
Curing bacon: Fat on the fire

British researchers have come up with an unexpected twist to the relationship between nitrates, nitrites and stomach cancer. In a study comparing people from an area where the incidence of stomach cancer is high to people in low-risk areas, they found evidence that the high-risk group had lower levels of nitrates and nitrites in their bodies. The finding, supporting exoneration of the nitrates and nitrites found in food and water, is another chapter — certainly not the final one — in the increasingly intricate story of stomach cancer.

In a chemical double play, bacteria in the mouth and stomach can reduce nitrate to nitrite, a substance that can cause mutation in bacteria. Nitrites can react with other compounds in the laboratory to form N-nitroso compounds, including nitrosamines, which are known to cause cancer in animals.

In the lab, the progression to N-nitroso compounds is cut and dried. But what happens in the body may be a different story. While the National Research Council (NRC) recommended in 1981 that people limit their exposure to nitrates and nitrites, the matter has remained controversial (SN: 12/19 & 26/81, p. 390). Producers of cured meats such as bacon have cut down on levels of nitrites, which inhibit deadly botulism-producing bacteria. Critics contend, though, that the reduction wasn't needed because the levels weren't harmful and in any case represented only a portion of a person's total intake, since vegetables and drinking water contain nitrates and nitrites.

In the current study, David Forman, Samim Al-Dabbagh and Richard Doll of the Imperial Cancer Research Fund in Oxford looked at 414 people from parts of Wales and northeast England where stomach cancer is high, and 422 people from low-incidence areas of Oxford and southeast England. To estimate the amount of nitrates and nitrites in the body, they measured levels in the saliva.

"Contrary to what might have been expected," they report in the Feb. 21 *NATURE*, "it is always the high-risk population that has the lower concentrations of nitrate and nitrite." Their findings, they say, are "inconsistent with the notion that nitrate exposure is a risk factor for cancer of the stomach."

While their findings suggest positive implications for nitrates and nitrites, they concede that there may be alternative explanations — some overriding, as-yet-unidentified factor. Or the salivary measurement might not accurately reflect the past or present level of nitrosamines in the stomach, or the effect might be masked by the intake of vitamin C, which inhibits the formation of N-nitroso compounds.

The last two concerns are shared by Sidney S. Mirvish of the University of Nebraska Medical Center in Omaha, an adviser to the NRC panel in 1981. Because of a strong correlation between nitrate consumption and stomach cancer in 13 countries, the relationship remains an attractive theory, he says.

The subject is of considerable interest in farm areas, Mirvish says, where people are worried about increasing levels of nitrates and nitrites from fertilizer use and cattle feedlot runoff.

Peter Greenwald of the National Cancer Institute in Bethesda, Md., who was on the NRC committee, finds the study "valid, but the evidence is indirect and circumstantial.

"I think it's a good study," he says, "well done and by good people. But there's still a question there."

Epidemiological studies of people who move from high-risk to low-risk areas indicate that key factors in stomach cancer occur in childhood, years before the cancer appears, Greenwald notes. People in Japan, for instance, are at unusually high risk of stomach cancer, and remain so when they move to the United States. But their U.S.-born children enjoy lower risk. The answer to the question, then, may lie in a long-term study. In the meantime, Greenwald says, the NRC recommendation to limit nitrate and nitrite intake is still a prudent one. —*J. Silberner*

Drug plugs vessel in babies' hearts

The Food and Drug Administration last week approved a new use for an old drug — intravenous administration of an anti-inflammatory agent to shut down a blood vessel in babies' hearts that sometimes fails to close on its own. The drug, indomethacin, is currently used to treat arthritis.

In the fetus, the artery that runs from the heart to the lungs is connected to the artery that carries blood from the heart to the body, siphoning most blood flow away from the lungs. Normally, this vessel closes within a few days of birth, and blood pumped from the heart goes to the lungs. But in about 16,000 babies (most of them premature) in the United States each year, the vessel doesn't close of its own accord and surgery is performed.

Indomethacin is believed to work by limiting production of chemicals that hold the muscles around the vessel open and relaxed. The drug occasionally causes kidney damage, and, unlike the surgical repair, it is not always successful. Nevertheless, it does avoid the trauma and expense of surgery, says Jean S. Kan, a pediatric cardiologist at Johns Hopkins University in Baltimore, who expects that the drug will become the treatment of choice. —*J. Silberner*

Funding a new life for Superfund

Near the top of the list for action by Congress this year is reauthorization of the "Superfund" law, which provides for the cleaning up of abandoned toxic-waste dumps. The present law expires at the end of September. Last week, the Reagan administration submitted to Congress its proposal for modifying and, in some ways, expanding the current program.

The proposal calls for spending \$5.3 billion over the next five years to clean up toxic-waste sites, compared with \$1.6 billion spent since 1980, when the program started (SN: 2/9/85, p. 86). One-third of the funds would come from a tax on crude oil, various petrochemicals and other raw materials used in the production of chemicals that contribute to the generation of toxic wastes. Two-thirds would come from a new "waste-end" tax collected on hazardous wastes received at treatment, storage or disposal facilities. Although this tax may, as the government suggests, encourage companies to produce lower levels of hazardous wastes, some critics fear that it may also encourage more illegal dumping.

Equally controversial is the administration's decision to ask for an increase from 10 to 20 percent in a state government's share of cleanup costs. However, states would now be allowed to initiate feedstock or waste-end taxes of their own to fund their activities.

The chief question among many congressmen and a variety of environmental groups is whether the federal government's proposal moves far enough fast enough. Last December, the Environmental Protection Agency (EPA) itself estimated that cleaning up the nation's worst abandoned hazardous-waste dumps could eventually cost \$11.7 billion and possibly twice that much. A bill submitted to Congress earlier this year by Sen. Robert T. Stafford (R-Vt.) would raise \$7.5 billion over five years. Last summer, the House passed a bill that authorized expenditures of more than \$10 billion, but because the Senate didn't meet its deadline, no law was enacted before Congress adjourned.

But, says EPA Administrator Lee M. Thomas, going faster would strain the agency's capacity to do its job carefully and effectively. He suggests that the present law already is too sweeping. The administration's proposal would prohibit the use of Superfund for cleaning up, for example, wastes from mining activities or asbestos in buildings, unless the President decides that a major threat to public health exists and no one else can respond soon enough.

"In focusing our attention," says Thomas, "we establish a more concerted effort to clean up what we feel are the most dangerous sites in the nation."

—*I. Peterson*