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MAD COW HITS THE U.S.

# Mad-Cow Testing on Trial

## Should U.S. Start to Screen Every Last Cow, as in Japan? 'A Negligible Cost Increase'

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**Staff Reporters of THE WALL STREET JOURNAL**

When mad-cow disease struck, nations across Europe struck back with comprehensive cattle-testing. So did Japan.

Is the U.S. next?

It wouldn't be hard: Four companies already offer test kits that can, within four hours, tell if a slaughtered cow carries bovine spongiform encephalopathy, otherwise known as BSE or mad-cow disease. It wouldn't cost much: Test kits cost about $10 a pop.

Add in salaries of lab technicians, the cost of grinding up and delivering cattle brain samples for testing, and the tab would be $30 to $50 per animal, industry experts say. The average U.S. cow slaughtered for food yields meat with a retail value of $1,636.



Each year in the U.S., about 35 million cattle are slaughtered. About 10 million of these animals -- those over 30 months of age -- would be tested for BSE if the U.S. were to adopt European standards, because age is associated with infection.

Varying Standards

Japan tests every cow slaughtered in that country while the U.S. currently tests just a fraction.

**U.S.**
Cattle slaughtered: 35 million in 2002
Cows tested for BSE: 20,000 in 2002

*Testing process:*
A sample of "downer" cattle -- cattle that can't walk into the slaughterhouse -- are tested for bovine spongiform encephalopathy (BSE)
Tissue samples from the cows' brains are extracted, then taken to a government laboratory.
Tissue is stained with a liquid containing antibodies to prions that cause mad-cow disease. Lab technicians inspect for tiny dots that represent antibodies reacting to prions.
Tests take four days. Until recently, beef from tested cows entered the food chain before results were back. USDA now won't allow downer cattle to be used as food.

**JAPAN**

Cattle slaughtered: 1.3 million in 2002
Cows tested for BSE: 1.3 million in 2002

*Testing process:*

The grand total to test about 10 million cows in the U.S. would be $300 to $500 million a year. Considering that Americans spend more than $50 billion on beef annually, that would add between six cents and 10 cents per pound.

"Cost should not be a prohibitive factor," says Scott McKinlay, president of InPro Biotechnology Inc., South San Francisco, Calif., a test-kit maker founded by Nobel Prize-winning researcher Stanley B. Prusiner.

"Look at Canada as an example," says Mr. McKinlay. "They have suffered about a $600 million loss already" in lost beef exports and consumption.

Japan has the most extensive testing system in the world. All slaughtered cattle there are tested, no matter the age. "Public opinion supports the policy of testing every cow," says Kazuki Ikeda, an official in the Agriculture Ministry's Department of Meat and Poultry. "For a relatively small cost, consumers feel their safety is guaranteed."

Still, even some testing-firm officials believe Japan's program is excessive, largely because the brains of younger cattle are extremely unlikely to contain infectious prions, the malformed proteins that carry the disease.

"I like to sell test kits, but [Japan's approach is] insane," says Markus Moser, co-chief executive of Zurich testing firm Prionics AG. Throughout the continental European Union, countries test all cattle over 30 months that are slaughtered; Germany includes all over 24 months.

The American approach has been to test only about 20,000 cattle annually, roughly one in every 1,700 slaughtered. The animals chosen for testing are "downer" cattle, those too ill or lame to walk into the slaughterhouse, and are subjected to an "immuno-histochemistry" test that takes at least five days for results.

The Washington State Holstein that was tested and found to harbor mad-cow disease was a downer, and its meat entered the food chain before the testing was complete -- an occurrence that might have happened any time under regulations then in effect. Tighter U.S. regulations announced this week prohibit the slaughter of downer cattle for food. But testing for BSE will continue to focus on downer cattle, presumably because they are likelier to carry the disease.

Brain particles are extracted from cows' skulls and put into test tubes. The samples are cleansed with chemicals and then heated before being scanned by a machine. Testing takes four to five hours. If positive for prions, the meat is held while other tests confirm presence of BSE.

**EUROPEAN UNION**

Cattle slaughtered: 10.4 million in 2002
Cows tested for BSE: 7.3 million from January to September 2003

*Testing process:*
Process is similar to that of Japan. All animals that show signs of disease are tested for BSE.
In most of the EU, all healthy-looking animals older than 30 months are tested for BSE.
In Germany, it's those over 24 months.
In Sweden, it's a random sample.
Britain doesn't allow any animal over 30 months to enter the food chain.

AP/Wide World Photo

Calf carcasses at a **Paris** meat market.

U.S. industry and government executives say they see no great need for wider testing. But others point out that symptomless cattle can carry the disease. Indeed, among 8.5 million older cattle tested in Europe in 2001, tests found 2,142 carried BSE.

In the European experience so far, testing all older cattle has cost roughly $30 to $50 per cow. In Japan, it is about $31 per cow. Japan uses test kits made by **Bio-Rad Laboratories** Inc. of Hercules, Calif., and Ireland's Enfer Scientific, which licenses its test to **Abbott Laboratories**, North Chicago, Ill.

"In Switzerland and the rest of Europe, it is a negligible cost increase, a few cents in the cost of beef," says Prionics's Dr. Moser.

After a single Alberta cow tested positive for BSE in May, Canadian officials tested the herds that had come in contact with the animal. The Canadian government has stopped short of instituting a European-style testing program, but Bruno Oesch, co-CEO of Prionics, says Canada now plans a more extensive surveillance system of approximately 50,000 tests annually. Canadian officials didn't respond to calls for comment.

Dr. Oesch predicts that the minimum probable U.S. program "is going to be a surveillance program of half a million animals." The U.S. Agriculture Department says it's too early to say.

Because of its slowness, the U.S.'s current immuno-histochemistry test wouldn't be practical for widespread use. Various firms have created faster tests. But before any could be used in the U.S., the tests must first be approved by the Agriculture Department. That hasn't happened yet. Following the Canadian outbreak, Abbott sent its test data to the department in October, says Jim Koziarz, Abbott's head of diagnostics research. "The Canadian experience provided an impetus," he says.

Any testing program would need government vigilance to ensure that labs employ trained personnel and that tests minimize the problem of false positives, a problem that initially plagued German cattle testers.

Three years ago, German lab technicians found 100 positives among 200 brain samples from cattle -- four times as many BSE cases as were then extant in Germany. The findings, from kits made by Bio-Rad, in some cases led to quarantining farms and slaughterhouses. But subsequent tests discovered it had been a false alarm. Bio-Rad says the problem was with the labs, and testing industry executives generally say the false-positive problem, while already small, is getting smaller.

"In Germany, anybody who had a lab could do testing," says Dr. Oesch. "In Italy, they took tight control and only allowed test reading in government labs. Now, BSE isn't a topic there anymore."

Industry and U.S. laboratory estimates suggest the false-positive rate is about 1 in 10,000 with some of the tests. This would mean 1,000 cattle out of 10 million tested could result in false positives. When that happens, the next step is to "test the test" with the slower test used by the Agriculture Department. Colorado State University's Veterinary Diagnostic Laboratory uses the same rapid test to check deer and

Kyodo News

Examining beef at a **Tokyo** inspection center.

elk for "chronic wasting disease," another prion disease like BSE.

Barbara Powers, director of the Colorado State lab, says the false-positive problem is "very, very rare" -- about 1 in 10,000 -- and the lab in those instances simply verifies the result using the current, slower test.

A potentially more serious problem: false negatives. Prions can be present elsewhere in younger animals before traveling to their brains. There is currently no practical way of rooting out all such cases, but these are believed to be extremely rare and far less likely to infect people who eat them.

There are "differences of 10 million-fold in infectivity" between such an early-stage animal and the far more infectious, older animals with prions in the brain, Dr. Moser says.

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