



Dr. David Hobson

# ENVIROPIG

## Is it ahead of the market?

Transgenic animals reduce supplemental phosphorous cost by \$1.50 per pig. They are also leaner, eat less feed and reach market weight 10 days sooner than conventional pigs

**A**fter 15 years of research, eight generations of breeding and three patent approvals, the Enviropig™ still hasn't hit the barbecue! The Enviropig is trying to get to market but how long it will take is still unknown. However, when it does get to market, China is the most likely market because, "the greatest need exists in China," according to Dr. David Hobson, Manager of Technology Transfer at the University of Guelph.

"The people of China love their pork which is considered a delicacy, and they can't produce enough of it domestically. In response, the central government has set goals to try to double the amount of pork available for consumption over the next 10 years, to feed the millions of people that are moving into the cities from the countryside," says Hobson.

BY MIKE MULHERN

"China has huge need for more pork as their population moves up the economic ladder to become the largest middle class population in the world. China has the greatest shortage of pork because they have significant water pollution, a shortage of land and water to produce more feed grain, accelerating food demands for more protein as people increase their wealth, and increasing reliance on commercial pig production as people choose to move into cities and give up producing their own backyard pigs," said Hobson. "Food and protein shortage is a serious problem that affects the social stability of China."

For the past three years, Hobson has been working with the lead inventor and scientist, Dr. Cecil

Forsberg, to find an industry partner willing to invest in the Enviropig. "We can only advance the technology so far," says Hobson, "then it is industry's job to take on the challenge of product development, new product launch, and regulatory approval to bring pork chops to the table, that will benefit farmers, processors, and indirectly the public by reducing the environmental footprint of commercial pork production. However, pleasing farmers, producers and the public, simultaneously, is no easy task. Price, productivity, environmental protection and most of all, acceptance of new technology are important issues that, in the end, must satisfy the paying consumer," lamented Hobson.

The Enviropig, developed from a Yorkshire-Landrace cross, was genetically engineered to produce

phytase enzyme in its own saliva so it could digest and absorb the indigestible plant phosphorus in soybeans and corn, resulting in lower phosphorus in its feces. Currently, conventional commercial pigs must have the same phytase enzyme added to their feed to grow properly. "The Enviropig does it on its own," Hobson said, "and the science indicates that the enzyme in the saliva works better than the enzyme added to the feed."

He also said the university wants to license the technology to companies "that are interested in marketing in China and the USA," adding that there are no restrictions on the licensing of the technology as long as regulatory approval is obtained from each country. In Canada, regulatory approval is required before the Enviropig can be used for human food, animal feed, and even as fertilizer. In February 2010, the Enviropig was assessed as "not toxic to the environment according to Environment Canada, as long as the pigs are raised in a secure facility," explained Hobson. Hobson and Forsberg recently met with the US-FDA to discuss their regulatory application for the USA. "Even though our application was submitted three years ago, the FDA has a lot of due diligence to complete before they will come to any conclusion and the environmental assessment will be more complex due to the large population of feral pigs in the southern USA," said Hobson.

## *Enviropig can save up to \$1.50 per pig on feed costs because it doesn't require phytase or phosphorus added to its feed.*

"As for China, we have not submitted a regulatory application due to the language barrier and because Chinese regulators require research to be repeated in China and we just don't have the funding to set up a research facility in China," he said.

"There has been a lot of interest from research institutes around the world willing to partner and collaborate," Hobson said, "but none have offered to provide funding upfront."

"The problem," Hobson says, "is that the technology is very much controlled by whoever owns the pigs and their genetics, so as soon as you share the genetics (live animals) with China, you lose practical control over future development." Several researchers in China and Taiwan have attempted to create their own Enviropig, but were unsuccessful. Hobson clarified the University's position by stating, "we are very eager to transfer all our knowledge and genetics to someone in China who is willing to make a serious effort to make the technology useful to Chinese society and industry. We are not looking

for collaborators wanting to create a research tool focused on satisfying their curiosity. We have created something very rare, a stable transgenic pig that could help the environment, and now we need an entrepreneur to take it from here."

What is the Enviropig worth is a big question. In China, Hobson thinks, "it could be worth \$100 million in reduced pollution over the next 10 years, but in the end everything is only worth what someone else is willing to pay for it, and as is the case with most of our research ... the technology is developing faster than the culture of the market." The Enviropig is focused on reducing pollution and currently in China there are few penalties for polluting. "It may take many years before China embraces environmental protection and more sustainable agriculture," Hobson said.

Specifically, the Enviropig can save up to \$1.50 per pig on feed costs (North American inputs) because the Enviropig doesn't require phytase or phosphorus added to its feed. An unplanned advantage of the Enviropig is that it is more efficient at converting feed into protein resulting in slightly leaner pigs which reach market-weight 10 days sooner compared to conventional pigs. 

RESEARCH FUNDING FOR THE ENVIROPIG HAS COME PRIMARILY FROM ONTARIO PORK, OMAFRA, AGRICULTURE AND AGRI-FOOD CANADA AND THE NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL OF CANADA.

### RESEARCH PROFILE

BY MIKE MULHERN



### **DR. DAVID HOBSON: Science and business merged in one career**

The University of Guelph's Dr. David Hobson has the title of "Manager, Technology Transfer, Business Development Office," which sounds more like an MBA than a PhD, but it's really a bit of both.

Hobson, 48, has a business and scientific background. He received his Doctorate of

Veterinary Science in lab animal science in 2008, his Doctor of Veterinary Medicine in 2001 and his Bachelor of Science in 1996, all from the University of Guelph. But he also had a life before vet medicine. In 1986, he earned his Bachelor of Applied Science in Mechanical Engineering from the University of Waterloo and, unknown to many, spent some time at Wilfred Laurier University and overseas at the Rotterdam School of Management in the Netherlands, before deciding to come to the University of Guelph.

He has worked for two national governments during foreign animal disease outbreaks as a temporary veterinary inspector, once for the United Kingdom's Department for Environment, Food and Rural Affairs in Yorkshire in 2001 during the foot-and-mouth crisis and again for the Canadian Food Inspection Agency in 2004 during the avian flu crisis in Abbotsford, BC.

On the business side, Hobson worked at McNeil Consumer Healthcare (a Johnson & Johnson company) in Guelph, as a production manager, assistant product director and project engineer. He also worked as a consultant for Schering-Plough in Mississauga and Agviro

in Guelph.

In his current role, Hobson manages, "the invention and commercialization portfolio for life science technologies with a focus on those developed at the Ontario Veterinary College and Animal Health Labs." In other words, he identifies, evaluates and patents inventions developed by academic researchers to maximize their commercialization potential and eventual transfer to industrial partners. Or as Hobson would say, "tech transfer for short, which means I have the privilege of picking and evaluating the best pearls of research from the university and selling them to industry." One of his current projects is enabling the commercialization of the Enviropig.

Hobson played varsity rugby for the University of Guelph when they were 1998 Ontario University Champions and was part of the Ontario Rugby All-star team in 1999. His hobbies include playing the stock market, fixing anything mechanical that is broken, hiking, camping, biking, skiing, scuba diving, kayaking, flying small planes, taking direction from his wife — also a poodle mechanic (vet) according to Hobson — and, most importantly, keeping up to his overactive kids aged one, three and five years.