

## Citations and Reference Literature: Boron

### Citations

1. Strum SB. Boron: maintains bones, joints, neurons and may reduce prostate cancer risk. *LE Magazine* 2003. Available at [http://www.lef.org/magazine/mag2003/nov2003\\_report\\_boron\\_01.htm](http://www.lef.org/magazine/mag2003/nov2003_report_boron_01.htm). Accessed October 3, 2003.
2. Nielsen FH. Studies on the relationship between boron and magnesium which possibly affects the formation and maintenance of bones. *Magnes Trace Elem* 1990;9:61-69.
3. Nielsen FH, Hunt CD, Mullen LM, Hunt JR. Effect of dietary boron on mineral, estrogen, and testosterone metabolism in postmenopausal women. *FASEB J* 1987;1:394-397.
4. Travers RL, Rennie GC, Newnham RE. Boron and arthritis: the results of a double-blind pilot study. *J Nutr Med* 1990;1:127-132.
5. Zhang ZF, Winton MI, Rainey C et al. Boron is associated with decreased risk of human prostate cancer. *FASEB J* 2001;15:A1089.
6. Cui Y, Winton MI, Zhang ZF et al. Dietary boron intake and prostate cancer risk. *Oncol Rep* 2004;11:887-892.
7. Nielsen FH. Facts and fallacies about boron. *Nutr Today* 1992;6-12.
8. Rainey CJ, Nyquist LA. Dietary boron intake of adult males and related food consumption patterns. *Experimental Biology 2001 Meeting*. Orlando, Fla; 2001:Abstract 834.834.
9. Kelly GS. Boron: a review of its nutritional interactions and therapeutic uses. *Altern Med Rev* 1997;2:48-56.
10. Newnham RE. The role of boron in human nutrition. *J Appl Nutr* 1994;46:81-85.
11. Panel on Micronutrients, Subcommittees on Upper Reference Levels of Nutrients and of Interpretation and Use of Dietary Reference Intakes, and the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board. *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc*. Washington, DC: National Academy Press; 2001.
12. Nielsen FH. Ultratrace minerals. In: Shils ME, Young VR, eds. *Modern Nutrition in Health and Disease*. Philadelphia: Lea & Febiger; 1988:281-283.
13. Restuccio A, Mortensen ME, Kelley MT. Fatal ingestion of boric acid in an adult. *Am J Emerg Med* 1992;10:545-547.
14. Nielsen FH, Penland JG. Boron supplementation of peri-menopausal women affects boron metabolism and indices associated with macromineral metabolism, hormonal status and immune function. *J Trace Elem Exp Med* 1999;12:251-261.
15. Gallardo-Williams MT, Maronpot RR, King PE et al. Effects of boron supplementation on the morphology, PSA levels, and proliferative activity of LNCaP tumors in nude mice. *Proc Am Assoc Cancer Res* 2002;43:77.
16. Gallardo-Williams MT, Maronpot RR, Wine RN et al. Inhibition of the enzymatic activity of prostate-specific antigen by boric acid and 3-nitrophenyl boronic acid. *Prostate* 2003;54:44-49.
17. Gallardo-Williams MT, Maronpot RR, Turner CH et al. Effects of boric acid supplementation on bone histomorphometry, metabolism, and biomechanical properties in aged female F-344 rats. *Biol Trace Elem Res* 2003;93:155-170.
18. Gallardo-Williams MT, Chapin RE, King PE et al. Boron supplementation inhibits the growth and local expression of IGF-1 in human prostate adenocarcinoma (LNCaP) tumors in nude mice. *Toxicol Pathol* 2004;32:73-78.
19. Zhang ZF, Winton MI, Rainey C et al. Boron is associated with decreased risk of human prostate cancer. *Experimental Biology 2001 Meeting*. Orlando, Fla; 2001: Abstract 834.833.
20. Naghii MR, Samman S. The effect of boron supplementation on its urinary excretion and selected cardiovascular risk factors in healthy male subjects. *Biol Trace Elem Res* 1997;56:273-286.
21. Nielsen FH, Shuler TR, Gallagher SK. Effects of boron depletion and repletion on blood indicators of calcium status in humans fed a magnesium-low diet. *J Trace Elem Exp Med* 1990;3:45-54.
22. Nielsen FH. Biochemical and physiologic consequences of boron deprivation in humans. *Environ Health Perspect* 1994;102 Suppl 7:59-63.
23. Nielsen FH. Boron—an overlooked element of potential nutritional importance. *Nutr Today* 1988;23:4-7.
24. Hunt CD. Dietary boron modified the effects of magnesium and molybdenum on mineral metabolism in the cholecalciferol-deficient chick. *Biol Trace Elem Res* 1989;22:201-220.
25. Hunt CD, Herbel JL, Nielsen FH. Metabolic responses of postmenopausal women to supplemental dietary boron and aluminum during usual and low magnesium intake: boron, calcium, and magnesium absorption and retention and blood mineral concentrations. *Am J Clin Nutr* 1997;65:803-813.
26. Moseman RF. Chemical disposition of boron in animals and humans. *Environ Health Perspect* 1994;102 Suppl 7:113-117.
27. Meacham SL, Taper LJ, Volpe SL. Effects of boron supplementation on bone mineral density and dietary, blood, and urinary calcium, phosphorus, magnesium, and boron in female athletes. *Environ Health Perspect* 1994;102 Suppl 7:79-82.
28. Nielsen FH, Shuler TR, Zimmerman TJ, Uthus EO. Magnesium and methionine deprivation affect the response of rats to boron deprivation. *Biol Trace Elem Res* 1988;17:91-107.

## Citations and Reference Literature: Boron

29. Ralston NVC, Hunt CD. Biological boron interactions: charge and structure characteristics required for Boroester formation with biomolecules. *FASEB J* 2000;14:A538.
30. Pinto J, Huang YP, McConnell RJ, Rivlin RS. Increased urinary riboflavin excretion resulting from boric acid ingestion. *J Lab Clin Med* 1978;92:126-134.
31. Hunt CD. The biochemical effects of physiologic amounts of dietary boron in animal nutrition models. *Environ Health Perspect* 1994;102 Suppl 7:35-43.
32. Hunt CD, Herbel JL, Idso JP. Dietary boron modifies the effects of vitamin D<sub>3</sub> nutrition on indices of energy substrate utilization and mineral metabolism in the chick. *J Bone Miner Res* 1994;9:171-182.
33. Dupre JN, Keenan MJ, Hegsted M, Brudevold AM. Effects of dietary boron in rats fed a vitamin D-deficient diet. *Environ Health Perspect* 1994;102 Suppl 7:55-58.

## Reference Literature

- Banner W Jr, Koch M, Capin DM, et al. Experimental chelation therapy in chromium, lead, and boron intoxication with N-acetylcysteine and other compounds. *Toxicol Appl Pharmacol* 1986;83:142-147.
- Barr RD, Barton SA, Schull WJ. Boron levels in man: preliminary evidence of genetic regulation and some implications for human biology. *Med Hypotheses* 1996;46:286-289.
- Beattie JH, Peace HS. The influence of a low boron-diet and boron supplementation on bone, major mineral and sex steroid metabolism in postmenopausal women. *Br J Nutr* 1993;69:871-884.
- Benderdour M, Bui-Van T, Dicko A, et al. In vivo and in vitro effects of boron and boronated compounds. *J Trace Elem Med Biol* 1998;12:2-7.
- Chapin RE, Ku WW. The reproductive toxicity of boric acid. *Environ Health Perspect* 1994;102(Suppl 7):87-91.
- Chapin RE, Ku WW, Kenny MA, et al. The effects of dietary boron on bone strength in rats. *Fundam Appl Toxicol* 1997;35:205-215.
- Chlebowski RT, Wactawski-Wende J, Ritenbaugh C, et al. Estrogen plus progestin and colorectal cancer in postmenopausal women. *N Engl J Med* 2004;350(10):991-1004.
- de Fabio A. Treatment and prevention of osteoarthritis. *Townsend Lett Doctors* 1990;143-148.
- Dupre JN, Keenan MJ, Hegsted M, et al. Effects of dietary boron in rats fed a vitamin D-deficient diet. *Environ Health Perspect* 1994;102(Suppl 7):55-58.
- Endo Y, Yamamoto K, Kagechika H. Utility of boron clusters for drug design: relation between estrogen receptor binding affinity and hydrophobicity of phenols bearing various types of carboranyl groups. *Bioorg Med Chem Lett* 2003;13(22):4089-4092.
- Espeland MA, Rapp SR, Shumaker SA, et al. Conjugated equine estrogens and global cognitive function in postmenopausal women: Women's Health Initiative Memory Study. *JAMA* 2004;291:2959-2968.
- Ferrando AA, Green NR. The effect of boron supplementation on lean body mass, plasma testosterone levels, and strength in male bodybuilders. *Int J Sport Nutr* 1993;3:140-149.
- Garabrant DH, Bernstein L, Peters JM, et al. Respiratory and eye irritation from boron oxide and boric acid dusts. *J Occup Med* 1984;26:584-586.
- Green NR, Ferrando AA. Plasma boron and the effects of boron supplementation in males. *Environ Health Perspect* 1994;102(Suppl 7):73-77.
- Groff, J. Advanced nutrition and human metabolism, 2nd ed. St Paul, MN: West Publishing Company;1995.
- Hegsted M, Keenan MJ, Siver F, et al: Effect of boron on vitamin D deficient rats. *Biol Trace Elel Res* 1991;28:243-255.
- Hu H, Penn SG, Lebrilla CB, et al. Isolation and characterization of soluble boron complexes in higher plants: the mechanism of phloem mobility of boron. *Plant Physiol* 1997;113:649-655.
- Hunt CD. Regulation of enzymatic activity: one possible role of dietary boron in higher animals and humans. *Biol Trace Elel Res* 1998;66(1-3):205-225. (Review)
- Hunt CD. The biochemical effects of physiologic amounts of dietary boron in animal nutrition models. *Environ Health Perspect* 1994;102(Suppl 7):35-43. (Review)
- Hunt CD, Herbel JL. Boron affects energy metabolism in the streptozotocin-injected, vitamin D<sub>3</sub>-deprived rat. *Magnes Trace Elel* 1991-92;10:374-386.
- Hunt CD, Idso JP. Dietary boron and erythritol and antigen injection interact to modify blood concentrations of Nk cells and expression of Cd45rc on Cd4 and Cd8a T cells in rats. Abstract 834.5. Experimental Biology 2001 Meeting. Orlando, FL, Mar 31, 2001.
- Hunt CD, Idso JP, Keehr KA. Dietary boron alleviates adjuvant-induced arthritis (AIA) and changes in the blood concentrations of neutrophil, CD8a, and natural killer cells in rats. *FASEB J* 1999;13:A545.

## Citations and Reference Literature: Boron

- Hunt CD, Shuler TR, Mullen LM. Concentration of boron and other elements in human foods and personal-care products. *J Am Diet Assoc* 1991;91:558-568.
- Jansen JA, Andersen J, Schou JS. Boric acid single dose pharmacokinetics after intravenous administration to man. *Arch Toxicol* 1984;55(1):64-67.
- Kelly GS. Boron: a review of its nutritional interactions and therapeutic uses. *Altern Med Rev* 1997;2:48-56. (Review)
- Kreider RB. Dietary supplements and the promotion of muscle growth with resistance exercise. *Sports Med* 1999;27:97-110.
- Linden CH, Hall AH, Kulig KW, et al. Acute ingestions of boric acid. *J Toxicol Clin Toxicol* 1986;24:269-279.
- Locatelli C, Minoia C, Tonini M, et al. Human toxicology of boron with special reference to boric acid poisoning. *G Ital Med Lav* 1987;9:141-146.
- Loomis WD, Durst RW. Chemistry and biology of boron. *BioFactors* 1992;3:229-239.
- Marriott LK, Hauss-Wegrzyniak B, Benton RS, et al. Long-term estrogen therapy worsens the behavioral and neuropathological consequences of chronic brain inflammation. *Behav Neurosci* 2002;116(5):902-911.
- McCoy H, Kenney MA, Montgomery C, et al. Relation of boron to the composition and mechanical properties of bone. *Environ Health Perspect* 1994;102(Suppl 7):49-53.
- Meacham SL, Taper LJ, Volpe SL. Effect of boron supplementation on blood and urinary calcium, magnesium, and phosphorus, and urinary boron in athletic and sedentary women. *Am J Clin Nutr* 1995;61:341-345.
- Minoia C, Gregotti C, Di Nucci A, et al. Toxicology and health impact of environmental exposure to boron: a review. *G Ital Med Lav* 1987;9:119-124.
- Moore JA. An assessment of boric acid and borax using the IEHR evaluative process for assessing human developmental and reproductive toxicity of agents. *Reproduct Toxicol* 1997;11:123-160.
- Moseman RF. Chemical disposition of boron in animals and humans. *Environ Health Perspect* 1994;102(Suppl 7):113-117.
- Murray FJ. A comparative review of the pharmacokinetics of boric acid in rodents and humans. *Biol Trace Elem Res* 1998; 66:331-341.
- Murray FJ. A human health assessment of boron (boric acid and borax) in drinking water. *Regul Toxicol Pharmacol* 1995; 22:221-230.
- Naghii MR. The significance of dietary boron, with particular reference to athletes. *Nutr Health* 1999;13:31-37.
- Naghii MR, Samman S. The effect of boron supplementation on its urinary excretion and selected cardiovascular risk factors in healthy male subjects. *Biol Trace Elem Res* 1997;56:273-286.
- Naghii MR, Samman S. The role of boron in nutrition and metabolism. *Prog Food Nutr Sci* 1993;17:331-349.
- Newnham RE. Agricultural practices affect arthritis. *Nutr Health* 1991;7(2):89-100. PMID:1645463.
- Newnham RE. Arthritis or skeletal fluorosis and boron. *Int Clin Nutr Rev* 1991;11(2):68-70.
- Newnham R. Discovering the cure for arthritis. *Nutr Health* 2004;17(4):281-284. (Case report)
- Newnham RE. Essentiality of boron for healthy bones and joints. *Environ Health Perspect* 1994;102(Suppl 7):83-85.
- Nielsen FH. Biochemical and physiologic consequences of boron deprivation in humans. *Environ Health Perspect* 1994;102(Suppl 7): 59-63.
- Nielsen FH. Boron: an overlooked element of potential nutritional importance. *Nutr Today* 1988;23:4-7.
- Nielsen FH. Facts and fallacies about boron. *Nutr Today* 1992;27:6-12.
- Nielsen FH. Studies on the relationship between boron and magnesium which possibly affects the formation and maintenance of bones. *Magnes Trace Elem* 1990;9(2):61-69. (Review)
- Nielsen FH. The justification for providing dietary guidance for the nutritional intake of boron. *Biol Trace Elem Res* 1998;66(1-3): 319-330. (Review)
- Nielsen FH. Ultratrace minerals in modern nutrition in health and disease. In: Shils ME, Olson JA, Shike M, eds. *Modern nutrition in health and disease*. 9th ed. Baltimore: Williams & Wilkins; 1999:283-303. (Review)
- Nielsen FH, Gallagher SK, Johnson JK, et al. Boron enhances and mimics some effects of estrogen therapy in postmenopausal women. *J Trace Elem Exp Med* 1992;5:237-246.
- Nielsen FH, Mullen LM, Nielsen EJ. Dietary boron affects blood cell counts and hemoglobin concentrations in humans. *J Trace Elem Exp Med* 1991;4:211-223.
- Nielsen FH, Shuler TR. Studies of the interaction between boron and calcium, and its modification by magnesium and potassium, in rats: effects on growth, blood variables, and bone mineral composition. *Biol Trace Elem Res* 1992;35(3):225-237.
- Nielsen FH, Shuler TR, Zimmerman TJ, Uthus EO. Dietary magnesium, manganese and boron affect the response of rats to high dietary aluminum. *Magnesium* 1988;7(3):133-147.
- Panel on Micronutrients, Subcommittees on Upper Reference Levels of Nutrients and of Interpretation and Use of Dietary Reference Intakes, and the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board. *Dietary*

## Citations and Reference Literature: Boron

- reference intakes for vitamin a, vitamin k, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. Washington, DC: National Academy Press; 2001:404-412.
- Penland JG. Dietary boron, brain function, and cognitive performance. *Environ Health Perspect* 1994;102(Suppl 7):65-72.
- Penland JG. The importance of boron nutrition for brain and psychological function. *Biol Trace Elem Res* 1998;66(1-3):299-317. (Review)
- Rainey C, Nyquist L. Multicountry estimation of dietary boron intake. *Biol Trace Elem Res* 1998;66(1-3):79-86.
- Rainey CJ, Nyquist LA, Christensen RE, et al. Daily boron intake from the American diet. *J Am Diet Assoc* 1999;99(3):335-340. (Review)
- Ralston NVC, Hunt CD. Biological boron interactions: charge and structure characteristics required for Boroester formation with biomolecules. *FASEB J* 2000;14:A538.
- Robinson PD, Groziak MP. A boron-containing estrogen mimic. *Acta Crystallogr C* 1999;55(Pt 10):1701-1704.
- Samman S, Naghii MR, Lyons Wall PM, et al. The nutritional and metabolic effects of boron in humans and animals. *Biol Trace Elem Res* 1998;66:227-235.
- Sheng MH, Taper LJ, Veit H, et al. Dietary boron supplementation enhanced the action of estrogen, but not that of parathyroid hormone, to improve trabecular bone quality in ovariectomized rats. *Biol Trace Elem Res* 2001;82(1-3):109-123.
- Sheng MH, Taper LJ, Veit H, et al. Dietary boron supplementation enhances the effects of estrogen on bone mineral balance in ovariectomized rats. *Biol Trace Elem Res* 2001;81(1):29-45.
- Shumaker SA, Legault C, Kuller L, et al. Conjugated equine estrogens and incidence of probable dementia and mild cognitive impairment in postmenopausal women: Women's Health Initiative Memory Study. *JAMA* 2004;291:2947-2958.
- Shumaker SA, Legault C, Thal L, et al. Estrogen plus progestin and the incidence of dementia and mild cognitive impairment in postmenopausal women: the Women's Health Initiative Memory Study: a randomized controlled trial. *JAMA* 2003;289:2651-2662.
- Sisk DB, Colvin BM, Merrill A, et al. Experimental acute inorganic boron toxicosis in the goat: effects on serum chemistry and CSF biogenic amines. *Vet Hum Toxicol* 1990;32:205-211.
- Strum SB. Boron: maintains bones, joints, neurons and may reduce prostate cancer risk: LE Magazine. 2003. Available at [http://www.lef.org/magazine/mag2003/nov2003\\_report\\_boron\\_01.htm](http://www.lef.org/magazine/mag2003/nov2003_report_boron_01.htm). Accessed October 3, 2003.
- Sweet F. Boron estrogens: synthesis, biochemical and biological testing of estrone and estradiol-17 beta 3-carboranyl methyl ethers. *Steroids* 1981;37(2):223-238.
- Travers RL, Rennie GC, Newnham RE.. Boron and arthritis: the results of a double-blind study. *J Nutr Med* 1990;1:127-132.
- Travers RL, Rennie GC. Clinical trial-boron and arthritis: the results of a double blind pilot study. *Townsend Lett Doctors* 1990;360-362.
- Travers RL, Rennie GC, Newnham RE. Boron and arthritis: the results of a double-blind pilot study. *J Nutr Med* 1990;1:127-132.
- Volpe SL, Taper LJ, Meacham S. The relationship between boron and magnesium status and bone mineral density in the human: a review. *Magnes Res* 1993;6:291-296.