

## The good, the bad, the mad cow

Stacie Bloom

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### News

Canadian officials in mid-January publicized another case of mad cow disease, formally known as bovine spongiform encephalopathy (BSE). This report came on the heels of an announcement by the Bush administration that importing Canadian beef would soon be allowed, reversing an earlier ban put in place when the first case of mad cow disease in Canada was announced in May 2003. The news is frightening to many, since eating the contaminated meat can cause variant Creutzfeldt-Jakob disease, a human form of the brain wasting sickness. Fueling this fear is a report that under certain conditions, prions – which are rogue molecules responsible for causing these diseases – can replicate in organs thought to be prion-free and safe to eat. In the report, published in the January 20 online issue of *Science* (1), Adriano Aguzzi and colleagues found prions in the liver, kidney, and pancreas of mice infected with a form of prion disease. It was thought that prions only inhabited an animal's brain, spinal cord, and immune system, organs that are removed from the animals before the meat is imported. The new study blurs the line between risky and safe organs and reinforces the need for beefing up inspection of animals in the food chain. Speaking to the JCI, Aguzzi warned that “BSE surveillance in the US is rudimentary.” Fortunately, [...]

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## NIH consulting ban a matter of ethics

After months of deliberation, NIH director Elias A. Zerhouni formally announced on February 1, 2005, that federal scientists would be prohibited from consulting for pharmaceutical, biotechnology, and medical device companies, as well as for any research institute that receives funding from the NIH. The new rules, which are expected to be put into effect quickly, also limit NIH researchers' stock investments in drug and biotech companies to \$15,000 and earnings from prizes and honorariums to only \$200.

The guidelines on consulting and accepting speaking fees were made liberal in the 1990s when former NIH director Harold Varmus was at the helm. Varmus encouraged outside consulting with the goal of recruiting better scientists to the NIH. But this policy drew widespread criticism for presenting researchers with potential conflicts of interest. In some cases, NIH employees accepted exorbitant, and perhaps unethical, consulting fees.

The new guidelines have brought about mixed reactions from the research community. Some argue that the rules put federal scientists at a disadvantage compared with their academic colleagues, many of whom engage in outside pursuits to boost their salaries and promote scientific discovery. They also fear this will discourage good scientists from working for the NIH. Supporters of the plan feel that these rules are needed to ensure the public's trust in the NIH and that they will not negatively affect scientific exchange. Of course, NIH collaboration with academia and industry is critical to the advancement of science and for bench-to-bedside translation of research. The impact of the new regulations on NIH recruitment and interaction with external colleagues will be monitored as these guidelines are implemented.

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## Tsunami threats: the long and short of it

We now know that the catastrophe of December 26, 2004, was one of the greatest natural disasters in history. The tsunami that ripped through the Indian Ocean stole more than 150,000 lives and left thousands more injured, homeless, orphaned, and desperate. What we don't yet know are the long-term threats to public health that the tsunami will leave in its wake.

The primary effects of the sea surge have been made clear in the weeks that have passed. The majority of deaths were a direct result of drowning and traumatic injuries. The force of the waves washed away houses, medical facilities, fisheries, and food supplies. The impact of this devastation is tangible and evident, but the long-term threats to public health are more uncertain, and the threat of an epidemic looms. Damage to sewer systems and contamination of drinking water supplies poses the gravest threat and can lead to a multitude of water- and food-borne diseases such as cholera, hepatitis A and E, diarrhea, typhoid fever, shigellosis, rotavirus, and leptospirosis. Pools of standing water pose the threat of mosquito-borne diseases such as malaria and dengue fever. Overcrowding in refugee camps raise the risk of pneumonia and other respiratory ailments.

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Preventive measures are in place to ensure the safety of area inhabitants — careful surveillance, distribution of health kits and chlorine tablets, vaccinations, education, organization of resources, and relief efforts will all



Assuring access to safe drinking water is key for reducing the risk of disease. Getty images.

help to keep epidemics at bay and preserve the health of survivors. "Now that the crisis is weeks old, the risk of major outbreaks directly resulting from the tsunami . . . may already be behind us, and will probably be almost gone by the end of three months," says Les Roberts, a water engineer and disaster expert at the Johns Hopkins Bloomberg School of Public Health. But, he adds, "Disasters which ravage economies can elevate infant mortality and disease transmission patterns for years."

The mental consequences of this catastrophe also pose an insidious threat. Although psychosocial services are being provided in some areas by international organizations, the long-term effects can only be speculated. The incidence of posttraumatic stress disorder and depression is expected to be very high. Survivors also face a lasting sense of loss, fear, helplessness, and shell shock, says Carol Etherington, former president of the US board of Doctors Without Borders and an expert on international volunteer efforts who has worked with the International Medical Corps and the Red Cross. Adults can cope with and make sense of a natural disaster, she explains, but children will have a harder time putting the horror into context. But, she adds hopefully, "people are resilient."

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Fueling this fear is a report that under certain conditions, prions — which are rogue molecules responsible for causing these diseases — can replicate in organs



Beefing up inspection of cattle is necessary to prevent the spread of BSE.

thought to be prion-free and safe to eat. In the report, published in the January 20 online issue of *Science* (1), Adriano Aguzzi and colleagues found prions in the liver, kidney, and pancreas of mice infected with a form of prion disease. It was thought that prions only inhabited an animal's brain, spinal cord, and immune system, organs that are removed from the animals before the meat is imported. The new study blurs the line between risky and safe organs and reinforces the need for beefing up inspection of animals in the food chain. Speaking to the *JCI*, Aguzzi warned that "BSE surveillance in the US is rudimentary." Fortunately, the results are no cause for alarm, since the chances of contracting prion disease, only seen once in the US, are so low that a major epidemic of the human form of mad cow is very unlikely.

1. Heikenwalder, M., et al. 2005. Chronic lymphocytic inflammation specifies the organ tropism of prions. *Science*. doi:10.1126/science.1106460.

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## Weighing in on obesity's nature-versus- nurture debate

Nearly two-thirds of Americans are overweight or obese, and the diagnosis of type 2 diabetes in children has doubled in the past 25 years. Better knowledge of the genetics of obesity combined with adherence to healthier dietary rules can equip Americans with what is needed to fight this trend. J. Phan and K. Reue now report that lipin is another gene involved in determining a person's susceptibility to weight gain (1). Mice with higher levels of lipin gain twice as much weight as do normal mice when both are fed a diet high in fat. But people cannot put all the blame on their genes alone. Accordingly, former Health and Human Services Secretary Tommy Thompson announced on January 12, 2005, that the US Department of Agriculture's food pyramid has been redesigned. Americans are now encouraged to consume more fruits, vegetables, and whole grains and less fat, calories, and sodium. The new guidelines also call for exercise and emphasize weight management. Research examining eating behaviors and fat storage are still in their infancy but are already proving to be extraordinarily complex processes. Getting people to stick to the new food guidelines may turn out to be less successful.

1. Phan, J., and Reue, K. 2005. Lipin, a lipodystrophy and obesity gene. *Cell Metabolism*. 1:73-83.

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