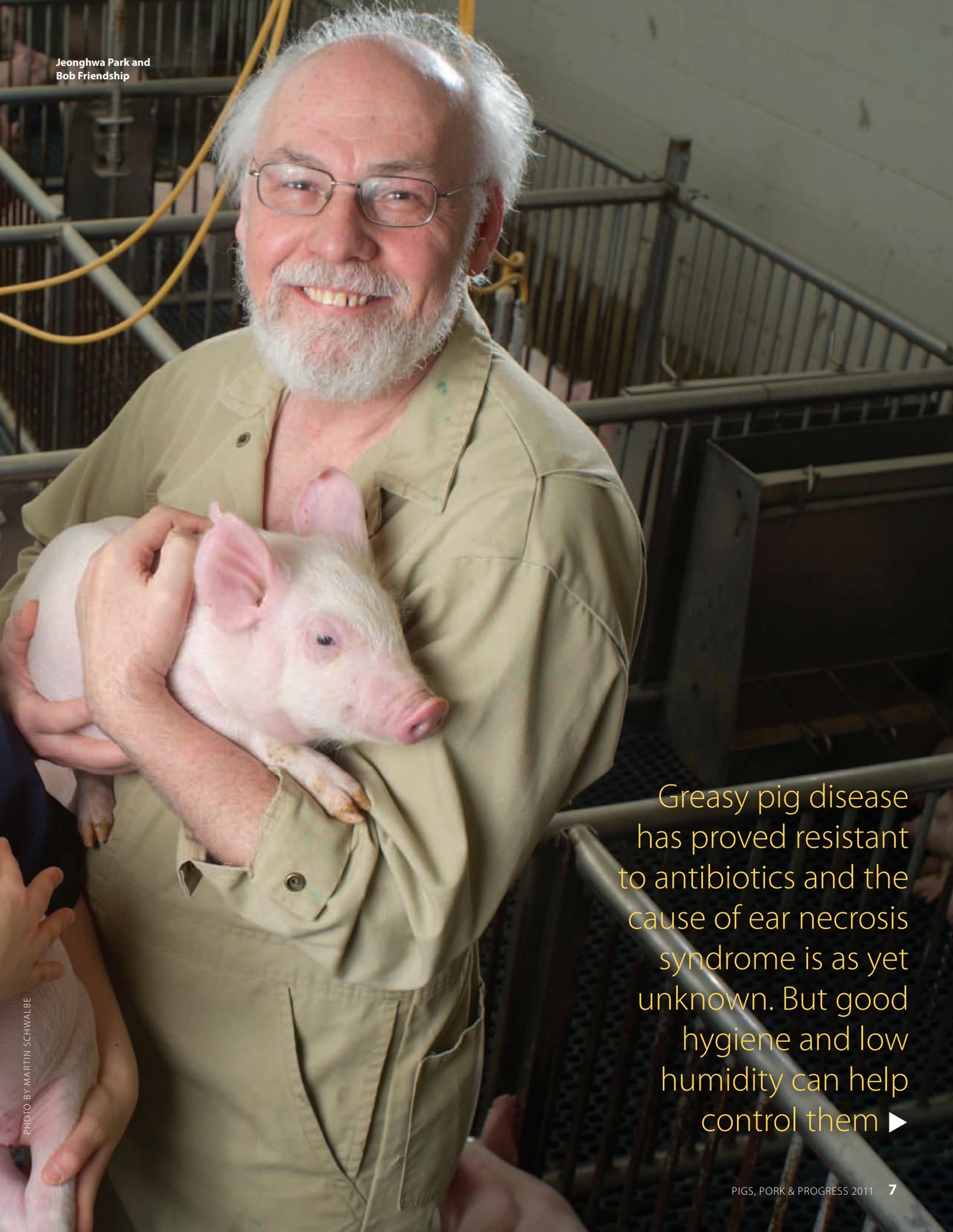


GREASY PIG & EAR NECROSIS

TWO DISEASES
PROVING
DIFFICULT
TO TREAT

BY MIKE MULHERN





Greasy pig disease has proved resistant to antibiotics and the cause of ear necrosis syndrome is as yet unknown. But good hygiene and low humidity can help control them ►



Greasy pig disease is an old problem that may be making a comeback and ear necrosis is a more recent concern. But these two skin diseases of pigs may have a lot in common, according to Drs. Jeonghwa Park and Robert Friendship.

"We know a lot about how greasy pig disease occurs," says Friendship. The primary causative agent is the bacterium *Staphylococcus hyicus*, which is found on pig skin everywhere. For example, damage to the skin when newborn pigs fight over a teat or newly weaned pigs struggle to establish a pecking order allows the *Staph* to invade the wound and possibly release toxins to cause the severe skin outbreaks. Over the years, attention to hygiene and the environment has greatly reduced the prevalence of this disease, but in the last few years there have been changes that have made this disease more of a concern.

Friendship, a professor in population medicine at the Ontario Veterinary College, University of Guelph, and his graduate student Park are part of a group studying greasy pig disease. They have been looking for explanations as to why the disease seems to be more common and harder to treat than it used to be. One obvious reason for the rise in prevalence is that many farmers have chosen not to clip needle

teeth at birth. In addition, litter size has increased in the last few years, so competition for teats is high.

The most remarkable finding by this group of researchers was that all the *Staph* bacteria examined from cases of greasy pig disease were resistant to penicillin, the antibiotic most farmers use to treat the disease. In fact, all the drugs in the penicillin family appeared to be ineffective based on lab tests.

The researchers explored this further to show that some of the *Staphylococcus hyicus* from greasy

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pig disease cases were carrying the same genetic material that allowed *Staph aureus* to be resistant to methicillin and other antibiotics. *Methicillin resistant Staph aureus (MRSA)* has recently been reported to be common on pig farms, but this research suggests that similar antibiotic resistance might be interfering with the treatment of greasy pig disease.

How this resistance is passed from farm to farm and possibly from one bacterial species to another needs to be investigated. It should be pointed out

that a number of farms participating in this work were not using antibiotics. The resistance appears to spread and persist regardless of antibiotic pressure.

"Penicillin isn't going to work," Friendship says. "Just don't use it." He recommends that farmers do culture and sensitivity work to determine what will be effective in fighting the infection in their barn. "Producers should see what works on their farm," he says. "They would certainly do that for other diseases like *E. coli*, but I don't think they have been doing

it for greasy pig."

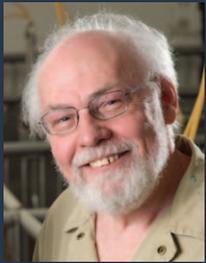
Friendship says that, as for most pig diseases, there are management and environment factors that contribute to the severity of greasy pig. For example, humidity needs to be kept low and hygiene needs to be good. Skin wounds can be treated promptly with antiseptics to prevent *Staph* infections.

Possibly related and also common on pig farms is ear necrosis syndrome, which exhibits as tissue damage to the tips of ears. The damage can vary from a very small sore to the loss of most of the ear.

Population medicine researchers are trying to find the cause and one suspect is *Staph hyicus*. Another is *Treponema (spirochetal bacteria)*. "These organisms," researchers say, "have also been found in the ear lesions and the mouths of pigs with ear necrosis, but they may be secondary invaders. Ear

Continued on page 8

BOB FRIENDSHIP: Leading a Number of Projects



Dr. Robert Friendship is a busy man. As the University of Guelph research liaison for the Ontario Pork industry, Friendship is always on the cutting edge of identifying new areas of swine research and development. Some

of his latest work includes the investigation of a possible new disease called peri-weaning failure-to-thrive syndrome (PFTS).

"We think we have identified this syndrome on a few farms in Ontario but the disease is as yet not clearly defined and the causative agent, if it is an infectious disease, is not known. The name of the syndrome describes the main clinical sign, pigs that look good when they enter the nursery rapidly lose body condition," Friendship said, adding that peri-weaning is that period just before or after weaning.

The research is sponsored by the Canadian Swine Health Board and Friendship is the principal investigator. "I am working with Dr. Josepha DeLay and others in the Animal Health Laboratory here and they are going back over some of the samples and looking, in a retrospective way, for evidence that this disease has occurred. This will be coupled with phone calls to veterinarians and producers to get a more detailed history associated with these samples." He said the study will likely take about two years and will include a number of researchers.

"Prospective work is going to tie in with a project being headed by John Harding (associate professor, swine production medicine, University of Saskatchewan in Saskatoon)," Friendship said. "It involves some diagnostic labs in Iowa, Saskatoon and elsewhere, a North American look to see how widespread this is and see if we can nail down what it is."

"It's a little bit ill-defined now," he said, "all new diseases are." He added that this may or may not be a real disease. "What we are seeing may be a little bit different from what Iowa is seeing, or what John Harding in Saskatchewan is seeing, so we may have a whole bunch of different diseases or different problems. What is great is that we have such a vast pool of resources and research in North America that we can collaborate and share our findings."

A second project sponsored by the Canadian Swine Health Board will take a look at whether the antibiotic tilmicosin has anti-viral properties that are useful in treating Porcine Reproductive and Respiratory Syndrome (PRRS).

Friendship said veterinarians have been frequently prescribing tilmicosin, a feed additive, when a herd is having a severe outbreak of PRRS or when they decide to do an inoculation with a field strain virus to build herd immunity by spreading the disease through the herd.

"PRRS being a virus," Friendship said, "an antibiotic shouldn't be of any value, except possibly to limit secondary bacterial infection but there has been a bit of work done in the lab suggesting tilmicosin might have some anti-viral properties and that, in some cases, has been extrapolated to mean it is useful in treating PRRS."

"It is becoming common practice to use tilmicosin versus other antibiotics because of its presumed anti-viral effect but nobody has done the field trials to prove its value," he said.

Friendship said he will conduct a trial where pigs are injected with the live vaccine strain and their blood monitored for the presence of PRRS virus. Half the pigs will be treated with tilmicosin and half won't to see whether the antibiotic reduces viral levels in the blood of pigs treated as well as what effect the antibiotic has on the immune cells in the lungs. He expects to have an answer within a year.

A third project, supported by Agriculture and Agri-Food Canada and Ontario Pork, also involves a number of researchers from across Canada and is part of a large program called the "swine research cluster." The three-year project will look at sow longevity, sow welfare and sow lameness issues. This project includes work on gilt development as well. The overall objective of this work is to look at the factors that may lead to premature culling and reasons for sows not achieving their maximum potential. This project is headed by Laurie Connor from the University of Manitoba and Nicolas Devillers, from AAFC in Lennoxville. Other Ontario collaborators include Paul Luimes from Ridgetown College and Renee Bergeron from Alfred College.

A fourth project concerns food safety, particularly salmonella infection of finishing hogs. This is an area that Friendship has been involved for many years, and is working closely with his post-doctoral fellow, Dr. Vahab Farzan. Their main focus is on vaccination as a solution. Dr. Farzan's position is supported by MITACS and Boehringer-Ingelheim. Other potential solutions that are being looked at by Friendship and Farzan are probiotics and herbal products (essential oils), in collaboration with Agriculture Canada researchers Joshua Gong and Qi Wang. "Certain probiotics and some herbal products work well in the lab but in our experience the results in the field are very inconsistent," admits Friendship and adds that their efforts will be to continue to experiment with delivery systems, concentrations and combinations until the results are predictable. This work has been supported by AAFC, Ontario Pork and OMAFRA.

Continued from page 6

tip lesions attract the attention of other pigs and the bacteria in the mouths of pigs may infect the initially mild wounds and thus create a more severe disease."

Friendship says that ear necrosis is a post-weaning disease. "I've never seen it in suckling piglets. It's always after weaning and sometime several weeks after weaning."

Researchers have found it occasionally in pigs at three weeks, but it's most common in pigs five to 16 weeks of age. Sometimes only a few pigs are affected and the lesions are barely noticeable, but there are outbreaks where all the pigs are affected and many with extensive lesions. The disease does not result in mortality, but can make it difficult for a farmer to sell feeder pigs.

This is a disease that seems to be increasing in prevalence. The cause remains unknown and it has not been completely accepted that it is an infectious disease.

"It's been an issue for a number of years as to whether ear necrosis is an infectious disease or whether it's just ear biting," says Friendship. "We're talking about an infection that starts usually at the tip of the ear, the tissue becomes necrotic and attracts other pigs. Pigs like the taste of scabs and blood and start biting. I'm certain it's initially an infectious disease. There's some oozing there and scabby material and pigs just start chewing on it."

It is clear from microscopic examination of ear tissue that the lesions begin on the surface of the skin and not from the inside. So far, the research has helped to rule out diseases like porcine circovirus and other viruses which might cause vascular damage, and similarly it does not appear to be caused by molds and mycotoxins.

As with greasy pig, researchers found *Staph hyicus* and *Staph aureus* in all pigs exhibiting clinical signs of ear necrosis. They also found that most of the isolates were resistant to beta-lactam antibiotics such as penicillin and ampicillin. They hope to examine the isolates for toxins which are capable of damaging the skin. *Treponema (spirochetes)* were in the tissues collected from a few of the pigs, but not all, which strongly suggests that these bacteria are secondary invaders and not the primary cause.

To minimize the disease, researchers recommend farmers reduce stocking density, minimize mixing and ensure adequate access to feed and water. They also note that *Staphylococci* require high humidity to thrive, so increasing air exchange and reducing humidity as well as attention to hygiene might be helpful.

The greasy pig research team includes Jeonghwa Park, Robert Friendship, Scott Weese, Cate Dewey and Zvonimir Poljak. Ear necrosis syndrome researchers are Jeonghwa Park, Robert Friendship, Zvonimir Poljak, Josepha DeLay, Durda Slavic and Cate Dewey. 📧

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