

Enviropig™

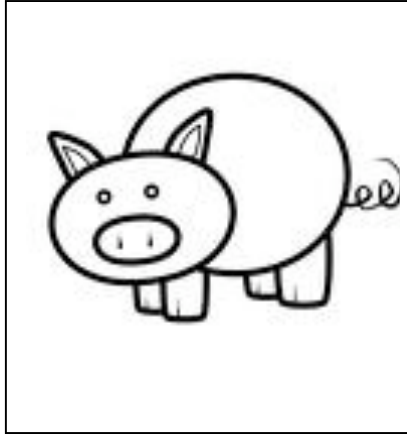
www.uoguelph.ca/enviropig

What is Enviropig™?

Enviropig™ is a genetically engineered to produce the enzyme phytase in order to digest plant phosphorus more efficiently, resulting in feces with less phosphorus.

A transgene construct containing a **mouse** protein promoter gene sequence and the Escherichia coli phytase gene was introduced into the pig chromosome by pronuclear microinjection.

"The pigs produce the enzyme phytase in the salivary glands and the phytase mixes with the feed (cereal grains) as the pig chews. Once the food is swallowed, the phytase enzyme is active in the stomach, degrading indigestible phytate in the feed that accounts for 50 to 75% of the grain phosphorus."



Is Enviropig™ "enviro"?

The researchers claim that Enviropig™ reduces feed costs and reduces the potential of water pollution from phosphorus (a major nutrient that cause algal growth and is the leading cause of fish kills):

But the environmental problems caused by excessive phosphorous are specific to intensive livestock operations. The problem is the model of high-intensity, large-scale hog production.:

"When the phosphorus depleted manure is spread on land in areas of intense swine production there is less potential of phosphorus to leach into freshwater ponds, streams and rivers."
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There are competitively priced feed supplements currently on the market that cut phosphorus:

"Since the Enviropig™ is able to digest cereal grain phosphorus there is no need to supplement the diet with either mineral phosphate or commercially produced phytase, and there is less phosphorus in the manure." www.uoguelph.ca/enviropig

But "...feeds supplemented with phytase for grower-finisher pigs and for pregnant sows may need little or no supplementary feed phosphate. Currently, adding phytase does not appear to add more cost to the diet ...Despite it being cost neutral, phytase use in Ontario remains at 20%-30% compared to 70% in Quebec...Using phytase, replacing protein with synthetic amino acids, and by feeding more closely to the animal's

requirements, nitrogen and phosphorus excretion in pig manure can be reduced by up to 50%." - Factsheet Nutritional Strategies to Decrease Nutrients in Swine Manure, OMAFRA

Who owns Enviropig™?

The University of Guelph owns the pigs and patents in the United States and China and is entitled to licensing revenue.

Ontario Pork holds the trademark and is the only outside private investor.

Ontario's pork producers have invested \$1.371 million and see China as a potential market. ("Enviropig clears another hurdle", Better Farming, Feb 24, 2010)

Ontario Pork is finalizing a commercialization agreement with the university that will allow it a share of the revenues generated from the technology.

Because the technology falls under an agreement the university has with **OMAFRA, the ministry would "receive a portion of any potential net revenue.** Ontario Pork would also likely receive a portion." ("Enviropig clears another hurdle", Better Farming, Feb 24, 2010)

Who at Uof G is involved?

Lead Scientist: Dr Cecil W. Forsberg, Professor Emeritus, Molecular and Cellular Biology

Commenting to Media: Steven Liss, Associate Vice-President for Research
Commercial Inquiries: David Hobson
Business Development Office

Contamination at Guelph: The Great 2002 Pig "Escape"!

In 2002, eleven piglets that had died at or shortly after birth were accidentally sent to a rendering plant and turned into poultry feed. The animals were not approved for use in rendering for animal feed, but accidentally contaminated 675 tonnes of poultry feed that was sold to egg farmers, turkey farmers and broiler chicken producers. The Canadian Food Inspection Agency ordered a recall of the feed. The then the UofG vice-president of research, Alan Wildeman, told the Globe and Mail that "Things you don't expect to happen can happen."

How close is Enviropig™ to commercialization?

Enviropig is one step closer to commercialization as Environment Canada's 2010 approval for controlled reproduction of the pigs will allow for production of the line and exportation.

Lori Bona Hunt, a spokesperson with the University of Guelph, says the university's business development office "is trying to find licensees, especially in China," which has been identified as "the country with the greatest need for this technology." ("Enviropig clears another hurdle", Better Farming, Feb 24, 2010)

UPDATE: In Feb 2010 Environment Canada approved the "new activity" of the production of the pigs in a controlled facility, segregated from other animals.

Where is Enviropig™?

The university's herd consists of about 12 animals that are housed in a high security, alarmed research building.

How much did Enviropig™ cost?

Lori Bona Hunt from the University of Guelph is reported to have said that the research project's total cost is in the millions but the number is confidential because the university is trying to find licensees. ("Enviropig clears another hurdle", Better Farming, Feb 24, 2010) At least \$1.371 million was invested by Ontario Pork.

How is Enviropig™ Funded?

"We currently are funded by Ontario Pork for safety testing leading to eventual commercialization."

Past and present funders: Ontario Pork; Ontario Ministry of Agriculture, Food and Rural Affairs; Rural Economic Development Program of the Ontario Government; Advanced Food Materials Network; Natural Sciences and Engineering Research Council; Agriculture and Agri-Food Canada

University of Guelph provides the expertise and facilities.

For info: www.cban.ca

