

Wretched excess yields double trouble

Holiday gatherings can bring about marathon eating sessions. Some scientists' advice: Put down the fork.

New research indicates that a large intake of fatty food in one sitting puts enough strain on the cardiovascular system to impair its function. Another study finds that downing a high-fat meal can boost the risk of blood clots.

For 4 hours after a high-fat meal, the body's arteries struggle to let blood flow through them in response to stress, researchers from the University of Maryland School of Medicine in Baltimore report in the Nov. 26 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*.

Impaired vessel function is typically a precursor of atherosclerosis, in which fatty plaques form on the walls of arteries. To test the function of the inner wall of an arm artery in 20 healthy men and women, the scientists strapped a blood pressure cuff around the top of each volunteer's arm, restricted blood flow for 5 minutes, then released the cuff. One minute later, they measured artery size using ultrasound. Normally, the vessel enlarges as

the body tries to nourish areas that have been deprived.

In people who hadn't eaten recently, the induced stress enlarged the blood vessel by 20 percent. But in people tested 2 hours after eating a fast-food meal of eggs, sausage, biscuits, and hash brown potatoes, the blood vessel dilated only 12 percent. The dilation response continued to fall for the next 2 hours before improving, says cardiologist and study coauthor Gary D. Plotnick.

After a low-fat meal, the vessels dilated normally. People who took vitamins E and C with their fatty meals also showed normal vessel enlargement.

Dilation depends in part on nitric oxide, which is released from the lining of blood vessels and stimulates the smooth muscle of vessel walls. After high-fat meals, fatty substances unleash free radicals and other oxidants. These molecular fragments are thought to deactivate nitric oxide, thus hindering vessel expansion. The antioxidant vitamins C and E, which sop up free radicals, may offset the effects of the fatty meal.

Continents growing wetter as globe warms

A study of global precipitation records going back to 1900 shows that the United States and other land areas in the midlatitudes have grown wetter, whereas the tropics have generally dried out, reports Aiguo Dai of the National Center for Atmospheric Research in Boulder, Colo. Such changes offer a taste of the kinds of precipitation shifts predicted to accompany greenhouse warming, the researchers say.

Rain and snow patterns profoundly influence social well-being by controlling factors ranging from food production to the frequency of floods. Concern about the potential for changes in precipitation underlie the international climate treaty negotiations taking place next week in Kyoto, Japan.

"Precipitation is what we really need to address. A lot of natural disasters are related more to precipitation than to temperature," says Inez Y. Fung of the University of Victoria, British Columbia. Dai, Fung, and Anthony D. Del Genio of NASA's Goddard Institute for Space Studies in New York report their findings in the November *JOURNAL OF CLIMATE*.

Dai and his colleagues examined monthly precipitation records from 5,328 meteorological stations for the period 1900 through 1988. Using a statistical technique that teases out independent patterns in the data, they minimized errors introduced when instruments were changed or stations moved.

"This is by far the most comprehensive compilation of precipitation data. It is a much larger and cleaner data set

than has existed before," says Fung.

On a global average, precipitation onto land areas increased through the first half of the century but has decreased since the mid-1970s, resulting in a small net gain. Much of the recent drop comes from a prolonged dry period in the Sahel region just south of the Sahara Desert.

The biggest increases have occurred in mid- and high-latitude areas, such as North America, northern Eurasia, Australia, and Argentina. Over the same period, the Philippines, Malaysia, and the Mediterranean lands have dried out.

This pattern matches the general picture emerging from computer climate models, say the researchers. In simulations of greenhouse warming, increased air temperatures cause more water to evaporate from Earth's surface. In the tropics, much of this additional moisture remains in the atmosphere because warmer air can more readily hold extra water vapor. In the middle and high latitudes, the vapor-storing capacity of the atmosphere also rises but not enough to hold most of the additional moisture, which drops as precipitation.

Despite the broad agreement between models and observations, Henry F. Diaz of the National Oceanic and Atmospheric Administration in Boulder cautions against concluding that greenhouse gases have caused this century's precipitation changes.

In fact, he notes, early models called for greenhouse warming to increase the frequency of midcontinent droughts in North America, whereas U.S. data show an increase in precipitation. —R. Monastersky



"This is another piece of the puzzle on the value of vitamins," Plotnick says.

High-fat meals may also lead to clots in the bloodstream, possibly hiking the risk of heart attack or stroke in some people, Danish researchers report in the November *ARTERIOSCLEROSIS, THROMBOSIS, AND VASCULAR BIOLOGY*.

Over 9 months, 18 healthy young men were given six test meals, each on an empty stomach. Five were high-fat meals that included one of five cooking oils—palm, sunflower, olive, canola, or butter—while the sixth meal was low-fat. After each repast, researchers measured concentrations of coagulation factor VII (FVII), a protein that triggers production of a clotting agent in the blood.

The amount of FVII in its activated form rose roughly 60 percent after each of the high-fat meals but not after the low-fat meal. Surprisingly, even meals prepared with the monounsaturated fats—canola and olive oils—boosted concentrations of these clotting factors, says Lone Frost Larsen, a biologist at the Royal Veterinary and Agricultural University in Frederiksberg.

High-fat meals carry the risk of creating a blockage that might lead to heart attack or stroke in some people, she says. "I was not afraid that my healthy young subjects would have a heart attack," Larsen says. "However, it might be suggested that in subjects who already have increased levels of FVII, [its] acute activation may be fatal."

Some other studies have linked a high incidence of heart disease only to diets rich in palm oil and butter. Danes eat a lot of saturated fats, Larsen acknowledges, and the test's low-fat meal had more fiber, possibly skewing the results.

Nonetheless, both studies "are very interesting [and] potentially useful as models for disease," says Garret A. FitzGerald, a cardiovascular pharmacologist at the University of Pennsylvania in Philadelphia. To explore the implications of the Baltimore study, he notes, researchers need to study people who have diets consistently high in fat and who may have latent vascular disease. Only then will scientists understand how an acute dose of fat translates into actual risk and how it might be modified by diet or vitamins, he says. —N. Seppa