Of all the self-fulfilling prophecies in our culture, the assumption that aging means decline and poor health is probably the deadliest.
Marilyn Ferguson, *The Aquarian Conspiracy* (1980)

FOOD SAFETY

Mercury in Japan's Whale Meat

Whale meat and organs have long been featured ingredients in traditional Japanese dishes. Today, the meat and organs of small cetaceans including whale and dolphin are not as widely eaten, but they are readily available ithroughout Japan. Now scientists have discovered dangerously high levels of mercury in cetacean meat products sold as food there.

The Japanese Ministry of Health, Labour, and Welfare has set the safe level of total mercury at 0.4 parts per million (ppm) for marine foods (the U.S. level is set at 1.0 ppm). Each year, Japan allows more than 22,000 small cetaceans to be legally harvested for food around the coast of Japan, although Naoko Funahashi, Japan's representative for the International Fund for Animal Welfare, estimates the actual catch is around 17,000–19,000.

A whale of a problem. Whale meat, though not widely eaten in Japan, is readily available there. Such meat can contain far more mercury than deemed safe by the U.S. and Japanese governments.

Toothed whales—including porpoise, dolphin, and some whale species—are top predators in the sea life food chain. These small cetaceans therefore tend to accumulate higher loads of pollutants such as mercury than do filter feeders such as baleen whales.

"The real health problem is that some dolphin meat is being mislabeled as baleen whale meat," says Naomi A. Rose, a marine-mammal scientist with The Humane Society of the United States, a Washington, D.C.–based nonprofit organization opposed to commercial whaling. Most consumers can't distinguish the red steaks of small cetacean meat from those of baleen whale meat. "Whoever is getting those unlucky packages is getting a lot of contaminants," says Rose. "People are playing Russian roulette."

Between 2000 and 2002, a team of scientists led by Tetsuya Endo, a professor in the Department of Clinical Toxicology and Metabolism at the Health Sciences University of Hokkaido, purchased whale meat samples from markets across the country. The researchers measured total mercury levels and performed genetic analysis to verify the species of each sample. Their findings were published in the 15 June 2003 edition of *Environmental Science & Technology*.

Samples of Dall's porpoise, the most commonly harvested cetacean in Japan, had an average total mercury level of 1.26 ppm, with the highest sample at 2.51 ppm. Samples of false killer whale had an average total mercury level of 46.9 ppm, with a high of 81.0 ppm. Even the levels in baleen whales were high. North Pacific minke whale samples had a total average mercury level of 0.10 ppm. "This shows that pollution levels in the ocean are at such a bad level that even filter feeders are bioaccumulating some kinds of contaminants," says Frank Cipriano, director of the Conservation Genetics Laboratory at San Francisco State University.

Perhaps even more alarming are the results of a separate study in which the team sampled mixtures of boiled internal organs—sold in packages in retail outlets—for total mercury and essential heavy metals. In samples of boiled small cetacean livers purchased between 1999 and 2001, the researchers found an average total mercury level of 370.0 ppm. Two samples had total mercury levels that topped 1,970.0 ppm.

"These levels are a thousand times greater than the worst samples that we get in predatory fish in the United States," says Charles Santerre, an environmental toxicologist at Purdue University. "With a tuna steak, you might get one part per million of mercury. This problem in Japan is in a different league altogether."

In their report, published in the December 2002 issue of *The Science of the Total Environment*, Endo and colleagues noted that acute mercury intoxication could result from a single meal of whale internal organs, with effects that can include serious nervous system symptoms, staggering, coma, and death. They called on the Japanese government to regulate human consumption of whale and dolphin internal organs.

In 2002, a revised Japanese national law required that all fresh seafood products be labeled with the species name. And on 3 June 2003, based on studies suggesting that fetal exposure to methylmercury could harm the developing nervous system, the Japanese health ministry issued a warning to pregnant women to limit consumption of certain whale products to no more than one 60- to 80-gram serving a week and bottlenose dolphin to no more than once every two months.

But, says Funahashi, "many products still lack a species name, and many have the wrong or false name" (there is no penalty for mislabeling). Furthermore, the Japanese word for whale, *kujira*, can also mean dolphin or porpoise. Some Japanese media have highlighted the mislabeling problem, so more consumers are aware of it, she says. "But cetacean meat is [no longer] a common food, so it is not a huge concern among the public—yet." **–John Tibbetts**

Ezra Clarke/EIA

Food Safety

New Data on Methylmercury and Fetuses

Eating fish is the main way most people are exposed to methylmercury, a neurotoxicant that in large doses causes mental retardation, seizures, cerebral palsy, and death. Because the fetal brain is particularly sensitive to methylmercury, the Seychelles Child Development Study was started in 1986 to ascertain the effects of low doses of methylmercury among 779 children living in these islands, whose mothers ate an average of 12 fish meals a week while pregnant. The latest report on the children at age 9 finds no detectable risk to the children.

Safer than expected? New findings show no detectable risk from methylmercury to children of moms who ate large quantities of fish while pregnant.

The Seychelles "is a perfect environment for a longitudinal cohort study of child development," says Philip Davidson, a professor of pediatrics at New York's University of Rochester Medical Center. "The population is a sentinel for the United States because they eat more fish." A former British colony, the island Republic of Seychelles, located in the Indian Ocean northeast of Madagascar, boasts free prenatal care, a low infant mortality rate, little pollution, and high socioeconomic status. This isn't a society where many children suffer from childhood diseases due to lack of medical care. So the children are basically healthy overall.

Davidson and colleagues had tested the Seychelles children previously at 6, 19, 29, and 66 months of age. In the latest study, described in the 17 May 2003 issue of *The Lancet*, a battery of 21 tests that measure cognitive ability, neurological function, and social behavior detected no major abnormalities. "We have been unable to confirm any adverse effects of prenatal exposure to mercury from eating fish in the Seychelles," says Davidson.

In fact, the study found that increased maternal hair mercury was associated with better scores on a scale of hyperactivity. The researchers speculate that some nutritional components in fish, and not a beneficial effect of mercury, may account for this finding. (Similarly, at 66 months, children with higher mercury had better language skills, which Davidson also thinks is likely due to nutrients in the fish.) The team has launched a new study to explore whether omega-3 fatty acids or other nutrients in fish impact hyperactivity and other developmental parameters.

The Seychelles mothers ate a variety of fish that contain similar concentrations of methylmercury as fish eaten in the United States. Their weekly fish intake was about 10 times greater than that of U.S. women, and the most commonly consumed fish was karang, a species of jack fish. The mothers' hair mercury levels averaged 6.9 parts per million (ppm), compared to 0.5 ppm in U.S. women.

Other groups' findings have not been so sanguine, and, while experts agree that methylmercury can harm the developing fetus, there is controversy regarding what constitutes a safe level of exposure. In studies of Faroe Islands women who ate diets high in whale blubber while pregnant, impairments in language, attention, and memory were found in their children at age 7. In New Zealand, a similar situation occurred with pregnant women eating shark muscle, popular in fish and chips. However, whale blubber and shark muscle contain 5–7 times as much methylmercury as the fish eaten in the Seychelles. Whale blubber is also high in polychlorinated biphenyls and other persistent pollutants.

"The Seychelles study addresses a very specific issue—the risks to the developing child of a pregnant woman eating mercury in fish," says neuropsychiatrist and epidemiologist Constantine Lyketsos of The Johns Hopkins Hospital in Baltimore, Maryland. So far, the levels of mercury consumed there have proven harmless. However, "higher levels of exposure may be harmful during pregnancy," cautions Lyketsos. **–Carol Potera**

EC Environment Strategy

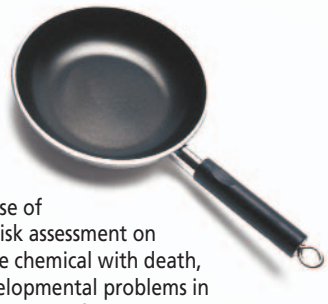
Research suggests that some 30% of disease in the European Union may be triggered by environmental agents. So on 11 June 2003, the European Commission adopted a strategy for environment and health aimed at filling in knowledge gaps about environmental health risks and strengthening capacity for policy making in this sphere. The strategy—which will first address children's health hazards including asthma, endocrine disruptors, and dioxins—calls for greater investment in research and integrated environment/health monitoring. The strategy's crafters also hope to increase awareness of environmental health among the public by bringing advocacy groups and other stakeholders into the drafting process of the next phase of the action plan, which should be finalized by mid-2004.

Hydrogen Booster

A new nickel/tin/aluminum catalyst developed at the University of Wisconsin–Madison provides a renewable, cheap, less energy-intensive way to turn biomass products such as the natural sweetener sorbitol into hydrogen fuel. Other methods to convert plant matter to hydrogen fuel use a costly platinum catalyst or require higher energy inputs than the resulting fuel yields. The new catalyst, however, costs one-thousandth as much as platinum, can be used at low reaction temperatures, and does not produce the potent greenhouse gas methane.

The Risks of Nonstick

This summer saw the launch of an intensified U.S. EPA investigation of perfluorooctanoic acid (PFOA), a component in the production of Teflon, Gore-Tex, and hundreds of other consumer goods. On 6 June 2003, the EPA held the first public meeting to begin negotiating an enforceable consent agreement for the chemical and for fluorotelomers, compounds that may degrade or metabolize into PFOA. Such agreements require manufacturers to generate and submit chemical data to the EPA on a specified schedule.



The meeting follows the April release of the EPA's preliminary risk assessment on PFOA, which linked the chemical with death, birth defects, and developmental problems in rats. Other recent studies have found low concentrations of PFOA in human blood, where it can persist for more than four years with unknown effects. One of the main puzzles regarding PFOA—and a primary target of future studies—is how it enters the bloodstream.

Top to bottom: Photodisc; Brand X; Corel

INNOVATIVE TECHNOLOGIES

Chilling Out with Sound

Keeping food cold but easily accessible is a resource-intensive undertaking, involving electricity, compressor motors, and insulation, as well as gases such as hydrochlorofluorocarbons and hydrofluorocarbons, which contribute to ozone depletion and the greenhouse effect. Now researchers are developing alternative equipment that uses the environmentally benign gas helium and thermoacoustic engine technology. The research could provide a new freezer that is efficient, environmentally sustainable, and cost-competitive.

The past 20 years have seen considerable progress in making efficient thermoacoustic engines, which convert heat energy into acoustic energy or utilize acoustic energy to pump heat from cold to hot regions. Researchers at the Applied Research Laboratory at The Pennsylvania State University developed thermoacoustic chillers for the U.S. Navy, and they are using that experience to develop a much smaller version for ice cream maker Ben & Jerry's. Ben & Jerry's was acquired in 2000 by Unilever, which owns a staggering 1.2 million freezer cabinets worldwide and thus has considerable stake and a corporate mandate to pursue environmentally friendly technologies.

Healthier ice cream? A new acoustic freezer being developed for Ben & Jerry's may be a more environmentally friendly way to store frozen treats.

Essentially, the chiller is a closed pressure vessel that contains a motor producing the acoustic energy, heat exchangers, and a regenerator, or "stack." Inside the stack, the oscillating sound from the motor compresses and expands groups of gas molecules. As they compress and expand, the groups transfer heat from the cooler to the warmer side of the stack, effectively pulling heat away from the interior of the refrigerator. Matt Poese, a Penn State research associate, calls the device "Bellows Bounce" after the metal bellows that, in conjunction with the motor, seals the vessel and generates the acoustic pressure.

The research group completed phase I trials in September 2003 and is in the process of demonstrating they can meet company targets for cooling power, size, and performance, according to Pete Gosselin, director of engineering at Ben & Jerry's. "They've shown that a strong potential exists to take an inert gas and operate it with no performance tradeoff against standard vapor-compression technology," says Gosselin. "The next phase will be taking this engine and integrating it into a cabinet." The goal for this is April 2004.

John Corey, a senior fellow at CFIC-Qdrive, another group developing thermoacoustic chillers, points out that today's home refrigerators are basically commodities driven by very low cost for components, automated production, and well-entrenched manufacturers. Conversely, the market for display coolers and large commercial units is more complex in the sense that a few large companies integrate subsystems such as compressors and heat exchangers from a variety of vendors. Given the more labor-intensive aspect of these largely custom-tailored units, a thermoacoustic unit that is simple and easy to integrate may well succeed. **–W. Conard Holton**

CANCER

Methyl Bromide Ups Prostate Risk

While many men know more about prostate cancer from firsthand experience than they want to, scientists know less than they would like. They do know, however, that African Americans and men with a family history of the disease are much more likely to develop this second-leading cause of cancer death in the United States. Smoking and eating a high-fat diet also appear to confer greater risk, and studies have linked the disease to exposure to pesticides and other farm chemicals. Now, for the first time, research has linked one particular pesticide—methyl bromide—with prostate cancer.

The study was part of the Agricultural Health Study, which the National Cancer Institute, the NIEHS, and the Environmental Protection Agency began in 1994. The participants filled out questionnaires about their use of pesticides and protective equipment, pesticide application methods, crops grown, livestock raised, smoking, alcohol use, diet, medical history, and more. The researchers determined the incidence of cancer through state cancer registries.

Scientists led by Michael C.R. Alavanja, a senior investigator with the National Cancer Institute, analyzed the relationship between exposure to common agricultural pesticides and eventual development of prostate cancer in 55,332 initially healthy men who applied pesticides in Iowa and North Carolina. Over a period of 4 years, 566 of the men developed prostate cancer. Among the 45 pesticides evaluated, the only statistically significant exposure–response trend observed occurred with methyl bromide, the team reports in the 1 May 2003 *American Journal of Epidemiology*.

Methyl bromide is a broad-spectrum pesticide that the National Institute for Occupational Safety and Health lists as a potential occupational carcinogen, based on animal studies. It is currently being phased out in the United States and elsewhere because of its damaging effect on the Earth's ozone layer.

Men exposed to the pesticide had a 2–4 times greater risk of developing prostate cancer than men not exposed, and the greater their exposure levels, the greater their risk. Study participants had a 14% higher risk of developing prostate cancer than the general population. Nineteen percent of the study's prostate cancer patients had a family history of the disease, compared with almost 9% of men who didn't get sick. Six insecticides were linked to prostate cancer only in men with a family history, conferring a two-fold excess risk of prostate cancer.

According to David Savitz, chair of the department of epidemiology at the University of North Carolina School of Public Health in Chapel Hill, the study is a unique resource, because it ascertains exposure levels in great detail, has a large study population, and is prospective. The study is so unique, in fact, that it would be difficult to replicate its findings or to support them with historical data, he notes.

Alavanja and his colleagues are currently assessing the link between lung cancer and pesticide use, with plans to assess the neurotoxicity of the studied pesticides. **–Tina Adler**

Arnold Greenwell/EHP

ehpnet

American Society on Aging

The American Society on Aging (ASA) is a nonprofit organization working to strengthen the skills and knowledge of professionals who work with older adults. Since its founding in 1954, its membership has grown to 6,000, with scientists, health care practitioners, policy makers, and businesspeople among the professionals in its ranks. On its website, located at http://www.asaging.org/, the ASA provides access to its program information and educational materials, many of which are available for free to nonmembers.

The ASA sponsors a number of meetings and educational conferences for both elders and those who work with them. The annual ASA–National Council on the Aging joint meeting brings together thousands of professionals to share information on new research findings. Also conducted annually is the Summer Series on Aging, a series of intensive multidisciplinary training sessions held around the United States that address issues including psychopharmacology and aging, and diversity in the aging population. Throughout the year, the ASA conducts web-based multimedia seminars, some of which are recorded and can be accessed on the website at any time.

One of ASA's special projects, funded by the Centers for Disease Control and Prevention, is titled Live Well, Live Long: Health Promotion and Disease Prevention for Older Adults. From the main project page, accessible by opening the Resources pulldown menu and choosing Health Promotion, visitors can access three stand-alone modules: Blueprint for Health Promotion, Strategies for Cognitive Vitality, and Optimal Medication Use. This project has been developed to help professionals build knowledge of the specific health and social service needs of our diverse aging population, and each module offers strategies for health promotion that are relatively inexpensive to implement. For example, the modules present step-by-step lists for activities such as organizing a community consortium and planning presentations on health topics of interest to elders.

Recently added to the site is a report, cosponsored by the EPA, that summarizes input gathered at listening sessions conducted in California with blacks, Laotians, and Latinos on environmental issues the participants encounter in their neighborhoods. The report is available in the Resources portion of the ASA site, within both the Cultural and Ethnic Diversity and the Healthcare sections. The EPA will be using this information to help formulate its National Agenda on the Environment and Aging. A draft agenda should be available for public comment in January 2004, and the final document should be complete by fall 2004.

The Publications page provides access to ASA periodicals and other published materials. The quarterly journal *Generations*, the bimonthly newspaper *Aging Today*, and the e-newsletter *ASA Connection* feature news on research and clinical practice, information on educational events, new programs, and other resources, and updates on federal legislation affecting aging adults and those caring for them. Select articles from each publication are available online for free. Quarterly newsletters designed for each of eight "constituent groups" within the ASA (such as the mental health community and professionals concerned with diversity and delivering services effectively across many cultures) are also accessible through this page.

ASA books and other materials in 21 subject areas, which include cognitive functioning, diversity, genetics, public policy, and technology, can be purchased online at the ASA Store. A media center is also available that provides links to ASA press releases and to Centers for Disease Control and Prevention background documents on issues ranging from how West Nile virus affects older adults to initiatives to increase physical activity in elders. The center also offers *Age Beat*, a bimonthly newsletter for journalists who write about aging. **–Erin E. Dooley**

Global GM Food Standards

Landmark guidelines for determining and managing the safety risks from genetically modified (GM) foods were recently approved by the Codex Alimentarius Commission, the highest international body on food standards. The new regulations are an attempt to help standardize and promote risk management and awareness of GM foods across the 169 Codex-member countries. By 2004, 35 countries will require government safety assessments of foods containing GM components before they can be marketed.

The guidelines cover GM food crops and microorganisms (used to produce foods and beverages such as cheese, yogurt, and beer). They include detailed provisions for premarket safety evaluations—including assessing the allergenic potential of GM foods—and for product tracing to aid in product recalls and postmarket monitoring.

Future Uncertain for Stockpiled Mercury

Mercury is a potent human neurotoxicant and, in some forms, may cause cancer in humans. Until sales were stopped in 1994, mercury stockpiled by the U.S. Department of Defense almost dominated the world mercury market, keeping prices low and supporting the continued widespread use of mercury. Nearly 10 years after the Department of Defense ended the sale of 10 million pounds of surplus elemental mercury owned by the federal government, the department issued a draft environmental impact statement in April 2003 that recommends consolidating the mercury into one long-term storage facility.

Public hearings on the draft document have been held to help determine whether this recommendation or some other action will be taken. The 500-plus comments received will be compiled into a record of decision to be released in early 2004.

Starstruck Smokers

A number of studies have shown that tobacco marketing influences the initiation of smoking in adolescents. Now a study led by Dartmouth pediatrics professor Madeline A. Dalton published in *The Lancet* explores whether smoking in movies triggers adolescent smoking. Dalton's team looked at 3,547 children aged 10–14 who reported never having tried smoking. The researchers concluded that over 50% of smoking initiation among these children could be attributed to watching movies depicting smoking, with those who watched the most movies with smoking almost three times as likely to light up as those with less exposure. Movie smoking also appeared to affect teens with nonsmoking parents more than those with parents who are smokers.

Top to bottom: Photodisc; ASA; Photodisc