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In defense of Alberta beef

by Milly Ryan Harshman

When an Alberta cow was found to have “mad cow disease”, known formally as bovine spongiform encephalopathy (BSE), many people were surprised that it could happen in Canada.

The infected animal had been condemned at slaughter for poor health, but had not yet showed signs of BSE. No meat from the cow entered the human food chain, and the brain was sent to a lab as part of the routine surveillance program for BSE. When the cow was identified as having BSE, the Canadian Food Inspection Agency took immediate action. All other cattle that could have been connected to the infected cow were quarantined. This included calves born to the infected cow, as well as cows that may have accidentally come into contact with poultry feed that contained rendered material from this cow.

Speculation about “mad cow disease” in Canada caused stock market values for restaurants that specialize in beef to drop. The U.S. banned Canadian beef imports, even though only the one cow was shown to have BSE and no person has eaten beef from that cow. By the end of May, nearly

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400 animals had tested negative for BSE, and testing was continuing on hundreds more, including those believed to be part of the cow's birth herd.

BSE vanishingly rare in Canada

BSE has been identified in only one other cow in Canada. That animal, diagnosed in 1993, was imported from Britain in 1987. Since that time, several measures, including the surveillance program, have been put into place to safeguard against diseases that pose a food safety risk. Since 1997, Canada has banned the feeding of rendered protein products from cattle, sheep, goats, bison elk or deer to other ruminants. Ruminant-derived meat and bone meal for livestock feed has not been imported from Europe, where BSE was in the news in 1996, for more than a decade.

Beef and dairy producers can help reduce the risks by ensuring that the proper feed is given to their animals, particularly if they also raise non-ruminants such as chickens or pigs or mix their own feeds. Keeping good records is essential to maintaining a high degree of food safety. The new Canadian Cattle Identification Program, introduced in 2001, will add to Canada's ability to reduce risks.

What's different about BSE?

What people worry about is that, unlike bacteria, the prion that causes BSE is not altered by cooking. This mis-folded protein can cause new variant Creutzfeldt-Jakob disease, a brain-wasting sickness in humans.

The diagnosis of BSE in a single cow that was never sent to beef markets poses very little risk. Nevertheless, CFIA and Health Canada work cooperatively to investigate the connections to the infected cow and assure the public that the safety of the food supply remains high.

The bottom line? Alberta still produces a great steak, and consumers can be assured that any food safety risks are kept as low as possible. Grocery store owners, who are often on the front lines for consumer questions about food safety, should remain confident and tell consumers that beef is safe to eat.

Milly Ryan-Harshman, Ph.D., R.D. is owner of FEAST Enterprises, based in Oshawa, Ontario. She is a writer, speaker and professional nutritionist whose work centres on biotechnology, antioxidant nutrition, and functional foods.

Bringing home the bacon

A new high-throughput DNA fingerprinting technology will soon make it possible to trace the bacon on your breakfast plate right back to the farm that produced it.

Pyxis Genomics promises to deliver this long sought after feature for meat processors: traceability from farm to fork. The company is developing a panel of genes for Canadian food processor Maple Leaf Foods that will form the basis for the system, the first phase of which should be implemented this fall. Growing interest by Canadian consumers, as well as coming legislation in Japan and Europe, are behind the push to allow foods to be traced back to their source.

According to Tyler Bradley, Business Development Associate with Pyxis, the Japanese market is of particular interest, as it is the largest pork importer in the world. Canada is a main supplier.

Bradley explains that the technologies are adaptable to other food animals such as beef and poultry. However, Pyxis, a developer of platform technologies, would more likely find commercial customers such as Maple Leaf Foods to take advantage of their services.

Pyxis, headquartered in Chicago, opened a research and development office in Saskatoon to, among other things, access the expertise available at the Vaccine and Infectious Disease Organization (VIDO). The company is currently

partnering with VIDO, Simon Fraser University and the University of British Columbia to study immunity in food animals. The three-year project, backed with \$27 million in Genome Canada funding, promises knowledge that will help keep food animals – and the food they produce – healthy and safe.

Source: Pyxis Genomics Canada at <http://www.pyxisgenomics.ca>

Errata:

Please note that in the printed version of the Spring 2003 issue of Newtrition, UK supermarket giant Tesco was incorrectly identified as being based in the U.S. Also in this issue, Enova Oil was incorrectly identified as "Enola", with an incorrect Web address. The correct address is [http://www.Enova Oil.com](http://www.EnovaOil.com). These errors do not appear in the online version of Newtrition, available at <http://www.agwest.sk.ca>.

Addressing food safety at the source

E. coli O157:H7 isn't just a food-borne illness; it can be picked up from contact with cattle or from water contaminated with runoff from livestock operations. It can even show up in fruits and vegetables irrigated with contaminated water. Here, the bacteria can be actually taken inside the plant, where no amount of washing will get them out.

With this in mind, researchers are working on ways of reducing the bacteria in cattle, to reduce the number of bacteria in the environment.

Dr. Brett Finlay of the University of British Columbia and Dr. Andrew Potter of the Vaccine and Infectious Disease Organization at the University of Saskatchewan developed a vaccine against the bacteria in 2001. Preliminary testing at the University of Guelph showed a 90 per cent reduction in *E. coli* O157:H7 excretion from the test animals, and large-scale field trials of about 36,000 Canadian animals show excellent results. Trials are currently underway in the U.S.

The Alberta Research Council and Bioniche Life Sciences Inc. are working on a commercial vaccine, expected to hit the market later in 2003.

While the vaccine may lower the incidence of *E. coli* O157:H7 from field to fork, a complementary approach promises even more safety. Dr. Roger Johnson, Head of the Research Section of Health Canada's

Laboratory for Foodborne Zoonoses in Guelph, is working on the problem with bacteriophages (literally, "bacteria eaters"). These viruses hijack bacteria's cellular machinery to reproduce, killing them in the process.

Phages have a long history in medicine, particularly in the former Soviet Union, where they have been used for decades to treat disease.

Johnson says it's critical to control *E. coli* O157:H7 at the source — and virtually all cattle come into contact with it at some point in their lives. He and his colleagues have developed a suite of phages to tackle *E. coli* O157:H7 and have tested them for effectiveness. The results have been submitted for peer review prior to publication.

Researchers at Evergreen University in Olympia, Washington have also discovered a new phage against *E. coli* O157:H7. Sheep resistant to the bacteria were found to be harbouring a previously unknown phage, which they named CEV-1. Initial results show it can completely eliminate the bacteria in 11 days.

According to Johnson, there is still much more work to be done on phages, but a product based on this strategy may be available in the next few years.

Sources: Dr. Andrew Potter, c/o VIDO at <http://www.vido.org>; Dr. Roger Johnson, c/o the Health Canada Laboratory for Foodborne Zoonoses at http://www.hc-sc.gc.ca/pphb-dgsppl/fz-llczoal/index_e.html; and the American Society for Microbiology at <http://www.asm.org/Media/index.asp?bid=17641>.



Is it something I ate, or just the flu?

Pity the poor Canadian.

During winter's short days and long nights, we crowd together inside. With the air inside the average Canadian home drier than the Sahara desert, our noses dry out, and we trade viruses like cold and flu. Once the weather warms up, bacteria multiply more easily on our food, and we get food poisoning – about 2.2 million of us every year.

So how do you tell the difference? One giveaway is with food poisoning, everyone gets it at once, usually from a single meal. The flu gets passed from person to person, so everyone is in a different stage of sickness or recovery.

Another difference is the symptoms themselves. When stricken with the flu, you'll get better over a few days; with food poisoning, you can get worse. Some bacteria produce toxins that attack the inside of your gastrointestinal tract. Bottom line: if you see blood, see your doctor.

Not all food-borne bacteria make you sick right away. *Clostridium botulinum* is fast acting, as it's already producing the poison that makes you sick (and, incidentally, is injected in minuscule amounts into people's faces to smooth wrinkles). *Salmonella*, on the other hand, has to multiply first, which can take a couple of days. *Listeria monocytogenes*, a nasty bug found in cheeses and luncheon meats, can take a month to actually make you sick.

The good news, if it can be said to be so, is that most cases of food poisoning will clear up on their own. The bad news is it can take days or weeks for your body to clear the bacteria away, and in some cases, it will get worse and you'll need to see your doctor. The best advice is still to remember the basics: keep hot foods hot and cold foods cold. Keep food covered. Thoroughly clean all food

handling tools and surfaces, including your hands. These simple steps will go a long way in preventing your barbecued treats from making your summer miserable. Now, if we could just do something about the mosquitoes and blackflies!

Sources: C-Health at <http://www.canoe.ca/HealthFoodSafety/flu.html>; Newtrition Central <http://www.canoe.ca/HealthMayeMuskColumns/011106.html>; Dieticians of Canada at http://www.dietitians.ca/english/faqs/faq_31.html; and the Canadian Food Inspection Agency at <http://www.inspection.gc.ca>.

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