THE CANADIAN PRESS

U.S. student sleuths use unique Cdn technology to identify mislabelled foods

By Alison Auld (CP)

Two American high school students have used unique Canadian DNA technology to identify numerous mislabelled food products in New York City markets, deepening concerns over the widespread problem of fraudulence in the marketplace.

From mislabelled fish to cow's milk being passed off as pricey sheep's milk, the Grade 12 students said a high percentage of the foods they collected as samples were not what they were said to be.

Brenda Tan and Matt Cost of Trinity School in Manhattan gathered about 150 DNA samples from foods and objects in their homes and neighbourhood as part of a science project with Rockefeller University and the American Museum of Natural History.

Tan said they found that 11 of the 66 fish, prepackaged and other food products bought largely at neighbourhood markets were mislabelled.

That included a specialty sheep's milk cheese that was actually made from cow's milk, venison dog treats made of beef, and sturgeon caviar that was really Mississippi paddlefish.

"You should get what you pay for," Cost said from New York before their findings are published in January's edition of BioScience magazine.

"We don't know where it occurs, but most of the mislabelling involves substitution of something less expensive or desirable, which suggests it's done for profit."

The students gathered the DNA samples in their apartments, supermarkets, their school and at fresh markets, finding that most of the hundreds of samples had detectable DNA even after being frozen, dry-cleaned or shipped thousands of kilometres.

They sent the samples to the natural history museum, which tapped into a databank of DNA bar codes that was pioneered by Canadian scientists at the University of Guelph in Ontario.

The Consortium for the Bar Code of Life project involves identifying a particular DNA sequence in marine and animal life that is unique to the species. That allows scientists to accurately identify the species and create a so-called bar code of its DNA similar to the black and white stripes on store goods.

The students submitted usable DNA from 151 of 217 items, including dried soup mix, dog biscuits, beef jerky, horse manure from Central Park and a feather duster.

"I didn't expect to find very much recognizable DNA, but it was astounding at the end of the project how much there is just lying around us," said Cost, 18.

The teens say they have discovered a possible new species of cockroach, a long-legged centipede that originated in Europe and an oriental latrine fly considered an invasive species in the southern U.S.

"DNA is resilient and it's everywhere and a great way to identify things in the 21st century," said Tan. "I mean, 10 years ago I don't think this would have been possible."

Bob Hanner, a biologist at Guelph who led the work on bar coding, praised the student project and said it shows the value of a technology that can be used to identify illicit goods at borders and track the spread of disease.

"It's another good example of how DNA bar coding can be used to engage students in real science questions, particularly like the market substitution problem," said Hanner, associate director of the Canadian Barcode of Life Network.

"It's continuing evidence along the lines of some of our earlier work showing what a powerful tool bar coding is."

The work follows up on the findings of two other Trinity School students in 2008, who found one-quarter of fish they bought at markets and restaurants in Manhattan was mislabelled.

Hanner said he's working closely with the Food and Drug Administration in the States to develop bar coding into an acceptable regulatory tool.

But he says Canada has been slow to embrace the technology as a way to discover contraband, mislabelled goods and possibly poisonous products.

He said the FDA and other agencies are sending their research scientists to Guelph for training in using the technology, but that "so far we haven't seen that kind of proactive development in Canada."

The FDA has adopted it for fish identification and also used DNA bar coding to distinguish the seed pods of star anise from another identical herb that contains neurotoxins.

The U.S. Agriculture Department is also working on a global database of DNA bar codes for fruit flies to deal with horticultural pests, and lumber products to identify endangered timber products.

Hanner is hoping as the technology gains ground, research continues into its use and the databank of species grows, it could soon be used to check goods at ports of entry.

He said he can soon see a time when people will be able to use tabletop devices at border crossings, schools and government departments to quickly identify a plant or animal.

"What would be the Holy Grail for a number of these agencies is to be able to do onsite bar coding," he said. "The technology exists. It just needs to be miniaturized."

Copyright © 2009 The Canadian Press. All rights reserved.