Nutrition

Janet Raloff reports from Washington, D.C., at Experimental Biology '96

A couple of heart-friendly dark brews

Alcohol consumption can reduce heart disease risk, according to a variety of studies (SN: 3/30/96, p. 197). Will any type of alcohol do? Yes, but for persons with coronary artery disease, dark beer may be particularly effective. People may get as much benefit from drinking two glasses of dark beer as from 12 servings of uncolored alcoholic drinks, a new study finds. But you're a teetotaler? No problem. Two cups of tea a day provide the same benefits—at least in dogs.

For years, John D. Folts of the University of Wisconsin-Madison has been testing the ability of various agents to reduce the stickiness of blood platelets. To mimic human atherosclerosis, he uses dogs whose coronary arteries have been artificially damaged and constricted by 60 to 80 percent. Under the influence of stress, cigarette smoking, or various diseases, platelets periodically become activated, turning sticky and forming clumps. At such times, they tend to lodge in narrowed vessels, posing a risk of heart attack or stroke.

Last year, Folts showed that red wine and red grape juice, both rich in pigmented antioxidants known as flavonoids, inhibited platelet activation, while flavonoid-shy white grape juice did not. Now, Folts and his colleagues have tested several other commonly consumed flavonoid-rich beverages.

In one study, they delivered Guinness Extra stout, a dark, malty brew, directly into the stomachs of 11 animals. Another 5 received Heineken lager, a light-colored beer possessing fewer flavonoids. Chemically induced platelet clogs disappeared in all animals given dark beer and did not recur, even when the dogs were again challenged with a platelet-activating compound. Platelet clogs persisted in dogs receiving the lager but fell from an initial average of about seven per dog to roughly four.

In a companion study, the equivalent of two cups of tea eliminated platelet clogs in dogs as efficiently as dark beer did. This result supports studies that have linked reduced heart attack rates in humans to tea drinking (SN: 10/30/93, p. 278). Coffee appeared to aggravate clogging in Folts' canine study.

Other studies by the group suggest that flavonoids may bind to circulating platelets, eventually making a given amount more effective. Indeed, Folts points out, after 7 days of tea consumption, only half as much is needed to prevent platelet blockages.

Vitamin E slows artery 'aging'

Vitamin E appears to be as effective at slowing the accumulation of artery-clogging plaque as smoking is at fostering it, according to the first year of data from a 5-year study of heart risks by researchers at the University of Southern California School of Medicine in Los Angeles.

The new study correlates the thickness of the inner two layers of a 1-centimeter length of the carotid artery—a gauge of atherosclerotic narrowing—with diet, exercise, age, weight, body fat, smoking, and other risk factors for heart disease in 32 men and 24 women between the ages of 38 and 60.

To date, one of the most striking observations "is an amazingly strong effect of vitamin E," notes Lisa Nicholson, a nutritionist with the study. Participants who have been taking supplements of the vitamin—on average, about 100 international units per day, or 10 times the recommended daily allowance—exhibit far less plaque buildup than would have been expected on the basis of their age and other factors. Indeed, she says, the supplements appear to have reduced plaque buildup by an amount "equivalent to about 14 years of aging."

Even participants who did not take supplements but who ate foods naturally rich in vitamin E showed dose-related reductions in artery narrowing. These preliminary findings dovetail with results from a trial reported in the March 23 LANCET showing that people with atherosclerosis who took vitamin E supplements for 17 months experienced fewer heart attacks and a lower incidence of death from heart disease.

High-fat diets help athletes perform

Marathon runners and other highly trained endurance athletes appear to perform better after consuming a high-fat diet for several weeks than after eating their customary carbohydrate-rich, low-fat meals, a new study reveals.

Peter J. Horvath and his colleagues at the State University of New York at Buffalo tailored a trio of diets for 25 competitive runners 18 to 53 years old who trained at least 40 miles each week. Each 4-week-long diet aimed to provide the same total energy, but fat contributed just 16 percent of calories in one diet, 30 percent of calories in the second (the recommended amount for most people today), and a full 45 percent of calories in the last. Each athlete cycled through all three diets, but 13 runners failed to comply fully with the third regimen, complaining that it was too fatty, even though they gained no weight.

After completing a 4-week diet, each athlete performed a series of exercise tests. At the end of the two fattier diets, the athletes increased the amount of time they could run at peak capacity by an average of 7 percent—or about 30 seconds. Overall endurance increased 14 percent, and exercise-induced muscle fatigue decreased. Moreover, the study found that runners who consumed the fattiest diet used their stored energy more efficiently than they did when on the lowest-fat diet.

The body takes weeks to adjust to the new diets—changing where fat is stored as well as how accessible it is for fueling exercise. Horvath suspects that a failure to wait for such changes may explain why earlier studies, often just a few days long, missed the performance advantages of higher-fat diets.

Jaya T. Venkatraman, also at Buffalo, found that the athletes' immune systems responded better after the higher-fat diets, increasing their production of germ-fighting white blood cells and reducing their generation of inflammatory agents.

Juicy anticancer prospects

While using various juices to hide the taste of a test substance given to patients along with their drugs as part of a cancer trial, researchers at the University of Western Ontario in London noticed that the drugs seemed far more effective when the patients drank grapefruit juice.

The observation spurred Kenneth K. Carroll, director of the university's Centre for Human Nutrition, to explore why. He and his colleagues now report that certain fruit-derived flavonoids seem especially potent at halting the growth of cancer cells.

When administered to test-tube cultures of estrogen-insensitive human breast cancer cells, naringenin, a flavonoid in grapefruit juice, proved almost eight times more potent at halting the cells' growth than genestein, an estrogenlike flavonoid in soy that shows promise as a natural anticancer agent. Naringenin proved far less effective than genestein, however, at slowing the growth of breast cancer cells that depend on estrogen for growth.

The researchers proceeded to test other fruits. Individually, the best performers against both types of cells were tangeretin and nobiletin, a pair of flavonoids from tangerines. Each was about 250 times more potent than genestein in estrogen-insensitive cells and five to nine times more potent in estrogen-dependent cancer cells. Delivered together or with certain other fruit flavonoids, they proved still more potent. They also appeared to increase the efficacy of tamoxifen, the leading drug for halting breast cancer recurrence.

Orange juice outperformed grapefruit juice in two trials using rats. In cell tests, however, grapefruit's naringenin outperformed an orange-derived flavonoid, hesperetin. Carroll now plans to study the cancer-inhibiting effects of oranges—and perhaps tangerines—in mice injected with human cancer cells.