



Brachyspira 2.0: Novel Disease Needs Novel Approach

By Geoff Geddes, for Swine Innovation Porc

The last thing you want to hear when visiting the doctor is “wow, we’ve never seen anything like this before.” So imagine how swine vets and scientists felt recently when a novel species of *Brachyspira* (*Brachyspira hamptonii*), which causes severe illness in pigs, was detected. At the same time, *Brachyspira*-associated disease has re-emerged as a serious cause of morbidity and financial damage for the Canadian swine industry. Against this backdrop, researchers have developed tools to arm the industry in its fight against this disease.

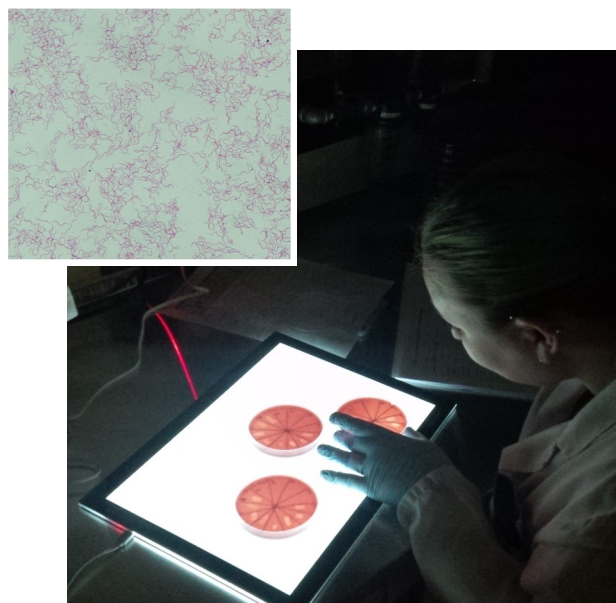
The effort began with learning more about the *Brachyspira* organism and its resistance to antibiotics.

Where there’s a pill, there’s a way

“We wanted to provide laboratory guidance for practitioners in the field to help them choose the best drugs for the pigs they’re working with,” said Dr. Joseph Rubin, Assistant Professor - Department of Veterinary Microbiology at the Western College of Veterinary Medicine.

As part of the *Brachyspira* Research Group at the University of Saskatchewan, Dr. Rubin worked to develop standardized methods for tests to determine if antibiotics are effective against this type of bacteria. That was no easy task given that the handful of labs worldwide addressing this issue were all using their own in-house techniques.

“In order to collaborate among labs, we needed to publish a test methodology that everyone



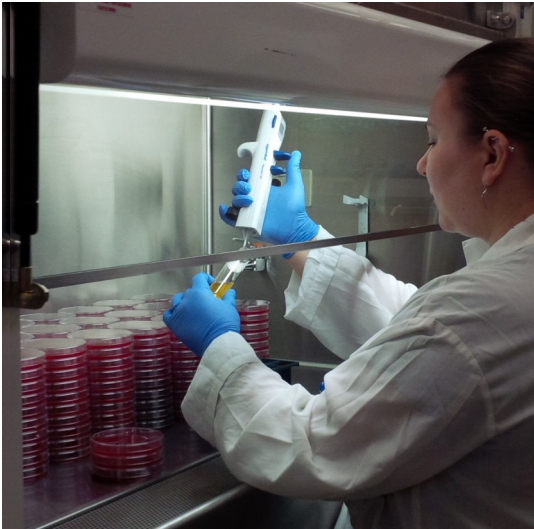
Top: Gram stain of *Brachyspira hamptonii*.

Larger photo: Reading susceptibility test in the lab.

Source: University of Saskatchewan

could use so we could compare results one-on-one rather than having an ‘apples and oranges’ dilemma. That would give us a good picture of how resistance conditions differed among countries.”

At the same time, researchers were able to test a good-sized collection of *Brachyspira* isolates and generate baseline data. When new cases of the disease are reported, they can compare them with the isolates to see if resistance is emerging. Researchers are now using these newly developed techniques to test *Brachyspira* isolated from samples submitted from sick pigs in the field.



Performing susceptibility testing in the lab.
Source: University of Saskatchewan

Benefit plan

While it's a large investment of time and resources, the payoffs for producers could be numerous.

"The most tangible benefit is that we now have laboratory evidence to support veterinarians in using the correct drug at the proper dosage from the outset. This should reduce disease mortality and the economic losses associated with that."

It will also save money for producers by only using one drug instead of hitting them with a bill for several products in order to find the right one.

Equally important are the intangibles, such as the boost to animal welfare when the duration and/or severity of disease are reduced. And while happy animals are a good thing, this research should also please another species that's vital to the industry: consumers.

"The data we gather lets us demonstrate to people that antibiotics are being used prudently and based on sound evidence. This will help industry address concerns from the general public and health officials around anti-microbial resistance by limiting the effects of swine production on that growing issue. It's a huge focus right now as we hear more in the media about things like antibiotic-free meat. Being able to only use these drugs when needed and in the most targeted way possible can help answer tough questions from the public and provide concrete proof that we're doing the best we can in that regard."

An attitude of gratitude

With all the potential positives from this research, it's easy to forget where it all began, but Dr. Rubin is not about to do that.

"None of this would have been possible without funding from Swine Innovation Porc, Elanco and Agriculture and Agri-Food Canada, so I want to express my gratitude for their support."

And if this research lives up to its promise, Dr. Rubin and his colleagues may soon be fielding some "thank-yous" of their own. 🙏

For more information....

For more information about the work described in this article, please contact Dr. Joseph Rubin at joseph.rubin@usask.ca

You may find additional resources related to the project *Towards the development of a method for determining the antimicrobial susceptibility of Brachyspira* by consulting our website:

www.swineinnovationporc.ca/research-animal-health

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