

Dietary Fat: No Link to Breast Cancer

Fat, the stuff that makes ice cream creamy and hamburgers juicy, now seems exonerated as a health risk for breast cancer. A new study finds no link between dietary fat and the incidence of breast malignancies.

Before rushing out to order a cheeseburger, however, consider this: Experts still say a high-fat diet heightens the risk of colon cancer, coronary artery disease, and a variety of other ills.

"The major finding of the study is that we did not observe any positive association between dietary fat intake and breast cancer," says study coauthor David J. Hunter of the Harvard School of Public Health and Brigham and Women's Hospital in Boston. Nonetheless, he says, "there are other good reasons to reduce fat intake, such as reducing the risk of heart disease."

The new results come from the ongoing Nurses' Health Study, a large trial of more than 121,000 female registered nurses that began in 1976. Hunter and his colleagues set out to test the long-standing theory that high-fat diets put a woman in jeopardy of developing breast cancer. Although an earlier analysis of the Nurses' Health Study found no link between dietary fat and breast cancer, other studies had suggested an association between a fatty diet and the risk of the malignancy, Hunter points out.

Hunter, Walter C. Willett, who is also at the Harvard School of Public Health, and their colleagues studied 89,494 women who had participated in the Nurses' Health Study since 1980. None had breast cancer at this study's start. The researchers asked the women to answer dietary questionnaires designed to gauge the amount of fat they consumed each day. The team then followed the women for eight years, recording the number of breast cancer cases that developed during that time. They found 1,439 cases of breast cancer, according to their report published in the Oct. 21 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*.

After controlling for age and other risk factors, the researchers conducted a statistical analysis of the data. The analysis revealed no association between dietary fat and the risk of breast cancer, Hunter says. It also revealed no link between breast cancer and the amount of fiber consumed. Fiber, the roughage in fruits and vegetables, has been thought to protect against breast cancer.

While fat and fiber may not bear any relationship to breast cancer, the Harvard scientists note that a low-fat, high-fiber diet may protect against cancer of the colon. Indeed, a previous analysis of data from the Nurses' Health Study demon-

strated a connection between a fatty diet and the incidence of colon cancer, Hunter points out.

Does this new report settle the dietary fat and breast cancer debate?

The Nurses' Health Study offers scientists the most comprehensive and careful study of diet and breast cancer yet, comments Barbara S. Hulka of the University of North Carolina at Chapel Hill. The Harvard researchers, she notes, looked at data collected on more than 1,400 breast cancer cases. Such a large data base argues against findings that can be ascribed to chance, she says.

Geoffrey R. Howe at the University of Toronto isn't convinced. He believes there may be some link, albeit weak, between a high-fat diet and breast cancer. If so, women who follow a low-fat diet might gain some breast cancer protection. That strategy could significantly reduce the incidence of breast cancer, Howe maintains. In an editorial accompanying the new research report, he notes that a risk reduction of even 10 percent would lower the number of U.S. breast cancer cases by

about 18,000 each year.

The new findings may provide support for scientists who question the merits of a federal study on dietary fat and breast cancer. The National Institutes of Health trial, called the Women's Health Initiative, will cost more than \$500 million. Although still in the planning stages, the NIH trial is based in part on the dietary fat/breast cancer theory — a link the Nurses' Study discounts, Hunter and Willett point out. In addition, Willett says, a flaw in the trial's design makes it impossible to tell whether dietary fat or some other factor, such as vitamin consumption, influences breast cancer risk.

Hulka points out that the Women's Health Initiative will also study other health problems affecting women, including heart disease and the crippling bone disease osteoporosis. Nonetheless, she urges NIH to reconsider the study design in light of the new data indicating that dietary fat plays no role in breast cancer. "I believe they're going to have to consider this very carefully," she says.

— K.A. Fackelmann

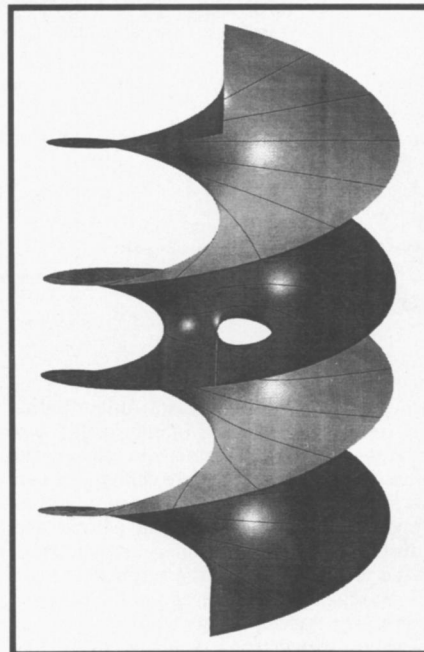
Putting a handle on a minimal helicoid

The helicoid, resembling a spiral slide of infinite length, serves as an example of a minimal surface. Like a glistening soap film stretched across a wire frame, this figure's surface covers the least possible area within the helix defining its edge.

For centuries, the helicoid has been the only known example of a so-called "complete embedded minimal surface of finite topology with infinite total curvature." Roughly speaking, this means that the surface has no boundary and doesn't fold back to intersect itself. At the same time in the strange, rubbery world of topology, it's possible to imagine creating a helicoid by carefully deforming and stretching out the surface of a sphere punctured by a hole. The hole's rim becomes the helicoid's helical edge.

Now mathematicians have discovered a new minimal surface (pictured here) having the same basic properties as the helicoid. The novel surface incorporates what topologists call a handle. This feature, which looks like a hole in the fundamental helicoid shape, makes the new surface topologically equivalent to a punctured sphere equipped with a handle — just like the one that sprouts from a mug.

The finding, made by David Hoffman and Fusheng Wei of the University of Massachusetts at Amherst and Hermann Karcher of the University of Bonn in Germany, is the latest in a series of discoveries that have greatly expanded the number of known examples of minimal surfaces of various types (SN: 3/16/85, p. 168; 9/3/88, p. 151). Hoffman described the new helicoid surface at a workshop on the visualization of geometric structures, held last week at the Mathematical Sciences Research Institute in Berkeley, Calif.



Hoffman et al.