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## Going Whole Hog

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*Institute helps researchers develop  
detection tools for deadly swine diseases*



Going whole hog



Major breakthroughs in swine disease research from Kansas State University's Biosecurity Research Institute have underscored the institute's relevance in infectious disease research both today and in the future.

"The Biosecurity Research Institute isn't just changing research at our university, but everywhere," said Raymond "Bob" Rowland, professor of diagnostic medicine and pathobiology at Kansas State University's College of Veterinary Medicine. "The institute is a university resource, but it's also known as a worldwide resource."

Rowland is working with Richard Hesse, associate professor of diagnostic medicine and pathobiology and director of diagnostic virology at the university's Veterinary Diagnostic Laboratory. Together they are further developing the safe detection of infectious diseases.

Rowland and Hesse are using a swine oral fluids test for infectious disease agents like the classical swine fever virus and pseudorabies. Not only is the test noninvasive, but the method for collection makes it easy to get samples from up to 30 pigs at a time.

Rowland said that most of the material in oral fluids is saliva, but blood vessels lining the tissue of the pig's mouth can leak, allowing a sample to be taken.

"When you collect an oral fluid sample, you throw a rope into the pen and the pigs fight over it," Rowland said. "We get a sample that represents a population of pigs. This is one of the new revolutions in surveillance. The work we're doing at the institute is developing the tools needed to detect high-consequence agents."

Rowland said that the research focuses on detection and surveillance, rather than symptoms. This research will help herds remain healthy and avoid disease.

Hesse and Rowland's upcoming research will revolutionize the science of swine disease detection and surveillance.

"The viruses we're using don't make pigs sick," Rowland said. "We're looking at the most sensitive levels of detection — viruses that establish low levels of replication. This new technology allows us to take a single oral fluid sample and test it simultaneously for as many as 50 different infectious disease agents."

As the technology for these tests is prepared, Rowland said the Biosecurity Research Institute also will play a major role in the next step in swine disease research: genetics.

"We've heard a lot about sequencing the human genome, now we're doing the same thing with pigs," he said.

The Biosecurity Research Institute will be imperative in genetic studies because of its capabilities for studying large herds. Rowland said they want to find genes that help pigs respond better to a vaccine as well as develop vaccines for diseases for which there are none.

"We look at the quality of the product," Rowland said. "If you eat meat, you want to make sure it's tender, flavorful and healthy. You have to breed in all of those qualities, and we want to make sure that when we breed in the good stuff, we don't accidentally breed in the bad."

The Biosecurity Research Institute was built to adapt to developing research. Recently, Rowland was part of a research team that discovered a genetic marker that identifies pigs with reduced susceptibility to porcine reproductive and respiratory syndrome, or PRRS. The disease costs the U.S. pork industry more than \$600 million a year.

This research was completed in a biosafety level-2 facility, and Rowland said it could be translated directly to the Biosecurity Research Institute's biosafety level-3 facility.

"That's going to be the ultimate power — doing something that no one else can do," he said. "When we look at what the institute is well suited for, we're headed toward genetics."