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COMMENTARY

Mad Cows and Other Animals

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When just before Christmas, a single dairy cow in Washington state was found to have bovine spongiform encephalopathy (BSE) or "mad cow disease" many of us meat eaters were faced with a choice more complex than whether we wanted our steak well done or rare. I heard the words "mad cow" as many times as I heard "Santa" this holiday season, and I saw more than one patron hesitate while perusing a restaurant menu. America's trading partners all over the globe hesitated not at all: they slammed their doors on American beef. As the industry and government scrambled to respond, the Chick-fil-A billboard that features a cow trying to save its brethren by saying "Eat More Chicken" began to look not just cute but prescient.

Eating beef from cows with BSE is linked to a rare, progressive and fatal degenerative brain disease called new-variant Creutzfeldt-Jacob disease (or vCJD), to distinguish it from CJD which, though rare, occurs sporadically in older persons. What exactly is the risk for vCJD from beef? Britain's experience in the last decade is instructive. A massive outbreak of BSE there affected some 200,000 cows, and resulted in the slaughter of many herds and great economic loss. (The practice of grinding up dead sheep and cows and feeding them to other cows was thought perhaps to have caused a disease of sheep called Scrapie to make its way to cows. Incidentally, the use of animal feed containing brain and spinal cord to feed cows was banned in the U.S. in 1997, though such feed is still given to poultry and household pets, and therefore it is not a ban that is easily enforced.)

In the ensuing years after BSE was recognized, the cumulative number of patients with vCJD in Britain reached about 150. Such numbers, though tragic for the individual and their families, suggest a very small risk given that 60 million people in Britain might have consumed beef. And vCJD seems to be associated with eating brain (or other nerve tissue), a dish not as popular in America as it is in Europe. If it turns out that the Holstein in Washington state is the sole cow with the disease in America, and if, as the government hopes, it can prove that the cow came from Canada, the risk of vCJD in our population might turn out to be minuscule.

But even if we assume a best case scenario, restoring consumer confidence will require more than statistics and clever billboards. In the last few days we have all learned more about the beef-processing industry than is good for the non-vegetarian appetite, and in case we missed the gory details, our vegan friends and family members have been quick to point them out. The beef industry finds itself on the defensive for effectively lobbying against legislation that would have prevented "downer" cows -- those

that are sick and cannot stand -- from being slaughtered and the meat entering the system. The sick Holstein in Washington was just such a downer, which was why its tissues were sent for testing; it was nevertheless slaughtered and its meat shipped out to several states.

The meat industry has argued that legislation against the slaughter of downers would only encourage farmers to keep such cows on the farm, prevent them from ever being tested, and perhaps even allow the meat to be sold surreptitiously. Such an argument seems particularly weak in present circumstances. Surely it would be prudent to keep the estimated 200,000 downer cows out of the food system altogether, particularly when they are such a small fraction of the 30 million cows slaughtered each year. And, given the size of the meat industry and the crippling economic effects of a BSE outbreak, expanded testing and tracking of herds would be in order.

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The critter at the heart of this story is, however, not the cow but the mysterious prion, and yet to call a prion a critter is to be generous. Prions are proteins with a predilection for turning the brain into a spongy mess, and yet they lack the nucleic acids we usually associate with proteins that can replicate. How then does a protein produce disease? Is such a protein even alive in the conventional sense? How, in the absence of nucleic acids, does it transmit itself from one animal to another, or, as in the case of Kuru, a disease associated with cannibalism, from one human to another? Prions assume a certain configuration, a peculiar way of folding when in the disease state, which triggers other prions to fold the same way in a kind of domino effect. Certain individuals and certain species because of their genetic makeup seem to be at risk. Prions are not destroyed by conventional methods, least of all by cooking. Given the vast uses we make of animal tissue -- in vaccines, supplements, foods, gelatin, surgical and prosthetic products -- the theoretical potential for prion-related disease is huge. Since prion disease has a latent period of many years, it is an epidemiologic challenge to link prion disease to a particular exposure. The public's awareness of prions will come with new demands on scientists to produce breakthroughs in this field.

Diseases like SARS (which was thought to have originated in the slaughterhouses of Guangdong in China), AIDS (which probably had a simian origin) and vCJD demonstrate how intricately our well-being is linked to other species. New and emerging infections have a way of illuminating our social practices -- dietary, sexual, recreational -- holding them up for us to see in a new light, even as they exploit them.

Should we be now asking hard questions about our diets, and our food choices? Upton Sinclair's 1906 novel, "The Jungle," was an exposé of some of the gruesome practices of the meatpacking industry of

his time. His purpose had been to highlight the exploitation of the working poor using an industrial backdrop, but as Sinclair himself said, "I aimed at the public's heart, but by accident I hit it in the stomach." The recent blow to the public's stomach will certainly generate a moral argument against beef couched in pseudo-scientific terms. But I think we must resist the temptation to moralize in a knee-jerk fashion, and instead focus on the science. The last year has shown us through the examples of SARS, and now BSE, that economies are hugely vulnerable to diseases and even more vulnerable to their metaphors. This is something we have always known but too easily forget. Surely, one of the best uses of our investment dollars to protect not just the multibillion dollar meat industry but all our industries and our very lives, is more public support, more government support and more industry support for basic research, and more concerted efforts to breed the next generation of scientists and promote the culture of science.

And when we next dine out, what are we to do? Recommendations and interdictions in light of the mad cow news are making the rounds. But the big picture, let us not forget, is the epidemic of obesity and diabetes in this country, and that should be the focus of dietary interventions. Common things, as we are fond of teaching our medical students, occur commonly.

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