

Too Many Carbs May Spoil Eyesight

A look at the eye health of 417 women aged 53 to 73 and with no history of cataracts seems to link high dietary carbohydrate intake to development of eye lens opacity, or cataract. About 20 million Americans older than 40 develop cataracts—the leading cause of blindness worldwide. The analysis was part of the Nutrition and Vision Project, a substudy of the federally funded Nurses' Health Study, in which the volunteers are participants.

The researchers conducted eye exams and studied dietary intake data from questionnaires designed to assess the possible relationship between volunteers' newly diagnosed cataracts and their average carbohydrate intake over a 14-year period. Those women whose average carbohydrate levels were between 200 and 268 grams (g) per day were 2.5 times more likely to develop cortical cataracts than those whose intakes averaged between 101 and 185 g per day. The current recommended dietary allowance, based on how much glucose the brain needs, is 130 g for both adults and children. *Allen Taylor, USDA-ARS Laboratory for Nutrition and Vision Research, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts; phone (617) 556-3155, e-mail allen.taylor@tufts.edu.*

Boost for Trout Producers

Who wouldn't like to have more and better trout available in fish markets across the country? There's heavy consumer demand for this mild-flavored fish, especially for 8- to 10-ounce fillets. Thus, the marketable size of trout has increased from 1 pound to almost 2, and it's continuing to increase. What's a fish farmer to do?

Research has shown that trout with three chromosome sets grow faster than fish with two sets because they're unable to reproduce. Since the food energy otherwise needed for reproduction becomes available just for growth, producers are eager to have stocks of these fish available.

One of the most reliable ways to get them is to crossbreed fish with four sets of chromosomes with typical fish that have two sets. To obtain rainbow trout with four sets, scientists are fine-tuning a procedure for exposing fish embryos to defined amounts of pressure at precisely the right time during very early development. Mating those fish, when mature, with fish with two sets of chromosomes produces offspring with three sets. Since these are sterile, they can't mate with indigenous stocks. This protects native germplasm and helps ensure environmental security while improving profits for rainbow trout producers. *William K. Hershberger, USDA-ARS National Center for Cool and Cold Water Aquaculture, Kearneysville, West Virginia; phone (304) 724-8340, e-mail bhershbe@nccwa.ars.usda.gov.*

Score One for Anammox

Researchers have, for the first time, isolated from animal wastewater the planctomycetes bacteria that power the anaerobic ammonium oxidation process called "anammox." Discovered in the Netherlands in the 1990s, anammox converts nitrite and ammonium to harmless nitrogen gas. The process is more energy efficient than conventional biological nitrogen-removal systems because only part of the ammonium in wastewater needs to be nitrified. With anammox, scientists have been able to remove nitrogen from wastewater at industrial rates similar to those obtained using conventional methods. They achieved them by improving the bacteria's growth environment, using cell immobilization techniques to compensate for the bacteria's usual slow multiplication.

Isolation of these planctomycetes bacteria from wastewater during these tests may make possible economical treatments for high-ammonia effluents because it shows that the bacteria may not need to be cultivated off-site. The researchers are now involved in a cooperative 3-year project with Brazil's agricultural research agency, EMBRAPA, to develop a cost-

effective, new-generation, anammox-based treatment for livestock wastewater. If successful, the procedure could reduce nitrogen-treatment costs fourfold. *Matias B. Vanotti and Ariel A. Szogi, USDA-ARS Coastal Plains Soil, Water, and Plant Research Center, Florence, South Carolina; phone (843) 669-5203, e-mail vanotti@florence.ars.usda.gov, szogi@florence.ars.usda.gov.*

Whole-Grain Plaque Fighters

Atherosclerotic plaque forms when fatty substances in blood plasma build up inside artery walls. This causes stenosis—narrowing of the diameter of arterial passageways—that interrupts normal blood flow. The dietary intake of whole grains has been associated with decreased plasma cholesterol levels and lowered risk of developing heart disease. To see whether there was a relationship between whole-grain intake and actual plaque buildup, researchers studied 229 postmenopausal women with a history of heart disease who had taken part in a study on estrogen replacement and atherosclerosis.

Dietary intake questionnaires and angiograms were used to assess whole-grain intake and changes in the volunteers' coronary artery diameters over a 3-year period. Also taken into account was the frequency of dietary intake of fats, cholesterol, essential nutrients, and alcohol. The progression of stenosis proved to be less in women reporting higher intakes of cereal fiber from whole-grain foods than in those reporting lower ones.

This suggests that consuming the recommended three servings or more of whole-grain foods each day could help slow the rate of heart disease progression. Good sources include breads and breakfast cereal made with whole grains, oatmeal, brown rice, barley, popcorn, bran muffins, and whole-wheat flour. *Alice H. Lichtenstein, USDA Jean Mayer Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts; phone (617) 556-3127, e-mail alice.lichtenstein@tufts.edu.*