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## MAD COW HITS THE U.S.

# Prion Research in U.S. Is Limited

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When Paul Brown worked at the National Institutes of Health in the 1970s, it was a heyday of prion research when scientists explored the brains of chimpanzees and rode high on a series of seminal discoveries.

Today, Dr. Brown calls himself "the last living relic" of those good old days. He's got no laboratory and gets no research money from the institute. A key source of funding now: the beef industry.

With mad-cow disease in the U.S. raising a host of medical, regulatory and safety questions, the limited extent of American research on prion diseases is coming under a new spotlight.

In 2002, the National Institutes of Health spent \$27 million for research on prion diseases, including mad cow, scrapie in sheep, and human Creutzfeldt-Jakob disease. The U.S. Department of Agriculture spent another \$6.6 million. But those sums are dwarfed by the \$50 billion U.S. consumers spend on beef annually and even the \$50 million spent by the cattle industry on promotion and education.

### MAD COW HITS THE U.S.



1 See [full coverage](#)<sup>2</sup> of the first case of mad-cow disease in the U.S.

### DOW JONES REPRINTS



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Indeed, critics say the U.S. has never put its full scientific muscle into studying mad cow, falling prey to the idea that it could never happen in America. A panel convened in November by the Institute of Medicine in Washington, called the domestic infrastructure for prion research "small, aging," and said it suffered from a "paucity of funding."

Now that a sick cow in Washington State has been ground into hamburger and put on supermarket shelves, researchers are dusting off their grant proposals as companies hustle to capture what could be an immense market to test for prions in cattle.

On Dec. 24, the day after the positive test result was announced, the White House approved the transfer of an

additional \$5 million to the Agriculture Department so it can perform more tests. With about 35 million cattle slaughtered in the U.S. each year, some estimate the testing market to be valued at more than \$1 billion in products and services.

"I go to bed every night offering prayers of thanks to the great mad cow in the sky, because it's BSE [bovine spongiform encephalopathy] that has really put our field in the money," Dr. Brown says.

Mad-cow is a type of transmissible spongiform encephalopathy, a class of unusual brain-rotting diseases that also afflict sheep, deer and humans. For years, they were considered a bizarre curiosity -- an infectious dementia with few similarities to any known disease. Some of the best-known research on the disorders involved cannibals on the island of Papua New Guinea, who spread Creutzfeldt-Jakob by eating dead relatives.

The strange conditions intrigued researchers, and led to two Nobel prizes: for Carleton Gajdusek, in 1976, and Stanley Prusiner, in 1997.

But the tiny field also earned a reputation for big egos and long-running scientific feuds. "Prion research is a very contentious area. A lot of people don't get along with each other," says Richard T. Johnson, the Johns Hopkins University neurologist who chaired the Institute of Medicine panel and now is advising the NIH on improving research.

The big mystery at the center of the field is the prion (pronounced PREE-ohn) itself. It's still unclear exactly what the particles are, but research has identified misshapen proteins that seem to spread inside the nervous system, eventually ravaging the brain.

Part of the reason prion research hasn't sped ahead is that these unique diseases aren't easy to study. While scientists discovered the virus that causes SARS and decoded its genes in a matter of weeks last year, the tools available for studying prions are far more laborious and expensive.

At Britain's Veterinary Laboratory Agency, in Weybridge, England, workers maintain 350 live cattle that received doses of tissues from sick animals starting in 1996. Veterinarian Danny Matthews says it costs £1 million (\$1.7 million) a year to feed and keep the cattle, as researchers wait years to see which eventually fall ill. Such tests are the best way to find out if a certain type of tissue can cause infection, and whether it should be kept out of the human food chain.

Britain spent £40 million on prion research last year, more than any other country. In the U.S., research budgets began to grow starting in 2000, after BSE was found in cattle in continental Europe.

U.S. agencies also became alarmed over chronic-wasting disease, a mad-cow like disease in deer and elk, first discovered in Colorado in 1967 but now found in a number of Western states.

In 2002, Congress directed the U.S. Department of Defense to invest \$42.5 million, mostly in research aimed at developing a better diagnostic test that could pick up BSE in live animals. (Current tests are done on the brains of dead livestock.) Such a test could essentially eliminate the risk of the disease.

**MEDICAL MYSTERIES**

National Institutes of Health research funding for selected diseases and U.S. deaths from them

	<b>2001 U.S. DEATHS</b>	<b>2002 NIH FUNDING (millions)</b>
Spongiform encephalopathy	2501	\$27.32
HIV/AIDS	14,175	2,500.00
Diabetes mellitus	71,372	790.3
Breast cancer	41,809	640.4
Alzheimer's disease	53,852	594.7
Prostate cancer	30,719	345.3

1) Estimated deaths from Creutzfeldt-Jakob disease. No deaths were linked to BSE.

2) Includes funding for scrapie, chronic-wasting disease, BSE and Creutzfeldt-Jakob disease research.

Sources: *National Institutes of Health*

Industry groups also have begun investing in studying mad cow. James Reagan, vice president for research and knowledge management at the National Cattleman's Beef Association, says the trade group and fast-food chain **McDonald's** Corp. together gave \$1.3 million in grants in 2002, and followed up with about \$300,000 last year.

Most of the money went toward finding ways to inactivate prions in feed or beef. The NIH's Dr. Brown says he got \$100,000 to see whether prions, which can't be cooked away or killed the way bacteria are, can be destroyed under high-pressure, a technique he says is showing promise.

The cattlemen also fund an Agriculture Department research outpost in Pullman, Wash., that is trying to learn whether some cattle have genetic resistance to BSE. Mr. Reagan says if they find DNA differences, breeders quickly could begin raising herds less likely to come down with mad cow.

But numerous gaps in research remain, including a paucity of government facilities that can conduct costly animal tests. The Institute of Medicine's panel,

for instance, said the NIH should re-establish a top laboratory at its big research campus outside of Washington. Dr. Brown, the lone prion researcher left there, says that hasn't happened yet.

The panel also found that money wasn't spread widely enough. According to the report, the NIH funded only 20 different groups, and that half the money went to just two labs -- one of them run by Nobel Prize winner Dr. Prusiner at the University of California, San Francisco.

Other scientists have complained the California lab wields too much influence. And they note that Dr. Prusiner's private testing company, InPro Biotechnology of South San Francisco, now is trying to win government cattle-testing contracts. InPro president Scott McKinlay says he thinks Dr. Prusiner's record in battling prion diseases speaks for itself.

Funding isn't the only obstacle to more mad-cow research. The government has classified the BSE prion as a "select-agent," along with anthrax and other biohazards that could be used as terror weapons. That requires strict accounting and extra laboratory safety. So while most prion labs work with sheep or human tissues, in the U.S. only a handful work directly with BSE.

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