Geological Society of Australia
Earth Science Showcase

Monday 18 May 2009

Australian scientists—and tamper-proof fingerprint—at centre of global food crime fight

Australian Earth Scientists have joined forces with food scientists and chemists in an international effort to fight global food crime using new tamper-proof technology that pinpoints exactly where in the world particular foods have been produced—and they are calling on the Australian Government to now implement the technology.

The globalisation of world markets has increasingly led to fraudulent behaviour in the global food trade—including organised food crime—as some traders attempt to boost their profits by deliberately mislabelling substandard produce so it appears to have come from countries where foods are considered to be superior and free of contaminants, such as Australia and New Zealand.

But the new tamper-proof technology—which uses isotopic and trace element signatures unique to foods from individual regions across the world—can now provide a forensic fingerprint showing exactly where the food was produced, right down to a district level.

Once introduced, this technology will enable Australian and New Zealand producers to maintain their high-quality market niche while also protecting domestic consumers from sub-standard imports, according to Dr Anita Andrew, a member of the Geological Society of Australia (GSA) and an Earth Scientist involved in the development of the technology in the southern hemisphere.

“The security of the food supply chain has become a huge issue” said Dr Andrew, a Director of Sydney-based company Environmental Isotopes, speaking as part of the Geological Society of Australia’s *Earth Science Showcase*. “Consumers want to know where their food is coming from and that it is safe from pesticides and other contaminants. They are prepared to pay a premium for food whose origin is known and can be assured.

“Additionally, within the European and USA markets, there can be trade embargos, subsidies and tariffs that impact on what foods can be imported from what countries—regulators in these markets need to be able to check that their trade restrictions are being adhered to.

“Australia and New Zealand are major food exporters and trade on the ‘clean and green’ image of the food they provide to world markets. While there are paper-based systems designed to combat food fraud, such as country of origin labelling, this can easily be subjected to tampering—there are numerous examples of food products that have been produced in Asia but are labelled as products of Australia and New Zealand and then exported to Europe.

“The beauty of this new technology is that it identifies the origins of foodstuffs by the unique isotopic and trace element signatures that all foods have. These signatures are an inherent part of the foodstuff, specific to the particular regions in which they were grown, and tamper-proof.

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‘A career in Earth Science — a world of possibility’.

"Because food inherits the isotopic and trace element composition of its environment, these signatures can tell us many things about the region a particular food has come from, including its latitude and altitude, temperature and humidity, local agricultural practices, local industries, geology, the age and composition of the region's underlying bedrock, the continent from which the region first originated millions of years ago and—in the case of animal products—the isotopic composition of foods that the animal has ingested.

"Research undertaken recently in Australia by me and other scientists demonstrated that this technology is so sensitive it can pinpoint milk from different districts across the country, because the isotopic signature the milk carries is based on the different geology underlying the pasture that the cow ate! We can tell whether the milk was produced by cows close to the ocean, in irrigation areas, or in areas where there is abundant natural water, and we can also tell what type of pasture the cows were fed on.

"Every isotopic signature is a mixture of environmental signatures that are unique to each particular region right across the globe. It really is a case of the industry and food regulators being able to use this technology to sort out the good apples from the bad apples by pinpointing the region that the apples have come from.

"While the European Union has already introduced the use of chemical fingerprinting technology for some products within Europe, such as wines—and its further rollout is currently underway there—Australia is yet to follow suit.

"We believe a great first step would be the development of an Australian and New Zealand database of isotopic signatures to facilitate the accurate origin assignment of dairy products produced within Australasia—and in fact, the New Zealand Government has already commenced this work through the support of a start-up company, Oritain.

"Our strong message to the Australian Government is that this technology should now be introduced—it will bring huge benefits to food exporters as well as consumers."

Dr Andrew will speak at an international meeting on food traceability, GoTrace, to be held in Wellington, New Zealand, in July.

Dr Anita Andrew is available for interview. A photo of Dr Andrew is also available.

Also available for interview: GSA Executive Member, Dr Jon Hronsky, who can speak about Earth Science in general and the exciting career paths it can offer.

Media contact: Patrick Daley, Patrick Daley PR, tel: 0408 004 890.

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