

# Newsletter

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## How To Choose A Multiple Vitamin

James Meschino, DC, MS, ND  
Adeeva.com

Sixty percent of adults in North America are presently taking vitamin supplements each day. Of these, multiple vitamin and mineral supplement products are used most frequently. The primary reasons cited for taking a daily multiple vitamin include:

- to enhance energy and well-being
- to help defend against degenerative diseases such as cancer, heart disease, osteoporosis and dementia
- to help manage existing health conditions such as arthritis and diabetes
- to slow the aging process.

However, some people still argue that we can get all the vitamins and minerals we need from food alone in order to attain the Recommended Daily Allowances (RDAs) for each nutrient, therefore supplements are not necessary. Individuals who have done their homework on this subject know that 80 to 91% of the population do not achieve the RDAs for each vitamin and mineral each day, nor do they even come close. In fact marginal nutrient deficiencies are present in as much as 50% of non multiple vitamin and mineral users (1). As well, the RDA levels for each nutrient are only intended to guard against severe nutrient deficiency diseases such as scurvy (Vitamin C), pellagra (Niacin), and beriberi (Vitamin B1), but are not intended to serve as levels of vitamin and mineral intake that are optimal in regards to preventing degenerative diseases, slowing the biological processes of aging and maximizing our well-being and longevity (2). In the past two decades a great deal of evidence has demonstrated that ingesting certain vitamins and minerals at levels beyond which can be routinely achieved from food alone is associated with a reduction in risk of many degenerative diseases and appears to slow important aspects of the aging process. These research findings have led to the increased use of multiple vitamin supplements by the general public. However, knowing what to look for in a multiple vitamin is crucial in terms of deriving the best available benefits. Most multiple vitamin products include all vitamins and minerals from A to zinc, but often at insufficient doses to provide the disease prevention and anti-aging benefits you should be seeking. Here are the features you should look for in a multiple vitamin and mineral product to ensure that you get the protection and benefits you deserve:

### Antioxidant Enrichment

A desirable multiple vitamin and mineral product should be enriched with antioxidants at the following levels: Vitamin C (500-1,000 mg), Vitamin E (200-400 IU, natural source), Beta-carotene (7,500-20,000 IU), selenium (100-200 mcg), Vitamin A (2,000-3,000 IU), with additional lycopene and lutein. These recommendations stem from the understanding that antioxidants quench and neutralize dangerous free radicals that are linked to cancer development (free radicals damage the DNA of our cells causing cancerous mutations), heart disease, damage to brain cells linked to the development of Alzheimer's disease and dementia, cataracts and macular degeneration of the eye (the leading cause of blindness in people over the age of 55), and accelerated aging of our skin and other tissues. Each

day our tissues are bombarded with free radicals, which arise from our use of oxygen in normal metabolism (free radicals are a by-product of oxygen metabolism in the body). Other environmental factors increase our exposure to free radicals, including cigarette smoke, alcohol consumption, nitrosamines (nitrate treated foods), and other environmental agents (i.e., aromatic hydrocarbons, heterocyclic amines, nitric oxide), including the damage done to our skin and eyes by excessive sun

exposure. A large body of evidence has demonstrated that bolstering our antioxidant defences can protect our tissues against the damaging effects of free radicals and has been shown to help reduce the risk of the degenerative diseases and conditions mentioned above. In fact, a number of clinical trials reveal that even certain precancerous conditions can be reversed through targeted antioxidant vitamin and mineral supplementation. (3 - 65)

Antioxidant supplementation has also been shown to improve immune system function in older patients (who normally show immune decline with aging) and slows down key aspects of the aging process itself (66-71). The problem is that most multiple vitamins in the market place do not contain adequate antioxidant levels, forcing consumers to purchase additional Vitamin C, Vitamin E, selenium, Beta-carotene etc., to achieve appropriate antioxidant protection. This is too expensive, impractical and unnecessary as high quality multiple vitamins now contain everything you need in one product.

### **B-50 Complex**

A well-designed multiple vitamin should also provide a full complement of the B-vitamins as a B-50 complex. Enhanced B-vitamin status through supplementation has been shown to help reduce risk of heart disease, reduce certain inflammatory states, improve detoxification processes and maintain brain and cognitive function as we age. B-vitamins are essential in the synthesis of brain chemicals required for thinking, memory and other vital brain activities. B- vitamins are essential for the synthesis of red blood cells, normal cell replication from one generation to the next and many more crucial functions (72 -106). Known for their anti-stress and anti-fatigue properties, a B-50 complex is an important element of a high-grade multiple vitamin and mineral formulation. Be sure your multiple vitamin contains at least 50 mg of Vitamins B1, B2, B3, B6, and pantothenic acid, as well as 50 mcg of B12.

### **Bone Support Nutrients**

In North America , at least one on four women currently develops osteoporosis by age 50 and one in eight men develop this condition after the age of 65. In women, complications of osteoporotic fractures cause more deaths each year than the combined mortality rate from breast and ovarian cancers. Osteoporosis is an extremely important problem that requires a lifelong strategy to prevent its development. Central to the prevention of osteoporosis is the adequate daily intake of calcium, Vitamin D, magnesium, copper and zinc, which together are the essential bone strengthening nutrients. Studies show that across the population most adults (including 11-24 year olds) are lacking at least 500 mg of calcium per day in their diet, on average to prevent the future development of osteoporosis (107-121). Vitamin D nutritional status is also sub-optimal (Vitamin D is necessary to absorb calcium) as is the consumption of zinc (122-128). Thus, a well designed multiple vitamin should contain 350-500 mg of elemental calcium, 400 IU of Vitamin D, 15 mg of zinc, 150-250 mg of magnesium and 1-2 mg of copper. This is an important consideration for all individuals 12 years and older. In addition to high potency multiple vitamin and mineral many individuals require further supplementation with

calcium and vitamin D to achieve optimal intake levels that protect against osteoporosis and cancer. If you are not exposed to adequate sunlight year round then your daily total vitamin D supplementation target is likely to be 1000 – 2000 IU per day. Have your blood level of vitamin D checked. If the value is below 85nmol/L then increase your vitamin D supplementation levels to achieve at blood value that is above 85nmol/L, and not exceeding 250 nmol/L.

### **Other Benefits**

A multiple vitamin and mineral product that is antioxidant enriched, contains a B-50 complex and proper doses of bone building nutrients (i.e., 500 mg of calcium) can not only help defend your body and mind against degenerative conditions and slow the biological processes of aging, but can also help to improve the quality and texture of your skin, hair and nails, improve sleep quality, strengthen your immune system and enhance your daily energy level. All of these outcomes are frequently reported by individuals taking multiple vitamins that meet the criteria outlined in this review. In my view, all individuals 16 years of age and older should take the nutrient doses provided by a high quality multiple vitamin and mineral product each day to optimize their health. (Unless contra-indicated due to a specific medical condition). Below, see the daily doses contained within the Adeeva Multiple Vitamin and Mineral, which meets the criteria discussed in the review. This

supplement or one of similar composition is an important foundation product for individuals who understand the importance of nutritional supplementation in health optimization, disease prevention and preserving their quality of life.

|   |          |
|---|----------|
| Vitamin A (palmitate)                       | 2500 IU  |
| Beta Carotene                               | 10000 IU |
| Vitamin D (cholecalciferol)                 | 400 IU   |
| Vitamin E (d-alpha tocopherol succinate)    | 400 IU   |
| Vitamin C (ascorbic acid)                   | 1000 mg  |
| Vitamin B-1 (thiamine mononitrate)          | 50 mg    |
| Vitamin B-2 (riboflavin)                    | 50 mg    |
| Niacin (niacinimide)                        | 50 mg    |
| Vitamin B-6 (pyridoxine hydrochloride)      | 50 mg    |
| Vitamin B-12 (cyanocobalamin)               | 50 mcg   |
| Folic Acid                                  | 400 mcg  |
| Biotin                                      | 300 mcg  |
| D-Pantothenic Acid (calcium d-pantothenate) | 50 mg    |
| Calcium (carbonate & citrate)               | 500 mg   |
| Iron (ferrous fumarate)                     | 6 mg     |
| Magnesium (magnesium oxide)                 | 200 mg   |
| Zinc (citrate)                              | 15 mg    |
| Copper (gluconate)                          | 2 mg     |
| Chromium (hvp chelate)                      | 50 mcg   |
| Manganese (gluconate)                       | 5 mg     |
| Selenium (hvp chelate)                      | 100 mcg  |
| Molybdenum (citrate)                        | 50 mcg   |
| Bioflavonoids (citrus complex)              | 50 mg    |
| Lycopene (5%)                               | 6 mg     |
| Lutein (5%)                                 | 6 mg     |

## References

1. United States Department of Agriculture, Food Technology, 1981; 35: 9. The National Health and Nutrition Examination Survey II (NHANES II)
2. Nutrition For Living – second Edition, The Benjamin/Cummings Publishing Companies, Inc., 1988: 12-14
3. Gutteridge, John M. Antioxidants, Nutritional Supplements, and Life-Threatening Diseases; British Journal of Biomedical Science, Vol. 31 (1994), pp. 288-95
4. Ames , Bruce N. et al. Oxidants, Antioxidants, and the Degenerative Diseases of Aging; Proceedings of the National Academy of Science, Vol. 90 (September 1993), pp. 7915-22
5. Saman, Z., et al. Plasma Concentrations of Vitamins A and E and Carotenoids in Alzheimer's Disease; Age and Ageing, Vol. 21 (1992), pp.91-94
6. Carney, John and Ann. Role of Protein Oxidation in Aging and in Age Associated Neurodegenerative Disease, Life Sciences, Vol. 55, No. 25-26 (1994), pp.1-7
7. Smith, Charles D., Carney, John M., Tatsumo, Tohru, et al. Protein Oxidation in Aging Brain; Annals of the New York Academy of Sciences: Aging and Cellular Defense Mechanism, Vol663 (1003), pp.110-19
8. Stampfer, M.J., et al. Vitamin E Consumption and the Risk of Coronary Disease in Women; New England Journal of Medicine, Vol. 328 (May 20, 1993), pp.1444-49
9. Rimm, Eric B., et al. Vitamin E Consumption and Risk of Coronary Disease in Men; New England Journal of Medicine, Vol. 328 (May 20), 1993, pp.1450-56
10. Steinberg, D. Clinical Trials of Antioxidants in Atherosclerosis: Are We Doing the Right Thing? Lancet, Vol. 346 (1995), pp.36-38
11. Gey, K.E. Inverse Correlation Between Plasma Vitamin E and Mortality from Ischemic Heart Disease in Cross-Cultural Epidemiology; American Journal of Clinical Nutrition, Vol. 53 (1991) pp. 3265-345
12. Rimm, E.B., Stampfer, A., Ascherio, E. Giovannucci, G.A. Colditz, and W. Willett. Vitamin E Consumption and the Risk of coronart Heart Disease in Men; The New England Journal of Medicine, Vol. 328 (1993), pp. 1450-56
13. Stampfer, M.J., Hennekens, C.H., Manson, J.E., Colditz, G.A., Rosner, B., and W.C. Willett. Vitamin E Consumption and the Risk of coronary Disease in Women; The New England Journal of Medicine, Vol. 328 (1993), pp. 1444-49

14. Gaziano, J.M. Antioxidant vitamins and Coronary Artery Disease Risk; *American journal of Medicine*, Vol. 97 (Suppl. 3A) (1994), pp. 195-215
15. Gaziano, J.M., Manson, J.E., Branch, L.G., LaMott, F., Colditz, J.E., and C.H.Hennekens. Dietary Beta-carotene Intake and Decreased Cardiovascular Mortality in an Elderly Cohort; *Journal of the American College of Cardiology*, Vol. 19 (1992), p.377
16. Enstrom, J.E., Kanim, L.E., and Klein, M.A. Vitamin C Intake and a Sample of the United States Population; *American Journal of Epidemiology*, Vol.3 (1992), pp. 194-202
17. Blot, W.J., Li, J.-Y., Tgaylor, P.R., Guo, W., Dawsey, S., Wang, G.-Q., et al. Nutrition Intervention Trials in Linxian, China: Supplementation with Specific Vitamin/Mineral Combinations, Cancer Incidence and Disease-Specific Mortality in the General Population; *Journal of the National Cancer Institute*, Vol. 85 (1993), pp. 1483-92
18. Byers, T. and Perry, G. Dietary Carotenoids, Vitamin C, and Vitamin E as Protective Antioxidants in human Cancers; *Annual Review of Nutrition*, Vol. 12 (1992), pp. 139-59
19. Block, G., Patterson, and Subar, A. Fruits, Vegetables and Cancer Prevention: A Review of the Epidemiologic Evidence; *Nutrition and Cancer*, Vol.187 (1992), pp. 1029
20. Zeigler, R. Vegetables, Fruits, and Carotenoids and the Risk of Cancer; *American Journal of Clinical Nutrition*, Vol. 53 (1991), pp.2515-2595
21. Weisburger, J. Nutritional Approach to Cancer Prevention with Emphasis on Vitamins, Antioxidants, and Carotenoids; *American journal of Clinical Nutrition*, Vol. 53 (1991), pp. 2265-2375
22. Frolich, L. and Riederer, P. Free Radical Mechanisms in Dementia of Alzheimer Type and the Potential for Antioxidative Treatment; *Drug Research* Vol. 45, No.1 (1995), pp. 443-46
23. Reiter, R.J. Oxidative Processes and Antioxidant Mechanisms in the Aging Brain; *FASEB Journal* (1995), p.526
24. White, Richard P. and Robertson, James T. Basic Concepts of Antioxidant Therapy; *Journal of the Tennessee Medical Association*, vol.88, No.2 (1995), pp.54-58
25. Evans. Oxidative Damage in Alzheimer's Dementia, p.178
26. Richardson . Free Radicals and Alzheimer's Disease, p.13
27. Yoshikawa, T. Free Radicals and their Scavengers in Parkinson's Disease; *Journal of European Neurology*, Vol.33, Supp.1 (1993), pp.60-68
28. Meydani, Mohsen. Vitamin E Requirements in Relation to Dietary Fish Oil and Oxidative Stress in the Elderly; *Free Radicals and Aging*, ed. 1. Emerit and B. Chance, Zurich, Switzerland, Birkhauser Verlag, 1992, p.411-418
29. Bunce, G.E. Antioxidant Nutrition and Cataract in Women: A Prospective Study; *Nutrition Reviews*, Vol.51, No.3 (1993), pp.84-85
30. Seddon, Johanna M., et al. The Use of Vitamin Supplements and the Risk of Cataract Among U.S. Male Physicians; *American Journal of Public Health*, Vol.84, No.5 (1994), pp.788-92
31. Christen, William, G. Antioxidants and Eye Disease; *The American Journal of Medicine*, Vol.97, Supp. 3A (1994), pp.145-175
32. Van Der Hagen, Anita M., et al. Free Radicals and Antioxidant Supplementation: A Review of their Roles in Age-Related Macular Degeneration; *Journal of the American Optometric Association*, Vol.64 (1993), pp.871-78
33. Christen. Antioxidants and eye diseases, pp.145-175
34. Robertson, James M.D., et al. A Possible Role for Vitamins C and E in Cataract prevention; *American Journal of Clinical Nutrition*, Vol. 53 (1991), pp.3465-3515
35. Jacques, Paul E., et al. Antioxidant Status in Persons with and without Senile Cataract; *Archives of Ophthalmology*; Vol.106 (1988), pp.337-340
36. Seddon, J.M. Dietary Carotenoids, Vitamins A, C and E, and Advanced Age-Related Macular Degeneration; *JAMA*, Vol.272, No.18 (1994), pp.1413-20
37. Clark, I.C., et al. Effects of selenium supplementation for cancer prevention in patients with carcinoma of the skin. *JAMA*, 1996. 276: 24: 1957-63
38. Giovannucci, et al. Intake of carotenoids and retinol in relation to risk of prostate cancer. *J Natl Cancer Inst* 1995, 87; 23: 1767-76
39. Rao, V.A., et al. Serum and tissue lycopene and biomarkers of oxidation in prostate cancer patients: A case control study. *Nutr and Cancer*, 1999; 33: 2: 159-164
40. Sigounas, G., et al. DL-alpha-tocopherol induces apoptosis in erythroleukemia, prostate and breast cancer cells. 1997, *Nutrition and Cancer*, 28; 1: 30-35
41. Heinonen, O.P., et al. Prostate cancer and supplementation with Alpha-Tocopherol and Beta-carotene: Incidence and mortality in a controlled trial. *J Natl Cancer Inst* 1998, 909; 6: 440-446
42. Losonczy, Katalin, G., et al. Vitamin E and Vitamin C Supplement Use and Risk of all-cause and Coronary Heart Disease Mortality in Older Persons: The Established Populations for Epidemiologic Studies of the Elderly

43. Emmert, O.H., et al. The Role of Vitamin E in the Prevention of Heart Disease; Arch Family Med. 1999; 8:6:537-542
44. Stampfer, M., et al. epidemiologic Evidence fro Vitamin E in Prevention of cardiovascular Disease. Am J ConNutr, 1995, 62 (supple): 1356-69
45. Jimenez-Jimenez, F.J., et al. Serum levels of beta-carotene, alpha-carotene and vitamin A in patients with Alzheimer's disease. Eur J Neurol 1999 Jul; 6 (4): 495-7
46. Vatassery, G.T., et al. High doses of vitamin E in the treatment of disorders of the central nervous system in the aged. Am J Clin Nutr 1999, Nov; 70 (5): 793-801
47. Smith, M.A., et al. Oxidative stress in Alzheimer's disease. Biochem Biophys Acta 2000 Jul 26; 1502 (1): 139-144
48. Dagnelie, G., et al. Lutein improves visual function in some patients with retinal degeneration: a pilot study via the Internet. Optometry 2000, 71: 3; 147-164
49. Seddon, J.M., et al. Dietary Carotenoids, vitamin A, C, and E, and advanced age-related macular degeneration. JAMA 1994, 272: 1413-1420
50. Mares-Perlmen, J.A., et al. Serum antioxidants and age-related macular degeneration in a population-based case control study. Arch Ophthalmol 1988. 113: 1518-1523
51. Jampol, L.M., et al. Age-Related Eye Disease Study Research Group (collective name-AREDS). A randomized, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E, betacarotene, and zinc for age-related macular degeneration and vision loss: AREDS report no.8. Arch Ophthalmol 2001 Oct; 119 (10): 1417-36
52. West, S., et al. Are antioxidants or supplements protective of age-related macular degeneration? Arch Ophthalmol. 1994. 112: 222-227
53. Olson, R. J. Supplemental antioxidant vitamins and minerals in patients with macular degeneration. J Am Coll Nutr, 1991; 10: 550/Abstract 52
54. Richer, S. Multicenter Ophthalmic and Nutritional age-related macular degeneration study. Part 1: Design, Subjects and procedure. J Am Optom Assoc 1996, 67: 12-29
55. Richer, S., Part 2 Multicenter Ophthalmic and Nutritional age-related macular degeneration study, Part 1: Design, Subjects and Procedure. J Am Optom Assoc 1996, 67: 30-49
56. Robertson, J., et al. A possible role for vitamin C and E in cataract prevention. Am J Clin Nutr, 1991, 53: 1: 346-351 (suppl)
57. Stone, W.L., et al. Tocopherols and the etiology of colon cancer. J Natl Cancer Instit. 1997, 89; 4: 1006-1014
58. Blot, W.J., et al. The Linxian trials: mortality rates by vitamin-mineral intervention group. Am J Clin Nutr. 1995, 62; 6: 1424-1426 (suppl)
59. Bandaru, S., et al. Chemoprevention of colon cancer by organoselenium compounds and impact of high or low-fat diets. J natl Cancer Instit. 1997, 89; 7: 506-512
60. Clark, L.C., et al. Effects of selenium supplementation for cancer prevention in patients with carcinoma of the skin. JAMA, 1996, 276; 24: 1957-1963
61. Russo, M.W., et al. Plasma selenium levels and the risk of colorectal adenomas. Nutr Cancer 1997, 28; 2:125-129
62. Willett, W.C., et al. Prediagnostic serum selenium and risk of cancer. Lancet, 1983, 2: 130-134
63. Kyrtopoulos, S. Ascorbic acid and the formation of N-nitroso compounds: possible role of ascorbic acid in cancer prevention. Am J Clin Nutr. 1987, 45; 5: 1344-1350
64. Tannenbaum, S.R., et al. Inhibition of nitrosamine formation by ascorbic acid. Am J Clin Nutr 1991, 53; 1: 247-250 (suppl)
65. Block, G. Vitamin C and cancer prevention: the epidemiologic evidence. Am J Clin Nutr. 1991, 53; 1: 270-282 (suppl)
66. Shronts, Eva P. 11 Basic concepts of Immunology and Its Application to Clinical Nutrition; Nutrition in clinical Practice, #4 (19913), p.177; also Lancet, Vol.340 (November 7, 1992), pp.1124-27
67. Chandra, Ranjit K. Effect of Vitamin and Trace-Element Supplementation on Immune Responses and Infection in Elderly Subjects; Lancet, Vol. 340 (1992), pp. 1124-27
68. Breecher interview with Dr. Blumberg. Also Vitamins, Trace Elements, and Immunologic Youth; Patient Care (March 16, 1993), pp. 21-22
69. Chandra. Effect of Vitamin and Trace-Element Supplementation
70. Breecher interview with Meydani et al. Antioxidants and the Aging Immune Response; Antioxidants, Nutrients, and Immune Functions; ed. Adrienne Bendich, Marshall Phillips, and Robert P. Tengerdy (New York: Plenum, 1988), p.57
71. Bogden, John, et al. Daily Micronutrient Supplements Enhance Delayed Hypersensitivity Skin Test Results in Older People; American Journal of Clinical Nutrition, Vol.60, No.3 (September 1994), p.437

72. Food, Nutrition and Diet Therapy (7th edition.) Krause M and Mahan K edit. W.B. Saunders Company 1984:119-132
73. Pressman, A and Adams, A. Clinical Assessment of Nutritional Status: a working manual. (published by Management Enterprises, New York , 1982): 29-36
74. Werbach, M. Nutritional Influences on Illness. (published by Third Line press, Inc., California , 1987)
75. Pizzorno, J. Total Wellness. (published by Prima Publishing , U.S. , 1996); Normalizing Inflammatory Function: 163-191
76. Jennings E. Folic acid as a cancer-preventing agent. Med Hypotheses 45, 297-303, 1995.
77. Butterworth CE, Jr., Hatch KD, Gore H, Krumdieck CL. Improvement in cervical dysplasia associated with folic acid therapy in users of oral contraceptives. Am J Clin Nutr 35, 73-82, 1982.
78. VanEenwyk J, Davis FG, Colman N. Folate, vitamin C and cervical intraepithelial neoplasia. Cancer Epidemiol Biomarkers Prev 1, 119-124, 1992.
79. Butterworth CE, Jr., Hatch KD, Macaluso M, Cole P, Sauberlich HE et al. Folate deficiency and cervical dysplasia. JAMA 267, 528-533, 1992.
80. Morrison HI, Schaubel D, Desmeules M, Wigle DT. Serum folate and risk of fatal coronary heart disease. JAMA. 1996;275:1883-1896
81. Chasan-Taber L, Selhub J, Roseberg IH, et al. A prospective study of folate and vitamin B6 and risk of myocardial infarction in US physicians. J Coll Nutr. 1996;15:136-143
82. Giovannucci E, Stampfer MJ, Colditz GA, et al. Folate, methionine, and alcohol intake and risk of colorectal adenoma J Natl Cancer Inst. 1993;85:875-884
83. Selhub J, Jacques PF, Wilson PWF, Rush D, Roseberg IH. Vitamin status and intake as primary determinants of homocysteinemia in an elderly population. JAMA, 1993;270:2693-2698
84. Rimm EB, Stampfer MJ, Ascherio A, Giovannucci E, Willett WC. Dietary folate, vitamin B6, and vitamin B12 intake and risk of CHD among a large population of men. Circulation. 1996;93:625. Abstract
85. Pancharuniti N, Lewis CA, Sauberlich HE, et al. Plasma homocysteine, folate, and vitamin B12 concentrations and risk for early-onset coronary artery disease. Am J Clin Nutr. 1994;59:940-948
86. Bendich A. Folic acid and prevention of neural tube birth defects: critical assessment of FDA proposals to increase folic acid intakes. J Nutr Educ. 1994; 26:294-299
87. Riggs K. et al. Relations of vitamin B12, Vitamin B6, Folate, and homocysteine to cognitive performance in the Normative Aging Study. Am. J. Clin. Nutr. 1996; 63:306-14.
88. Martin DC. B12 and folate deficiency dementia. Clin Geriatr Med 1988;4:841-52.
89. Abou-Saleh MT, Coppen A. The biology of folate in depression: implications for nutritional hypotheses of the psychoses. J Psychiatr Res 1986;20:91-101.
90. Sauberlich HE. Relationship of vitamin B6, vitamin B12, and folate to neurological and neuropsychiatric disorders. In: Bendich A, Butterworth CE Jr, eds. Micronutrients in health and in disease prevention. New York : Marcel Dekker, Inc, 1991:187-218.
91. Bohnen N, Jolles J, Degenaar CP. Lower blood levels of vitamin B12 are related to decreased performance of healthy subjects in the Stroop Color-Word Test. Neurosci Res Commun 1992;11:53-6.
92. Goodwin JS, Goodwin JM, Garry PJ. Association between nutritional status and cognitive functioning in a healthy elderly population. JAMA 1983;249:2917-21.
93. Joosten E, van den Berg A, Riezler R, et al. Metabolic evidence that deficiencies of vitamin B12 (cobalamin), folate, and vitamin B6 occur commonly in elderly people. Am J Clin Nutr 1993;58:468-76.
94. Lindenbaum J, Rosenberg IH, Wilson PWF, Stabler SP, Allen RH. Prevalence of cobalamin deficiency in the Framingham elderly population. Am J Clin Nutr 1994;60:2-11.
95. Leklem JE. Vitamin B6. A status report. J Nutr 1990;120:1503-7.
96. Carney MWP, Toone BK, Reynolds EH. S-Adenosylmethionine and affective disorder. Am J Med 1987;83(suppl 5A):104-6.
97. Levitt AJ, Joffe RT. Folate, vitamin B12, and life course of depressive illness. Biol Psychiatry 1989;25:867-72.
98. Shane B, Stokstad ELR, Vitamin B12 folate interrelationships. Annu Rev Nutr 1985;5:115-41.
99. Dakshinamurti K, Paulose CS, Siow YL. Neurobiology of pyridoxine. In: Reynolds RD , Leklem JE, eds. Vitamin B6: its role in health and disease. New York : Alan R Liss, Inc, 1985;99-121.
100. Selhub J, Jacques PJ, Wilson PWF, Rush D, Rosenberg IH. Vitamin status and intake as primary determinants of homocysteinemia in the elderly. JAMA 1993;270:2693-8.
101. Jacques PJ, Riggs KM. B vitamins as risk factors for age-related diseases. In: Rosenberg IH, ed. Nutritional assessment of elderly populations. Measure and function. New York : Raven Press, 1995.

102. Berg S. Psychological functioning in 70-and 75-year old people. *Acta Psychiatr Scand* 1980;Suppl 288:1-47.
103. Botwinick J, Storandt M. *Memory, related functions and age*. Springfield , IL : Charles C Thomas, 1974.
104. Hertzog C, Schaie KW, Gribbin K. Cardiovascular disease and changes in intellectual functioning from middle to old age. *J Gerontol* 1978;33:872-83.
105. Rinn WE. Mental decline in normal aging: A review. *J Geriatr Psychiatry Neurol* 1988;1:144-58.
106. Spieth W. Slowness of task performance and cardiovascular disease. In: Welford AT, Birren JE, eds. *Behavior, aging and the nervous system*. Springfield , IL : Charles C Thomas, 1965:366-400.
107. Optimal Calcium Intake: NIH Consensus Panel. *JAMA*, 1994;272(24):1942-48.
108. Honley D. et al. Prevention and management of osteoporosis. *Can Med Asso J* 1996;155;(7):921-23.
109. Ettinger B., Genant H.K., Cann C.E. Postmenopausal bone loss is prevented by treatment with low-dosage estrogen with calcium. *Ann Intern Med* 1987;106:40-5.
110. Elders P.J.J., Netelenbos J.C., Lips P., van Ginkel F.C. Calcium supplementation reduces perimenopausal bone loss. *J Bone Miner Res* 1989;4(suppl):1128(abstr).
111. Stepan J.J., Pospichal J., Prest J., Pacovsky V. Prospective trial of ossein-hydroxyapatite compound in surgically induced postmenopausal women. *Bone* 1989;10:179-85.
112. Dawson-Hughes B., Dallal G., Tannenbaum S., Sahyoun N., Krall E. Effect of calcium supplements on postmenopausal bone loss. *J Bone Miner Res* 1989;4(suppl):109(abstr).
113. Llyod T.L. et al. Calcium supplementation and bone mineral density in adolescent girls. *JAMA* 1993;270:841-4.
114. Polley K.J., Nordin B.E.C., Baghurst P.A., Walker C.J., Chatterton B.E. Effect of calcium supplementation on forearm bone mineral content in postmenopausal women: a prospective, sequential controlled trial. *J Nutr* 1987;117:1929-35.
115. Smith E.L., Gilligan C., Smith PE., Sempos C.T. Calcium supplementation and bone loss in middle-aged women. *Am J Clin Nutr* 1989;50:833-42.
116. Windsor A.C.M. et al. The effect of whole-bone extract on 47 calcium absorption in the elderly. *Age and Aging* 1973;2:230-234.
117. Dawson-Hughes B. Calcium supplementation and bone loss: a review of controlled clinical trials. *Am J Clin Nutr* 1991;54:274(S)-280(S).
118. Harvey J.A., Zobitz M.M., Pak C.Y.C. Dose dependency of calcium absorption: a comparison of calcium carbonate and calcium citrate. *J Bone Miner Res* 1988;3:253-8.
119. Taking Supplements for osteoporosis: Advice for the Pharmacist. Jason Sit. [mycefuge@geacities.com](mailto:mycefuge@geacities.com).
120. Horowitz M. et al. Oral calcium suppresses biochemical markers of bone resorption in normal men. *Am J Clin Nutr* 1994;60:965-968.
121. Reid I.R., Ames R.W., Evans M.C., Gamble G.D., Sharpe S.J. Effect of calcium supplementation on bone loss in postmenopausal women. *N Engl J Med* 1993;328:460-4.
122. Chapuy M.C., Arlot M.E., Duboeuf F. et al. Vitamin D3 and calcium prevent hip fractures in elderly women. *N Engl J Med* 1992;327:1637-42.
123. Kinyamu, H.K. Dietary Calcium and Vitamin D intake in elderly woman: effect on serum parathyroid hormone and vitamin D metabolites. *Am J Clin Nutr* 1998; 67: 342-8
124. Dawson-Hughes, B. et al. Rates of bone loss in postmenopausal women randomly assigned to one of two dosages of vitamin D. *Am J Clin Nutr* 1995; 61: 1140-5
125. Kreiger, N., et al. Dietary factors and fracture in postmenopausal women: a case-control study. *Int J Epidemiol* 1992: 21953-8
126. Dawson-Hughes, B., et al. Effect of calcium and vitamin D supplementation on bone density in men and women 55 yers of age and older. *N Engl J Med* 1997; 337: 670-6
127. Devine A. C. Rosen, Mohan S., Baylink D., Prince R. Effects of zinc and other nutritional factors on insulin like growth factor I and insulin-like growth factor binding proteins in postmenopausal women. *Am J Clin Nutr* 1998; 68:200-6.
128. Droke EA, Spears JW, Armstrong JD, Kegley EB, Simpson RB. Dietary zinc affects serum concentrations of insulin and insulin-like growth factor I in growing lambs. *J Nutr* 1993; 123:13-9.