Safe upper levels for vitamins and minerals. Draft for consultation. Unter: <http://www.food.gov.uk/science/ouradvisors/vitandmin/evreport>. Zugang: August 2002
32. Fava M, Borus JS, Alpert JE, Nierenberg AA, Rosenbaum JE, Bottiglieri T: Folate, vitamin B12, and homocysteine in major depressive disorders. Am J Psychiatry 154, 426-428, 1997
33. FDA (U.S. Food and Drug Administration): Study: no link between folic acid and twins. FDA Consum 37, 8, 2003 Mar-Apr
34. Food and Nutrition Board / Institute of Medicine: Dietary reference intakes for thiamin, riboflavin, niacin, vitamin B6, folate, vitamin B12, pantothenic acid, biotin, and choline. National Academy Press, Washington D.C., 2000
35. Frank A, Hagen M: Die Bedeutung der Folsäure bei der Prävention von Arteriosklerose und Neuralrohrdefekten. Aktuel Ernähr Med 25, 147-150, 2000
36. Gärtner J, Heinrich B, Lenard HG, von Kries R: Neuralrohrdefekte in Deutschland. Häufig-

- keit potentiell vermeidbarer Fälle. Kinderärztliche Praxis 1, 10-15, 1997
37. Genzel-Boroviczny O, Hachmeister A, von Kries R: Unverändertes Risiko für Neuralrohrdefekte. Mangelhafte Umsetzung der Empfehlungen zur Folsäureprophylaxe in der Frühschwangerschaft. Kinderärztliche Praxis 1, 6-9, 1997
38. Giovannucci E, Stampfer MJ, Colditz GA, Hunter DJ, Fuchs C, Rosner BA, Speizer FE, Willett WC: Multivitamin use, folate, and colon cancer in women in the Nurses' Health Study. Ann Intern Med 129, 517-524, 1998
39. Graham IM, Daly LE, Refsum HM, Robinson K et al.: Plasma homocysteine as a risk factor for vascular disease. The European Concerted Action Project. JAMA 277, 1775-1781, 1997
40. Hartridge T, Illing HM, Sandy JR: The role of folic acid in oral clefting. Brit J Orthodontics 26, 115-120, 1999
41. Hayes C, Werler MM, Willett WC, Mitchell AA: Case-control study of periconceptional folic acid supplementation and oral clefts. Am J Epidemiol 143, 1229-1234, 1996
42. Hernandez-Diaz S, Werler MM, Walker AM, Mitchell AA: Folic acid antagonists during pregnancy and the risk of birth defects. N Engl J Med 343, 1608-1614, 2000
43. Hernandez-Diaz S, Werler MM, Walker AM, Mitchell AA: Neural tube defects in relation to use of folic acid antagonists during pregnancy. Am J Epidemiol 153, 961-968, 2001
44. Hibbard ED, Smithells RW: Folic acid metabolism and human-embryopathy. Lancet 1, 1254, 1965
45. Hirsch S, de la Maza P, Barrera G, Gattas V, Pertermann M, Bunout D: The Chilean flour folic acid fortification program reduces serum homocysteine levels and masks vitamin B-12 deficiency in elderly people. J Nutr 132, 289-291, 2002
46. Homocysteine Lowering Trialists' Collaboration: Lowering blood homocysteine with folic acid based supplements: meta-analysis of randomised trials. BMJ 316, 894-898, 1998
47. Honein MA, Paulozzi LJ, Mathews TJ, Erickson JD, Wong LC: Impact of folic acid fortification of the US food supply on the occurrence of neural tube defects. J Am Med Assoc 285, 2981-2986, 2001
48. Hung J, Beilby JP, Knuiman MW, Divitini M: Folate and vitamin B-12 and risk of fatal cardiovascular disease: cohort study from Buselton, Western Australia. BMJ 326, 131-134, 2003
49. Jacques PF, Selhub J, Bostom AG, Wilson PWF, Rosenberg IH: The effect of folic acid fortification on plasma folate and total homocysteine concentrations. New Eng J Med 340, 1449-1454, 1999
50. James SJ, Pogribna M, Pogribny IP, Melnyk S, Hine RJ, Gibson JB, Yi P, Taftaya DL, Swenson DH, Wilson VL, Gaynor DW: Abnormal folate metabolism and mutation in the methylene-tetrahydrofolate reductase gene may be maternal risk factors for Down syndrome. Am J Hum Genet 67, 495-501, 1999
51. Kadir RA, Economides DL: Neural tube defects and periconceptional folic acid. CMAJ 167, 255, 2002
52. Koletzko B, von Kries R: Prevention of neural tube defects by folic acid administration in early pregnancy. Joint recommendations of the German Society of Nutrition, Gynecology and Obstetrics, Human Genetics, Pediatrics, Society of Neuropediatrics. Gynäkol Geburtshilfliche Rundschau 35, 2-5, 1995
53. Koletzko B, von Kries R: Folatanreicherung von Getreideprodukten zur Prävention angeborener Fehlbildungen und vaskulärer Erkrankungen. Stellungnahme der Ernährungskommission der Deutschen Gesellschaft für Kinderheilkunde und Jugendmedizin. Monatsschr Kinderheilkunde 3, 286-287, 2000
54. Laurence KM, James N, Miller M, Tennant G, Campbell H: Double-blind randomized controlled trial treatment before conception to prevent recurrence of neural tube defects. BMJ 282, 1509-1511, 1981
55. Lewis CA, Pancharuniti N, Sauberlich HE: Plasma folate adequacy as determined by homocysteine level. Ann N Y Acad Sci 669, 360-362, 1992
56. Li DK, Daling JR, Mueller BA, Hichok DE, Fanter AG, Weiss NS: Periconceptional multivitamin use in relation to the risk of congenital urinary tract anomalies. Epidemiol 6, 212-218, 1995
57. Li Z, Gindler J, Wang H, Berry RJ, Li S, Correa A, Zheng JC, Erickson JD, Wang Y: Folic acid supplements during early pregnancy and likelihood of multiple births: a population-based cohort study. Lancet 361, 380-384, 2003
58. Lumley J, Watson L, Watson M, Bower C: Periconceptional supplementation with folate and/or multivitamins for preventing neural tube defects (Cochrane Methodology Review). In: The Cochrane Library, Issue 4, Chester, UK, 2003. Auch unter: <http://www.cochrane.org>
59. Malinow MR, Bostom AG, Krauss RM: Homocyst(e)ine, diet, and cardiovascular disease. Statement for healthcare professionals from the Nutrition Committee, American Heart Association. Circulation 99, 178-182, 1999
60. Mathews TJ, Honein MA, Erickson JD: Spina bifida and anencephaly prevalence – United States, 1991-2001. MMWR Recomm Rep 51, 9-11, 2002
61. Mills J, Rhoads G, Simpson J, Cunningham G, Conley M, Lassman M, Walden M, Depp O, Hoffmann H: The absence of a relation between the periconceptional use of vitamins and neural tube defects. N Engl J Med 321, 430-435, 1989
62. Milunsky A, Jick H, Jick S, Bruell C, MacLaughlin D, Rothmann K, Willett W: Multivitamin/Folic acid supplementation in early pregnancy reduces the prevalence of neural tube defects. JAMA 262, 2847-2852, 1989
63. Moore LL, Bradlee ML, Singer MR, Rothman KJ, Milunsky A: Folate intake and the risk of neural tube defects: an estimation of dose-response. Epidemiology. 14, 200-205, 2003
64. Moyers S, Bailey LB: Fetal malformations and folate metabolism: review of recent evidence. Nutr Rev 59, 215-235, 2001
65. MRC Vitamin Study Research Group: Prevention of neural tube defects: Results of the Medical Research Council Vitamin Study. Lancet 338, 131-137, 1991
66. Mulinaire J, Cordero J, Erickson J, Berry R: Periconceptional use of multivitamins and the occurrence of neural tube defects. JAMA 260, 3141-3145, 1988
67. Nilsson K, Gustafson L, Hultberg B: Improvement of cognitive functions after cobalamin/folate supplementation in elderly patients with dementia and elevated plasma homocysteine. Int J Geriatric Psychiatry 16, 609-614, 2001
68. Oakley GP: Delaying folic acid fortification of flour. BMJ 324, 1348-1349, 2002
69. Persad VL, van den Hof MC, Dubé JM, Zimmer P: Incidence of open neural tube defects in Nova Scotia after folic acid fortification. Can Med Assoc J 167, 241-245, 2002
70. Phillips MD: Interrelated risk factors for venous thromboembolism. Circulation 95, 1749-1751, 1997
71. Pietrzik K: Homocysteine und Folsäure. Eine alte Beziehung in neuem Licht. BASF Health & Nutrition Transfer, 1998
72. Pietrzik K, Prinz-Langenohl R, Dierkes J: Die Beeinflussung des Homocysteinspiegels durch nutritive Gaben der Vitamine B₁₂, B₆ und Folsäure. Vitaminspur 10, 150-154, 1995
73. Quinlivan EP, Gregory JF 3rd: Effect of food fortification on folic acid intake in the United States. Am J Clin Nutr 77, 221-225, 2003
74. Rauth M, Verwied S, Knerr I, Dorr HG, Sonnichsen A, Koletzko B: Homocysteine concentrations in a German cohort of 500 individuals: reference ranges and determinants of plasma levels in healthy children and their parents. Amino Acids 20, 409-418, 2001
75. Ray JG, Meier CM, Vermeulen MJ, Boss S, Wyatt PR, Cole DEC: Association of neural tube defects and folic acid fortification in Canada. Lancet 360, 2047-2048, 2002
76. Reynolds E, Silleneider M: Fortification of flour with folic acid. BMJ 324, 918, 2002
77. Rieder MJ: Prevention of neural tube defects with periconceptional folic acid. Clin Perinatol 21, 483-503, 1994
78. Rimm EB, Willett WC, Hu FB, Sampson L, Colditz GA, Manson JE, Hennekens C, Stampfer MJ: Folate and vitamin B6 from diet and supplements in relation to risk of coronary heart disease among women. JAMA 279, 359-364, 1998
79. Rinke U, Koletzko B: Prävention von Neuralrohrdefekten durch Folsäurezufuhr in der Frühschwangerschaft. Dtsch Ärztebl 91, 30-37, 1994
80. Rösch C, Lehmann R, Kötz K, Steinbicker V: Folsäure und Schwangerschaft. Ernährungs-Umschau 46, 10-12, 1999
81. Schnyder G, Roffi M, Pin R, Flammer Y, Lange H, Eberli FR, Meier B, Turi ZG, Hess OM: Decreased rate of coronary restenosis after lowering of plasma homocysteine levels. N Eng J Med 345, 1593-1600, 2001
82. Schnyder G, Roffi M, Flammer Y, Pin R, Hess OM: Effect of homocysteine-lowering therapy with folic acid, vitamin B(12), and vitamin B(6) on clinical outcome after percutaneous coronary intervention: the Swiss Heart study: a randomized controlled trial. JAMA 288, 973-979, 2002
83. SCF (Scientific Committee on Food): Opinion of the Scientific Committee on Food on the tolerable upper intake level of folate. Scientific Committee on Food SCF/CS/NUT/UPPLEV/18 Final, November 2000, expressed October 2000. Unter: http://europa.eu.int/comm/food/fs/sc/scf/out80e_en.pdf. Zugang: März 2003
84. Selhub J, Jacques PF, Bostom AG, D'Agostino RB, Wilson PWF, Belanger AJ, O'Leary DH, Wolf PA, Schaefer EL, Rosenberg ICH: Association between plasma homocysteine concentrations and extracranial carotid-artery stenosis. New Engl J Med 332, 286-291, 1995
85. Seshadri S, Beiser A, Selhub J, Jacques PF, Rosenberg ICH, D'Agostino RB, Wilson PWF, Wolf PA: Plasma homocysteine as a risk factor for dementia and Alzheimer's disease. N Engl J Med 346, 476-483, 2002
86. Shaw GM, Wasserman CR, O'Malley CD: Periconceptional vitamin use and reduced risk of conotruncal and limb defects in California. Teratology 49, 372, 1994 (Abstr.)
87. Shaw GM, Schaffer D, Velie E, Morland K, Harris J: Periconceptional vitamin use, dietary folate, and the occurrence of neural tube defects. Epidemiol 6, 219-226, 1995a
88. Shaw GM, Lammer EJ, Wassermann CR, O'Malley CD, Tolarove MM: Risks of orofacial

Stellungnahme

- clefts in children born to women using multivitamins containing folic acid periconceptionally. *Lancet* 346, 393-396, 1995b
89. Shaw GM, Carmichael SL, Nelson V, Selvin S, Schaffer DM: Food fortification with folic acid and twinning among California infants. *Am J Med Genet* 119A, 137-140, 2003
90. Smithells R, Nevin N, Seller M, Sheppard S, Harris R, Read A, Fielding D, Walker S, Schorah C, Wild J: Further experience of vitamin supplementation for prevention of neural tube defect recurrences. *Lancet* 1, 1027-1031, 1983
91. Smithells RW, Sheppard S, Schorah CJ, Seller MJ, Nevin NC, Harris R, Read AP, Fielding DW: Apparent prevention of neural tube defects by periconceptional vitamin supplementation. *Arch Dis Child* 56, 911-918, 1981
92. Stampfer MJ, Malinow MR, Willett WC, Newcomer LM, Upson B, Ullmann D, Tishler PV, Hennekens CH: A prospective study of plasma homocyst(e)ine and risk of myocardial infarction in US physicians. *JAMA* 268, 877-881, 1992
93. Stanger O, Herrmann W, Pietrzik K, Fowler B, Geisel J, Dierkes J, Weger M für die DACH-Liga Homocystein: Konsensuspapier der DACH-Liga Homocystein über den rationellen klinischen Umgang mit Homocystein und Folsäure bei kardiovaskulären und thrombotischen Erkrankungen - Richtlinien und Empfehlungen. *J Kardiol* 10, 190-199, 2003
94. Statistisches Bundesamt: Jeder zweite Gestorbene erlag im Jahr 2001 einer Kreislauferkrankung. Pressemitteilung vom 13. Januar 2003. Unter: <http://www.destatis.de/presse/deutschland/pm2003/p0130092.htm>. Zugang: Juni 2003
95. Stolzenberg-Solomon RZ, Albanes D, Nieto FJ, Hartmann TJ, Tangrea JA, Rautalahti M, Sehluu J, Virtamo J, Taylor PR: Pancreatic cancer risk and nutrition related methyl-group availability indicators in male smokers. *J Natl Cancer Inst* 91, 535-541, 1999
96. Thompson JR, Fitz Gerald P, Willoughby MLN, Armstrong BK: Maternal folate supplementation in pregnancy and protection against acute lymphoblastic leukaemia in childhood: a case-control study. *Lancet* 358, 1935-1940, 2001
97. Tolarova M, Harris J: Reduced recurrence of orofacial clefts after periconceptional supplementation with high dose folic acid and multivitamins. *Eur J Clin Invest* 29, 1003-1009, 1995
98. Tönnz O: Folsäureprophylaxe – nicht nur zur Verhütung von Neuralrohrdefekten. *Gyn* 4, 272-280, 1999
99. Tönnz O: Vom Sinn und Zweck einer generellen Folsäure-Prophylaxe. *Schweiz Med Forum* 13, 303-310, 2002
100. Tönnz O, Lüthy J, Raunhardt O: Folsäure zur Verhütung von Neuralrohrdefekten. *Schweiz Med Wochenschr* 126, 177-187, 1996
101. Tucker KL, Mahnken B, Wilson PWF, Jacques P, Selhub J: Folic acid fortification of the food supply. Potential benefits and risks for the elderly population. *JAMA* 276, 1879-1185, 1996
102. Ubbink JB, Vermaak WJH, van der Merwe A, Becker PJ: Vitamin B₁₂, vitamin B₆, and folate nutritional status in men with hyperhomocysteinemie. *Am J Clin Nutr* 57, 47-53, 1993
103. U.S. Food and Drug Administration: Folic Acid Fortification. February 1996. Unter: <http://vm.cfsan.fda.gov/~dms/wh-folic./html/updated1.html>. Zugang: März 2003
104. U.S. Food and Drug Administration: How folic acid can help prevent birth defects. July 1996, revised February 1999. Unter: <http://vm.cfsan.fda.gov/~dms/fdafolic.html>. Zugang: März 2003
105. Van Rooij IALM, Vermeij-Keers C, Kluijtmans LAJ, Ocké MC, Zielhuis GA, Goorhuis-Brouwer SM, van der Biezen J, Kuijpers-Jagtman A, Steegers-Theunissen RPM: Does the interaction between maternal folate intake and the methylenetetrahydrofolate reductase polymorphism affect the risk of cleft lip with or without cleft palate? *Am J Epidemiol* 157, 583-591, 2003
106. Vergel R, Sanchez L, Heredero B, Rodriguez P, Martinez A: Primary prevention of neural tube defects with folic acid supplementation: Cuban experience. *Prenatal Diagnosis* 10, 149-152, 1990
107. Vollset SE, Cjessing HK, Tandberg A, Nilsen RM, Ronning T, Baste V, Daltveit AK: Preconceptional folate use and risk of a multiple birth. *J Inherit Metab Dis* 26, Suppl. 1, 41, 2003
108. Wald DS, Law M, Morris JK: Homocysteine and cardiovascular disease: evidence on causality from a meta-analysis. *BMJ* 325, 1202-1206, 2002
109. Werler MM, Shapiro S, Mitchell A: Periconceptional folic acid exposure and risk of occurrent neural tube defects. *JAMA* 269, 1257-1261, 1993
110. Williams LJ, Mai CT, Edmonds LD, Shaw GM, Kirby RS, Hobbs CA, Sever LE, Miller LA, Meaney FJ, Levitt M: Prevalence of spina bifida and anencephaly during the transition to mandatory folic acid fortification in the United States. *Teratology* 66, 33-39, 2002
111. Wright AJA, Finglas PM, Southon S: Proposed mandatory fortification of the UK diet with folic acid: have potential risks been underestimated. *Trends Food Science & Technology* 12, 313-321, 2002
112. Zhang S, Hunter DJ, Hankinson SE, Giovannucci EL, Rosner BA, Colditz GA, Speizer FE, Willett WC: A prospective study of folate intake and the risk of breast cancer. *JAMA* 281, 1632-1637, 1999

Korrespondenzadresse:

Univ.-Prof. Dr. med. Berthold Koletzko
Dr. von Haunersches Kinderspital
Klinikum der Ludwig-Maximilians-
Universität München
Lindwurmstr. 4
80336 München
E-Mail: Claudia.Wellbrock@med.uni-muenchen.de