

Dining could get safer with DNA technology

BSE detection possible with blood test instead of postmortem

By Tom Keenan - Business Edge
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The recent culling of nearly 60,000 turkeys from a B.C. farm and the voluntary recall of meat products from Alberta-based Hygaard Fine Foods reminds us that we are only a truck trip away from serious food safety trouble.

But DNA technology breakthroughs may soon help us to dine in relative peace, or at least know if we should be chucking that steak into the garbage bin.

Scientists at the University of Calgary have announced hopeful results for a blood test that will detect bovine spongiform encephalopathy (BSE, the so-called "mad cow disease") in living animals. Previously, diagnosis was only possible by looking at brain tissue post-mortem.

A team, led by Christopher Sensen of the faculty of medicine, has devised a simple and inexpensive blood test done on live animals that may detect the presence of BSE infection in cattle and chronic wasting disease (CWD) in elk months before clinical signs of the disease become evident.

Their test uses a form of DNA analysis called PCR, and they predict it could lead to an inexpensive way of testing live animals in the field. In an article in the journal *Nucleic Acids Research*, they suggest the test could be practical because pooled samples could be used on a large scale to eliminate infected animals from the human food chain. Other scientists in Winnipeg are trying to develop a urine test for BSE and other prion diseases.

Of course, hunting down the meat from infected animals is still going to be a problem.

IdentiGEN Ltd., an Irish company with North American offices in Lawrence, Kan., has some bright ideas about that. They've unveiled a DNA-based system to trace meat from farm to fork. It's a spinoff from scientific research done at Trinity College in Dublin.

The principle behind meat tracking isn't that new. Over a decade ago, French meat producer Soviba pioneered a system that gave cattle unique 10-digit tracking numbers worn on their ear tags.



Photo courtesy of U of C Faculty of Medicine
Bob Church, left, and Christopher Sensen are
study co-authors.

The accompanying *Passeporte* paperwork linked each retail package back to its producer. You could even go from that half-kilo of boeuf haché to a photo of the smiling farmer leading Bessie to slaughter.

According to IdentiGEN co-founder Ronan Loftus, few customers actually bother to check the origin of a package of meat. All that changes when your radio is suddenly warning of an outbreak of disease, or as happened recently in Ireland, a report that the hazardous chemical dioxin had turned up in pork and beef products.

In an interview, Loftus noted this had serious consequences for the Irish pork industry, and "may cost it up to one billion dollars, whereas beef farms that were also involved weren't impacted because they had effective traceability systems in place."

So, he says, food tracking makes good economic sense. It's mandatory in the European Union and in a number of Asian countries. He wouldn't comment on whether that will happen in Canada, but he clearly hopes it will.

IdentiGEN's DNA TraceBack system involves taking samples from animals in the field and sending them to a central lab for analysis and registration. Loftus says the additional cost would be "just pennies a pound."

"What's elegant about DNA is that consumers inherently understand DNA, and we can thank O.J. Simpson or CSI for some of that," he laughs. "People have a sense that DNA is incontrovertible, it's guaranteed, and all types of things. If that's positioned appropriately in the grocery chain, it can be very powerful, and we've seen that in a number of markets."

Alberta's Ministry of Agriculture and Rural Development (ARD) is collaborating with IdentiGen, Prairie Heritage Beef Producers and B.C.-based retailer Quality Foods on a pilot program to test the system. It includes consumer research to see if people really understand and care about food traceability.

The DNA TraceBack system can also be used to help verify marketing claims such as "organic" at the consumer level. Improving food security makes good economic sense, since Alberta's beef industry alone is worth \$2.2 billion per year.

Loftus recalls that the very first time he spoke about this in Canada in 2000, "people were saying: 'Why would you want to do that?'" "A lot has changed since then," he says. "People see the value, and consumers want to know more about where and how their food is produced."

He adds the system could easily be extended to poultry and even produce. During the 2007 tainted-spinach scare, a lot of people suddenly got interested in where their salad fixings had been grown.

If scientists can extract DNA from 3,500-year-old mummies, what else could they track? What if I wanted to know if that puppy is really a purebred?

"That's not necessarily the focus of our company," says Loftus. "But there are other companies that would use DNA technology in that way. I have some former colleagues who are involved in research to look at human ancestry. I am Irish, and they are looking at the level of Irish in Irish-Americans."

"I think DNA is going to impact on our lives in a lot of different ways."

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