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Choline "adequate intake" level could be inadequate for some

Research conducted by scientists at the University of North Carolina at Chapel Hill suggests that the current recommended adequate intake (AI) for choline, a member of the B complex, may be insufficient to prevent organ dysfunction that can be caused by inadequate levels of the vitamin. The study is the most complete investigation of choline requirements to date and the first to include women. The research was reported in the May issue of the *American Journal of Clinical Nutrition*.

Steven H. Zeisel, of UNC Chapel Hill's School of Public Health and School of Medicine and his colleagues gave 26 men, 16 premenopausal women and 15 postmenopausal women a diet providing the adequate intake of choline of 550 milligrams for ten days, followed by a period of up to 42 days when the participants received less than 50 milligrams of the vitamin per day. Blood markers of organ dysfunction (CPK, AST, ALT, GGT, and LD), homocysteine, and other factors were measured at the beginning of the study and at the end of each dietary phase. Magnetic resonance imaging was used to assess liver fat content at the beginning and end of the choline-replete diet, and after day 21 and 42 of the choline deficient diet.

While 77 percent of the men, 80 percent of the postmenopausal women, and 44 percent of the premenopausal women developed fatty liver or muscle damage during the choline deficient phase, 23 percent of the men had these signs while consuming adequate intake levels of the vitamin. As much as 825 milligrams choline per day was required to reverse organ dysfunction resulting from the choline deficient diet. In all participants, choline deficiency was associated with elevated blood homocysteine levels, which may increase the risk of heart disease.

"Subject characteristics (eg menopausal status) modulated the dietary requirement for choline, and a daily intake at the current AI was not sufficient to prevent organ dysfunction in 19 of the subjects," the authors conclude. Coauthor and UNC Chapel Hill assistant professor Kerry-Ann da Costa, PhD commented, "These study results clearly indicate that some adults, notably men and post-menopausal women, need more choline than is recommended by the current AI. We hope these findings will aid the Institute of Medicine in refining the Dietary Reference Intake (DRI) of this nutrient."

Health Concern

Liver degenerative disease

Steatosis (or fatty liver) is a common finding in biopsy of the human liver. Fatty liver is a condition in which fat accumulates within the liver cells (hepatocytes) without causing any specific symptoms. (Fatty liver is defined as either more than 5% of cells containing fat droplets or total lipid exceeding 5% of liver weight.)

The vitamin B complex is a group of vitamins (B1, thiamine; B2, riboflavin; B3, niacin; B5, pantothenic acid; B6, pyridoxine; and

B12, cyanocobalamin) that differ from each other in structure and the effect they have on the human body. The B vitamins play a vital role in numerous essential activities including enzyme activities (thiamine, riboflavin, niacin, pantothenic acid, pyridoxine). These enzyme activities also have many roles and are involved in the metabolism of carbohydrates and fats; functioning of the nervous and digestive systems; and production of red blood cells. The B vitamins have a synergistic effect with each other (AMA 1989). They are found in large quantities in the human liver as well as in many foods and yeast.

Another of the B complex vitamins is choline, essential for the use of fats in the body. It comprises a large part of acetylcholine (a nerve signal carrier). Choline also stops fats from being deposited in the liver and helps move fats into the cells. Deficiency of choline can lead to degenerative diseases such as cirrhosis with associated conditions such as bleeding, kidney damage, hypertension (high blood pressure), cholesterolemia (high blood levels of cholesterol), atherosclerosis (cholesterol deposits in blood vessels), and arteriosclerosis (hardening of the arteries) (Glanze 1996).

<http://www.lef.org/protocols/prtcl-125.shtml>

Featured Products

Hepatopro

Polyenylphosphatidylcholine (PPC), the major ingredient in HepatoPro, is a soy extract that is listed in the *Physician's Desk Reference of the United States*. PPC helps maintain the fluidity and integrity of cell membranes, which is vital to good health. PPC also helps promote the breakdown of collagen in the liver. Excess collagen can interfere with normal detoxification processes. An accumulating body of research suggests that PPC's health benefits may extend from the liver to the stomach, pancreas, and cardiovascular system.



<http://www.lef.org/newshop/items/item00656.html>

SAMe

SAMe facilitates healthy methylation enzymatic processes and boosts hepatic levels of the critical antioxidant, glutathione. When liver function is compromised, glutathione is depleted, which leads to free radical damage. In addition, SAMe acts as a methyl donor in the synthesis and formation of phosphatidylcholine and L-cysteine, both necessary for maintaining liver health.



<http://www.lef.org/newshop/items/item00358.html>

Blood Test Sale Ends May 31, 2007

Do you know the current state of your health? Eating healthy, exercising, and supplementing with the appropriate nutrients is only half the strategy needed to reach optimal health. Only regular blood testing can help provide a complete picture of your current health status. Blood tests can alert you to potential problems in their early stages when they can be managed most effectively.

From cardiovascular risk factors to blood sugar levels, liver and kidney function, immune system wellness, and optimal hormone balance, regular testing is an invaluable diagnostic tool for your body.

Now is the perfect time to take steps to help prevent future disease and achieve ultimate health. During Life Extension's annual **Blood Test Super Sale**, members save up to **80%** compared to the retail prices charged by commercial blood testing labs.

<http://www.lef.org/bloodtest/index.html>

If you have questions or comments concerning this issue or past issues of *Life Extension Update*, send them to ddye@lifeextension.com or call 954 202 7716.

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