

Part two: Genomics and Swine Health: The Next Steps

Building on the work of Plastow and his team described in Part I, a new research project hopes to provide novel strategies for reducing disease impacts by applying genomic technologies to develop and optimize selection strategies for resilient pigs. It will also enhance overall disease resilience of pigs by providing new results that improve nutritional and microbial management at the production level.

Project leaders Dr. Michael Dyck (University of Alberta), Dr. John Harding (University of Saskatchewan) and Dr. Bob Kemp (PigGen Canada Inc.) are focusing on four major areas of study:



Michael Dyck
Photo by Meristem

1. Animal Models:

In order to study disease resilience and define the resilience phenotype, different animal models are being studied. One of the project's key goals is to better predict the health and productivity of pigs in commercial environments

based on samples obtained while in their high-health source farms.

2. Host-microbial Interactions: Researchers want to identify microbial gut colonization patterns in a large population of pigs, as well as the gut microbiomes associated with immune response to vaccination. In doing so, they hope to determine the optimal gut microbiome associated with health and appropriate immune response.

3. Genomic Analysis: At all stages, this project will collect a large number of samples for genomic analysis to determine the gene profile and gene expression that are associated with the disease resilience in pigs. This information will help develop

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Bob Kemp

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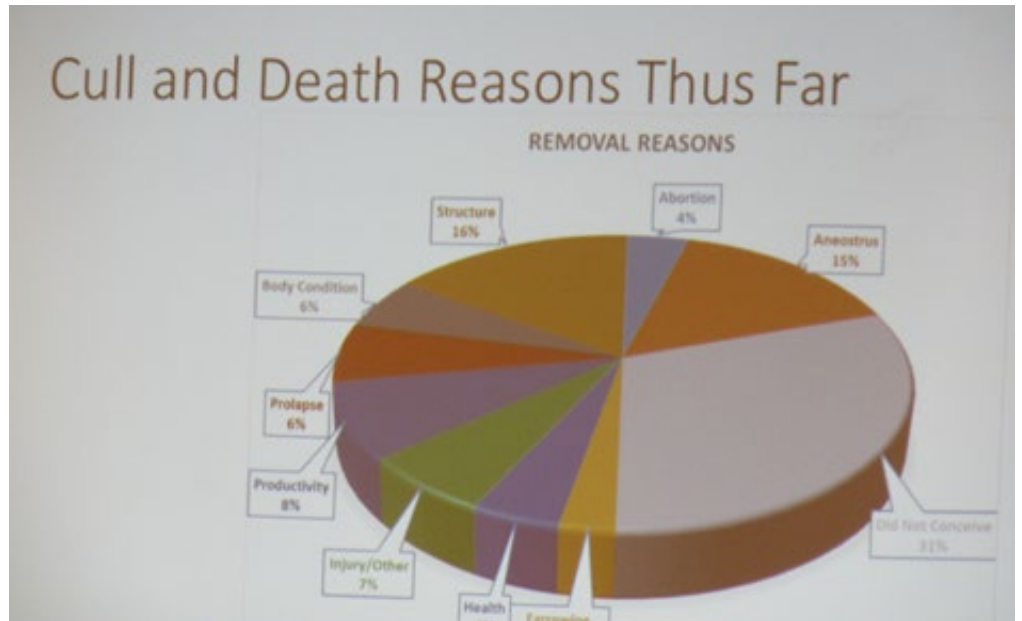
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the Genomic Estimated Breeding Values for improved pig health and resilience, as well as optimize commercial management strategies for reducing the impact of disease on resilient pigs.

4. Socio-Economic Analysis:

The purpose of this analysis is to identify and measure the social value of using genomics in breeding for disease resilience, for Canadian and global markets. This will help determine the best approach to pig health optimization: the development of vaccines, more specific antibiotics or breeding for disease resilience.



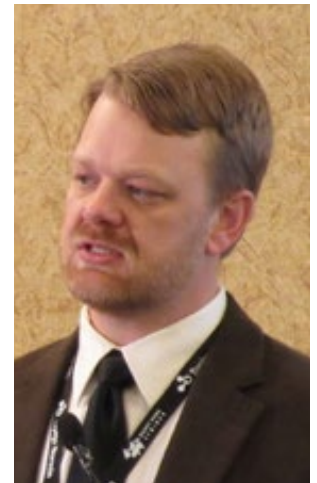
Industry implications

Ultimately, researchers hope to improve the end-user’s ability to select, feed and use microbial management tools for the optimal immune response of pigs. This should help Canadian

producers meet rising global pork demands by improving health and productivity while reducing the use of antimicrobials in pork production. Now THAT’S a good icebreaker.

Part three: Impacts of Moving “Clean” Gilts into “Health Challenged” Commercial Sow Farms: Gilt Acclimation Project

Plastow’s work and the latest Genome Canada project outlined in Part II have demonstrated that genetic variations in animals can produce differing levels of resistance to infectious diseases. However few studies have been undertaken combining multiple diseases. Led by Dr. Benny Mote, assistant professor, swine extension specialist at the University of Nebraska-Lincoln, this study followed over 3,000 gilts as they transitioned from high health multiplier farms to cooperating commercial farms where the females would encounter a number of natural disease loads. Genome-wide association studies identified regions of the swine genome controlling the most commercially relevant diseases.



Benny Mote

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