Cecil Forsberg

PHOTO BY MARTIN SCHWALBE

When TECHNOLOGY is ahead of its time

Ontario Pork Puts Enviropig™ project into perspective

BY MARY JANE QUINN

It was back in the late 1990s when Ontario Pork first evaluated the proposal submitted on transgenic pigs from the University of Guelph. Enviropigs, as they were called, were identified as the world's first transgenic animals able to digest phosphorus in cereal grains.

Ontario Pork found merit in research that could enable pigs to utilize lesser feed stuffs like grass. It was anticipated that the meat from the pigs could be a valuable source of protein for humans in countries that are overpopulated, which had little to no land available for farming or had waste issues to address.

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The discovery also offered additional environmental benefits since the manure had lower phosphorus levels. With the University of Guelph owning the technology and Ontario Pork holding the trademark, the two organizations embarked on a mission to make genetic history.

Over the years, significant areas of development have occurred within the project. The first Enviropig™ was from an embryo that had been implanted with a phytase gene, which allows the pig to generate large amounts of phytase in one of its salivary glands. Phytase allows the pig to utilize phosphorus found in feedstuffs like corn and soybeans, ultimately helping to reduce waste output. Further testing showed that the gene was confined to only the salivary gland and not in the meat or manure produced.

As the project evolved, the researchers began implanting the phytase gene together with a regulator from a mouse gene. The mouse gene allows the trait to serve as a switch that turns on the gene and increases production of the phytase in the gland. Continued testing and monitoring showed that the pig could naturally reproduce its special qualities in offspring.

The goal has always been to explore practical options that would enable the use of the Enviropigs for industry and the environment in a positive way.

More recently, applications to the U.S. Food and Drug Administration, Health Canada, and Canadian Food Inspection Agency have all been submitted as human food and animal feed and these are awaiting approvals.

From the project's inception, it was hoped that the Enviropig would become commercially viable. Although there has been some interest in the concept from third parties, to date there have been no official offers to purchase the technology. Cecil Forsberg, professor emeritus in the department of molecular and cellular biology at the University of Guelph, says that "sufficient research has been completed to document the value of Enviropig genetics. Hope-

LEFT: Dave Hobson
RIGHT: Cecil Forsberg

fully, in the not too distant future, we will see an industry partner take over the project."

With the project at a standstill and minimal return on investment, Ontario Pork has had to make some tough decisions. "We had to look at our long-term investment strategy," says Stewart Cressman, chair of Ontario Pork's Research Committee. "If there is no industry acceptance and we have done all we can do, then I think it is in the pork producers' best interest to turn our attention and support to other research projects."

The University is planning to reduce the scope of its Enviropig™ research in the spring, when Ontario Pork's financial support ceases. Research will continue, but in a more cost-effective way that does not require the continual breeding and generation of live pigs.

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The university's business development office will continue to explore potential industry opportunities. This includes looking for new academic or industry partners or a receptor interested in taking the lead in commercializing the technology.

Swine research has and continues to be a priority and an investment for Ontario's pork producers. This includes research that may be controversial, but is nonetheless necessary if the industry is to be encouraged to adopt new and different ways of doing things.

Ontario Pork needs to balance current and future research to keep the industry moving forward. The Enviropig is just one example of how research can challenge conventional beliefs and offer global environmental solutions.

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