

breast cancer in women. He wants the FDA to require studies of the toxicological effects of milk hormones in large-scale tests on cows for several years to make sure there are no adverse effects on them or their offspring.

Another Epstein charge is that the rbGH manufacturers have manipulated published data on human health effects and failed to disclose data showing the drug causes ill effects in cows—including lesions and a higher incidence of infectious disease. Epstein is calling for a full-scale investigation of the FDA and the hormone's makers.

Both the FDA and the companies think they have good answers for all of Epstein's points. More than 130 studies have been done on rbGH by industry and independent scientists, and no definitive health effects have been found, industry and FDA spokesmen say. "Everyone in the whole science world except for Dr. Epstein would not think [rbGH] ever would be active in humans," says C. Greg Guyer, an FDA pharmacologist and one of the authors of the current review.

That review concludes that rbGH is very unlikely to be biologically active in human beings. For one thing, the hormone is known not to be active when injected intravenously into children suffering from dwarfism due to a lack of growth hormone. And in the review, Guyer and his colleague cite findings that even in rats—which are known to respond to intravenous doses—oral dosages don't produce biological effects.

As for safety effects on animals, Monsanto spokesman Larry O'Neill concedes that some cows given the hormone did develop mastitis, an inflammation of the udder, and other symptoms. But, O'Neill adds, those cows were given five times the normal dose of rbGH in toxicology studies that are now being reviewed by the FDA—not covered up, as Epstein has suggested.

Yet Epstein's report has had consequences. It caused four grocery chains and several food-processing companies to refuse milk from treated herds while the hormone remains under FDA review. And although the all-out blitz on the FDA he asked for hasn't happened, his criticisms did prompt the General Accounting Office and the Inspector General of the Department of Health and Human Services to begin audits of the agency's regulatory process for rbGH.

But those audits have begun to take on a routine character to the FDA, which has been looking into the health effects of rbGH since 1982. "You almost have to take a number to decide who's going to review our process next, but we feel comfortable about it," says Guest. "I suspect this will be the most extensively studied product we've ever handled."

■ ANN GIBBONS

Greens Make Physicists See Red

West Berlin

Last week, West Germany's Green Party notched up a victory over a nuclear reactor—and left many German researchers hopping mad. Michael Schreyer, a Green member of West Berlin's elected council who has responsibility for the environment, refused to grant an operating license for a newly refurbished nuclear reactor at the Hahn-Meitner Institute (HMI). The decision, which will be difficult to reverse, could be the death warrant for the institute, the only West German national laboratory in West Berlin. And if HMI dies, it will be partly due to an action taken 5000 miles away in Washington, D.C., by the Sierra Club.

The Hahn-Meitner Institute is named after Otto Hahn and Lise Meitner, who (with Fritz Strassmann) discovered nuclear fission in Berlin in 1938. The small reactor, which cost \$110 million to refurbish, was to have been the centerpiece of the institute's research. Scientists there planned to use it as a source of neutrons for biology, chemistry, medicine, and physics. If the reactor never starts up, fears HMI director Hans Stiller, the researchers will drift away.

Though the reactor would be operating in an urban area, Schreyer did not block it on safety grounds, but, instead, objected to HMI's plans to deal with the reactor's spent fuel. And that's where the Sierra Club comes in. Until 1988, operators of five existing German research reactors simply returned their fuel elements to their supplier—the United States—and HMI planned to do the same with the new Berlin II reactor. But a lawsuit filed by the Sierra Club in Washington, D.C., has forced the U.S. Department of Energy to suspend return of spent fuel rods while it prepares an environmental impact statement on the shipments. The other research reactors are storing spent fuel rods onsite until the issue is resolved, but HMI didn't have that option: The operators of new reactors must show they can dispose of spent fuel before they can get an operating license.

The institute did come up with an alternative. It proposed shipping the fuel rods to the United Kingdom Atomic Energy Authority's reprocessing plant at Dounreay in Scotland. Under an agreement already signed between Nukem, a subsidiary of Siemens that operates the reactor, and the UKAEA, the rods would be stored at Dounreay for 6 years and, if the U.S. route remained blocked, they would then be reprocessed there. The processed fuel rods would be returned to Berlin and Dounreay would hold the waste for a further 29 years. By then, Germany should have its own long-term waste repository.

Schreyer didn't buy it, pointing out that Germany's plans for waste storage are still uncertain. HMI director Stiller counters that Schreyer's demands for a final repository for the waste are "unrealizable and illegal," and says "we will challenge this decision in court." But Stiller estimates it could take several years for a legal appeal to run its course. Moreover, the courts can decide only whether Schreyer's ruling complies with the law; they cannot reverse it. If there is a legal flaw, the whole licensing procedure would have to start over.

Meanwhile, it is costing HMI \$1.16 million a month to mothball the reactor. And, to make matters worse, the federal research minister, Christian Democrat Heinz Riesenhuber, has threatened to cut off Bonn's contribution to HMI's budget unless the license is granted; federal funds make up 90% of the \$65 million total.

Berlin's senator for science and technology, Barbara Riedmüller, is angry about the delay and the final decision. The HMI is "like a steel mill without a blast furnace," she says. But at this point, there's little that the reactor's supporters can do. Schreyer's decision cannot be overturned by majority vote, since the nuclear licensing procedure, like all planning procedures, is specifically independent of political intervention.

A new government for a unified Berlin, to be elected on 2 December, could find ways to reverse Schreyer's decision, perhaps by rewriting the law. But that would take time, and the uncertainty is already clouding the HMI's future. Researchers have been leaving, and Stiller says the trickle will swell in the wake of last week's decision. Stiller himself had to be lured out of retirement 2 years ago to direct the HMI through these troubled waters. His term ends in December, and although the HMI has been searching for the past 4 years, no successor has been found. ■ RICHARD SIETMANN

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