

Scientists improve transgenic 'Enviropigs'

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A research team at the University of Guelph has developed a new line of transgenic "Enviropigs." The new line of pigs is called the Cassie line, and it is known for passing genes on more reliably. The results of this project were published ahead of print in the *Journal of Animal Science*.

Enviropigs have genetically modified salivary glands, which help them digest phosphorus in feedstuffs and reduce [phosphorus pollution](#) in the environment. After developing the initial line of Enviropigs, researchers found that the line had certain genes that could be unstable during reproduction or impractical in commercial use.

Scientists at the University of Guelph created the Cassie line to address these problems. In their paper for the [Journal of Animal Science](#), they explain that the Cassie line has the same ability to digest high levels of phosphorus in [plant matter](#).

Phosphorus is crucial for healthy growth in pigs. Unfortunately, 50 to 70 percent of the phosphorus in grain is in the form of phytic acid, a compound indigestible by pigs. Because of this, many farmers have to supplement pig diets with an enzyme called phytase. Phytase breaks down phytic acid and helps pigs digest more of the nutrient. The phytase enzyme has a hefty price tag for farmers, and the enzyme can be accidentally damaged or destroyed when farmers mix feed.

The Enviropig was created to solve this problem. The transgenic pig synthesizes phytase in its salivary glands, eliminating the need for additional supplements or enzymes in the feed. By digesting more

phosphorus, the Enviropig also produces less phosphorus in its waste.

"The enzyme is secreted in the [saliva](#) and functions in a similar fashion to that of phytase included in the diet," said Dr. Cecil Forsberg, Professor Emeritus, Department of [Molecular and Cell Biology](#) at the University of Guelph and co-author of the study.

Though no studies indicate a [food safety](#) risk from genetically modified Enviropig pork, meat from the Enviropig is not yet available for human consumption. Forsberg said using Enviropigs could improve food production and the environment.

"When transgenic food animals are accepted by consumers, the Enviropig perhaps would be one of the first innovations to be introduced into swine production," said Forsberg. "We have demonstrated that the gene can be transferred by breeding through many generations in a stable fashion. Furthermore, the pigs are healthy."

Research on the Cassie line stopped in June 2012, but researchers collected semen from the [pigs](#), and they have the option to breed new Enviropigs.

More information: This paper is titled "Digestive utilization of phosphorus from plant based diets in the Cassie line of transgenic Yorkshire pigs that secrete phytase in the saliva." It can be read in full at journalofanimalscience.org.

Provided by American Society of Animal Science

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