

Participating hunters are applying RFID tags to animals harvested in the field, in order to improve traceability and the recording of health-related information.

By Dave Friedlos

May 24, 2010—The state government of Queensland, Australia, is funding a trial of radio frequency identification technology to track kangaroos from harvesting by hunters in the field to their arrival at a processing factory.

In February of this year, Tim Mulherin, Queensland's primary industries and fisheries minister, announced funding of \$61,000 to improve the traceability of wild kangaroo meat, and to adhere to the demands of overseas markets.



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Nick Swadling, the emerging industries development officer at the state's [Department of Employment, Economic Development and Innovation \(DEEDI\)](#), says the current paper-based tracking system is no longer adequate to meet international demands.

"The current system has been in use since the early '80s and, like many manual paper-based systems, is prone to problems such as omissions of information and errors," Swadling says. "An automated system, such as RFID, ensures accuracy of the information. It is increasingly a market requirement, in places such as the European Union, to have a high degree of accuracy and verification when harvesting animals to ensure health and safety information is accurate. A high degree of traceability is vital if we are to regain the Russian market or capture new, emerging markets, such as China."

Last year, Russia banned the importation of kangaroo meat from Australia, which accounts for approximately 70 percent of international demand, after a number of consignments were found to be tainted with *E. coli* bacteria.

The trial began this week and is set to run until the end of June. The wild kangaroos will be harvested by hunters in Goondiwindi, a town in southern Queensland. Four kangaroo hunters, who sell the carcasses to field depot operators, will apply some 2,000 tags, similar to small wristbands, to the legs of the animals they have shot. Two field depot operators, which purchase the carcasses from the hunters, will then read the tags upon collection before the animals are transferred to the Ipswich-based Game Meat Processing Co.

Each tag will be encoded with a unique ID number and a [Safe Food Queensland](#) accreditation number, in order to ensure each animal meets all industry and regulatory needs, such as the harvester's details and the length of time from the point of harvesting to refrigeration. Harvesters will be able to encode the

tags with additional information, such as the species of kangaroo, its sex, and a time, date and GPS location indicating when and where the animal was killed.

"It can also include the statutory declaration that the kangaroo was healthy at the time of harvest and was harvested humanely," Swadling notes, "which is another requirement of the EU market."

All kangaroos must be killed with a head shot, and each carcass is inspected before it is sent to the field depot for refrigeration. "It is a very comprehensive tag," Swadling states. "We are sure it will work. We just have to prove the expected benefits."

An economist will analyze the project and the system, and that information will be incorporated into a report on the project and its successes and failures. "An economist will examine the benefits, such as time savings and efficiencies, so meat processors will know exactly what benefits it will generate in the field," Swadling says. "We expect to see many benefits, including accuracy of information, speed of information transfer from tags to a database, speed of data entry and ease of use. It's about nailing down the robustness, efficiency and ease of use of RFID."

This will be the first time radio frequency identification has been used to track kangaroos or other wild game in Australia, though both Australian and New Zealand government agencies have employed the technology to track domesticated sheep and cattle. New Zealand's [National Animal Identification and Tracing](#) (NAIT) project aims to tag all cattle and deer with low-frequency tags, to improve the traceability of exported animals (see [New Zealand's National Cattle ID Project Gets \\$23 Million](#)). Meanwhile, the state government of Victoria trialed RFID across six farms, to investigate the economic benefits of tagging sheep (see [Australian Sheep Farmers Explore RFID's Benefits](#)).

[BCDS Identification Technologies](#), an RFID systems integrator based in New South Wales, has been chosen to conduct the trial, and the company has selected technology developer [Magellan Technology](#) to provide RFID tags and readers for the project.

According to Magellan's Roger Webber, the harvesting program will utilize passive 13.56 MHz high-frequency (HF) tags using Phase Jitter Modulation (PJM) technology that complies with the ISO 18000 Part 3 Mode 2 standard, and have 8 kilobits of memory.

"PJM technology provides very fast read and write capabilities—about 20 times faster than other HF tags," Webber says. "They also provide reliable read rates, even when tags are stacked close together."

The project will also use Magellan's Multiple Antenna Reader System (MARS) to read the tags. Two field depot operator workers will carry handheld interrogators out in the field, in order to encode a time stamp, the GPS location and other harvest details to the tag attached to a slaughtered kangaroo. Two handheld readers will also be utilized to record the movements of carcasses at a temporary storage facility, and again at the meat-processing center.

BCDS will host a central SQL database for the trial. At the field depots, a rugged mobile handheld computer running Windows Mobile 6.1 will upload information to the database in batch mode. If the project goes beyond the trial stage, BCDS plans to use a wireless wide area network (WWAN) radio to send transactional data back to the central database in real time.

In the main meat-processing plant, fixed Magellan RFID interrogators will read the animals' tags and update the database in real time.

The tags, Minister Mulherin says, will improve traceability, reduce the amount of paperwork and improve harvesting practices.

"We want to develop a cost-effective tag that will suit the requirements of all agencies and restore access to overseas markets," Mulherin states. "Industry stakeholders, including harvesters, processors and regulators, are supporting the trials because of the possibilities tags offer for opening market access and lowering costs."