



Genomics Lets Pork Industry Be Selective

By Geoff Geddes, for Swine Innovation Porc

If you could build the perfect life partner, what would they look like? The correct answer is “he/she is perfect already,” but what about the perfect pig? While perfection may be out of reach, advances in genomic research are putting high performing pigs well within the industry’s grasp. This is evident in the project “Demonstration of use of genomics to predict and enhance pig performance and carcass value,” part of a larger group of studies on applying novel technologies to the pork industry.

“One of the original objectives of the overall project was studying genomics as a novel technology,” said Brian Sullivan, CEO of the Canadian Centre for Swine Improvement. “The focus was on being able to measure new traits for pigs and carcasses and use genomics to improve those traits.”

The more the merrier

Specifically, researchers sought to accomplish two goals. The first was genotyping a large quantity of animals to use as a reference population. This enabled scientists to sift through more than 50,000 genetic markers and determine how those markers are associated with traits of interest to producers.

“As an example, let’s say there are 300 genetic markers linked with tasty pork. For each of those markers, there are two possibilities: a pig has the one favorable or unfavorable to good taste. Once you know which markers are most closely tied to flavorful pork, you can

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genotype young pigs, look for the ones with the highest frequency of those markers and select for those pigs in the future.”

Tasteful choices

Certain traits like tasty pork are hard to assess by traditional means, as without genomics, you have to slaughter the pig to assess the quality of the pork, robbing producers of any breeding potential from that pig going forward. Genotyping is also useful for traits like longevity, which you can’t measure until an animal is older. In fact, harnessing the power of genomics can aid

in selecting for any carcass or pork quality trait. That was the motivation for assembling a large data set, to give researchers the best possible chance of selecting for those traits that industry really cares about.

“We have a sizable reference population now and have genotyped about twice as many animals as originally planned. When you combine that with our existing genotypes, new ones coming in with other projects and ones being shared by the private sector, it will increase the accuracy of our predictions for the next generation of pigs.”

Getting testy

Gauging that accuracy was the project's second objective, as researchers tested the technology on young pigs to predict performance and determine how well the genomic predictions worked. Using herds from across Canada, they found a large increase in accuracy – in the 30% - 40% range – for traits you can easily measure on pigs. With traits that can't be measured on the breeding pig such as pork quality, or that can only be assessed later in life, such as increased litter size, better piglet survivability and greater longevity, the improvements in selection precision will be huge.

“Having the genetic option is a tremendous advantage for breeders, because the decision on which pigs to breed must be made at 6-7 months of age. Otherwise, all you have to go by are growth and ultrasound data, and you

won't have relevant information on individual candidates until long after those decisions have been made. Genomics puts us in position to make crucial decisions before breeding the animals, something that could have a considerable impact on the bottom line.”

As well, genomics gives industry the ability to select for new traits. If Canada wants to add pork quality attributes for the Verified Canadian Pork label, this is a tool to improve aspects such as marbling, color and drip loss, or any other traits known to be heritable. It is technology that simply didn't exist in the past, but that could play a large role in shaping the pork industry's future. 😊

To learn more....

For more information, please contact Brian Sullivan at brian@ccsi.ca.

This research was part a larger national project titled *Use of novel technologies to optimize pig performance, welfare and carcass value*.

You may find additional resources related to the project by consulting our website:

www.swineinnovationporc.ca/technology

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