



Research on Pig Health is Irresistible

By Geoff Geddes, for Swine Innovation Porc

No pork producer wants to handle a 300 lb pig with a fever. It's not a pretty picture, and neither is the bottom line for the producer when the herd is sick. That may be why the industry is excited about the potential of a research project for harnessing genomics to improve disease resilience and sustainability in Canadian pork production.

If an animal is not in good health, there's no chance for it to express its genetic potential. And, due to the low heritability of health traits, it was always thought that genetics couldn't contribute to disease prevention.

That thinking changed with the advent of genomics and research efforts like the "Application of Genomics to Improve Disease Resilience and Sustainability in Pork Production" project.

"All animals are susceptible to disease, but those with resilience will recover faster and have less effect on production," said Dr. Graham Plastow, Professor, CEO - Livestock Gentec Centre, Agricultural Life and Environmental Sciences, Agricultural Food and Nutritional Science at the University of Alberta.

Bracing for impact

Dr. Plastow defines resilience as the ability of an animal to respond to any disease challenge in a way that minimizes its impact. It's a con-

cept that's easy to grasp even if you're not a scientist, as long as you have experience with sickness.

"We see in humans that some people get the flu, go to bed and drink fluids and are back to work in one or two days. At the same time, others with the exact same condition may be laid low for weeks before they recover. For the purposes of this project, we are interested in pigs that take a break when they're sick, but then are up and active again quite quickly."

Pig disease can plague the bottom line

As fascinating as the phenomenon of resilience is to researchers, it's equally interesting for pork producers, and for good reason: animal disease represents a sizable expense to the pork industry. Though feed costs get most of the attention these days, the economic impact of health issues in terms of treatment and mortality is often underestimated.

Fortunately, researchers appreciate the toll that a disease challenge can take on a farm, and are determined to harness the power of genomics in addressing the problem; to accomplish that, however, they face challenges of their own.

Exporting genetics, not disease

"When we look for variation in resilience or

“WHEN WE LOOK FOR VARIATION IN RESILIENCE OR SUSCEPTIBILITY TO DISEASE, THERE IS DEFINITELY A GENETIC COMPONENT. [PART OF] OUR RESEARCH IS CREATING NEW TESTS TO ASSESS THE STRENGTH OF AN ANIMAL’S IMMUNE RESPONSE.”

susceptibility to disease, there is definitely a genetic component. For breeding companies, though, it can be hard to get a hold of that variation as we try and keep the nucleus herds that produce genetic improvements as healthy as possible. In part, this is because we want to export our genetics around the world, and we can't do that if they take disease with them. Also, because we are generally selecting for genetic potential, we keep disease away so we can select the best animals with the best potential.”

The conflict arises as you go down the production pyramid: you have more pigs, more farms and more pathogens, and it becomes harder to maintain biosecurity. As well, some clinical diseases tend to be more severe on the lower rungs of the pyramid.

“For those reasons, we are trying to discover with this project how to develop new tools to identify the genetic potential of animals in those high health environments, while also predicting the performance of their offspring in commercial herds where disease challenges are greater. That is a unique element here, and it's why a key component of our research

is creating new tests to assess the strength of an animal's immune response. These are animals that are not exposed in the nucleus herd, but we look at what we can do through introducing disease to explore their potential immune response when they are challenged.”

When it comes to enhancing disease resilience through genomics, research doesn't yet have all the answers. But by asking the proper questions, they're moving in the right direction, towards healthier pigs and a more robust bottom line for producers. 😊

To learn more....

For more information, please contact Graham Plastow at : plastow@ualberta.ca.

This research was part of a larger project titled *New tools to enable effective genomic selection for disease resilience*. Find additional resources related to the project by consulting our website:

www.swineinnovationporc.ca/research-animal-health

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