

## DIOXINS IN SHAMPOOS, SKIN CREAMS AND DRINKS FROM PLASTIC LINED CONTAINERS MAY INCREASE CANCER

### Additional source of dietary 'estrogens'

Many canned foods on supermarket shelves contain small quantities of an estrogenlike pollutant, a new study reports. This hormone-mimicking contaminant bisphenol-A (BPA) - appears to leach from the plastic resins coating the inside of affected cans.

Exposure to estrogen mimics has become a source of growing concern since recent studies began linking these ubiquitous contaminants with increased risks of breast cancer (SN: 7/3/93, p-10) and reproductive abnormalities (SN: 1/22/94, p.56). During the past 4 years, endocrinologists have identified two types of plastics that can shed estrogen-like constituents.

Realizing that many food processors coat cans to avoid flavor-altering chemical reactions between the cans and their contents, Nicolas Olea and his coworkers at the University of Granada in Spain analyzed 20 different brands of canned goods. Purchased locally and in the United States,

these included corn, artichoke hearts, mushrooms, tomatoes, and peas.

BPA turned up in roughly half of the items, the researchers report in the June *ENVIRONMENTAL HEALTH PERSPECTIVES*. Food processors note that about 40 percent of food cans in Spain are lined with plastic, compared to 85 percent in the United States.

Two years ago, David Feldman and Aruna V. Krishnan of Stanford University School of Medicine reported that BPA can leach from plastic subjected to high temperatures, such as those that occur during the autoclaving of laboratory equipment (SN: 7/3/93, p-10). Olea told *SCIENCE NEWS* that the sterilization of canned foods closely resembles that process.

Once plastic has been heated, BPA can continue to leach out. For instance, when a plastic-lined can was washed out and refilled with water, that water soon picked up measurable quantities of BPA, Olea's

team reports. The pH of the food did not appear to affect leaching.

Where present, BPA occurred in trace quantities - just 4 to 22 micrograms per 300 grams of food. That's well below the 3 milligrams per kilogram of BPA allowed under regulations set by the European Union. BPA is also FDA-approved, and "no research or experience has suggested it might cause any adverse effects," says Roger Coleman of the national Food Processors Association in Washington, D.C.

Feldman's studies indicate that BPA possesses only one-thousandth the potency of estradiol, the major estrogen in humans. However, the body breaks down estradiol quickly, notes endocrinologist Ana M Soto of Tufts University School of Medicine in Boston. If BPA lasts longer than estradiol or if the body cannot inactivate BPA as efficiently, "then it might prove more active than it at first sight appeared," she says.

-J. Raloff

### Newest estrogen mimics the commonest?

Phthalates, compounds best known for their ability to make plastics flexible, are the most abundant industrial contaminants in the environment. Two new studies now demonstrate that at least a couple of them possess a hormonal alter ego: they activate receptors for estrogen, the primary female sex hormone.

Both studies also established the estrogenicity of BHA, a preservative commonly added to food to retard rancidity.

In recent years, scientists have been compiling a list of emasculating agents that work by mimicking estrogen. Susan Jobling of Brunel University in Uxbridge, England, and her colleagues collared the three new prospects while assaying 20 common sewage contaminants. They were scouting sources of the estrogenicity that teammate John P. Sumpter had observed in wastes from sewage-treatment plants (SN: 1/8/94, p.24).

Nine of these pollutants bind to estrogen receptors. The researchers incubated cells with each of the nine to see whether any of them triggered the receptor's normal activity. BHA, butyl benzyl phthalate (BBP) and di-n-butyl phthalate (DBP) not only appeared estrogenic, but also stimulated the growth of breast cancer cells in culture, the group reports in the June *ENVIRONMENTAL HEALTH PERSPECTIVES*.

At the same time, researchers at Tufts University School of Medicine in Boston and the University of Granada in Spain were studying some of the same compounds. Their findings, to be published in the same journal later this year, also identify BHA and BBP as estrogens. However, while DBP did not exhibit estrogenicity in their assays, a third plasticizer - diphenyl phthalate - did.

Where does one find phthalates? DBP serves as a dispersant in some insect repellents and appears in plastic plumbing pipes and food wraps. Indeed, the British team cites studies finding up to 500 micrograms of DBP per kilogram of food wrapped in plastic. BBP goes into vinyl floor tiles, adhesives, synthetic leather, and the papers and cardboard designed for contact with liquid, dry, and fatty foods. That last application may explain how butter and margarines end up laced with BBP at concentrations exceeding 45 milligrams per kilogram, as cited in "Male Reproductive Health and Environmental Chemicals with Estrogenic Effects," a new report by the Danish Environmental Protection Agency in Copenhagen.

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## Biomedicine

### Cancer and heart risks of dioxins

Several studies have indicated an apparent increased risk of death from cancer among individuals heavily exposed to dioxins and such close chemical cousins as furans (SN: 9/4/93, p.149). A new study now looks at men who worked at a pesticide plant in Hamburg, Germany, at any time between 1952 and the facility's closing in 1984. It shows that a man's exposure-to dioxins and furans corresponds to a dose-dependent elevation in his risk of dying not only from cancer but also from heart disease - especially clogged arteries.

Dieter Flesch-Janys of Hamburg's Center for Chemical Workers' Health and his colleagues stratified the 1,189 men using estimates of each worker's exposure. They based those values on how long a man had worked (and where in the plant) and, if available, on recorded body concentrations of TCDD --- the most potent dioxin - or its toxic equivalents. They found that plant veterans with the highest exposures faced more than three times the risk of dying from cancer and 2.5 times the risk of dying from ischemic heart disease as workers of similar ages from a nearby gas plant.

"These findings refine the strong existing evidence of a carcinogenic effect of [dioxins and furans] in humans,"\* the researchers conclude in the Dec. 1 AMERICAN JOURNAL OF EPIDEMIOLOGY. The Hamburg team cites three reports that showed hints of a heart disease risk attributable to dioxins. In one of these reports, the investigating epidemiologists had speculated that stress was the likely cause. In their new study, Flesch-Janys and his coworkers note that "there is some evidence from animal models that TCDD may promote atherosclerosis," which "lends credibility to a causal interpretation of our [heart disease] findings."

### NY CONSUMER AFFAIRS COMM. URGES BAN ON SKIN BLEACHES

Because he fears that skin bleach products may be carcinogenic, cause disfiguring skin diseases and are mislabeled, New York's Commissioner of Consumer Affairs Mark Green has urged the FDA to ban the products completely.

Mr. Green wrote FDA Commissioner David Kessler asking him to "act quickly to seize them and then ban 11 skin-bleaching creams that are mostly sold to African-Americans." The products all contain hydroquinone.