African swine fever threatens Europe

December 17 2014, by Anthony King

Credit: Thornypup

African swine fever, or ASF, is a viral disease that kills almost every pig it infects and is likened to Ebola. It gained a foothold in Georgia in 2007, when contaminated pig meat landed from a ship from South-East Africa and was fed to local pigs. From there, it spread to Russia, Belarus and spilled over the border of the European Union, showing up sporadically in Lithuania, Latvia, Estonia and Poland, this year. Now, a project funded by the EU is seeking to better understand the deadly pig virus and try to develop a vaccine for the disease. The project, called ASFORCE, brings 18 partners together to try give vets, pig farmers and policy makers scientific insights and practical tools to stop the disease spreading.

ASF is widespread in Africa. It can infect wild pigs, like warthogs, without killing them. But it causes a deadly haemorrhagic fever in domestic pigs. Unfortunately, it is rather resistant, surviving in fresh, cured and smoked pig meat and on containers, car wheels, or even on a vet's coat. The trouble is that it cannot easily be controlled. "There is no safe vaccine available for controlling the disease, and no treatment either," explains Timothee Vergne, a postdoctoral researcher in the Royal Veterinary College at the University of London, UK, who works on the project. "Because it is very contagious, what we need is early reporting, so when there is a suspicion on a farm it is important that the farmer notifies the veterinary service as soon as possible," Vergne tells youris.com. "If it is confirmed as ASF they will likely cull the infected herd and restrict the movement of humans, vehicles and animals in the surrounding areas."

One complication is that the virus can also spread to wild boar. However, the virus kills boar within a few days. This makes them less likely to play a role in keeping the virus circulating in an area. Vergne explains that evidence, so far, indicates that it is better not to hunt wild boar in an affected area, as it is likely to encourage them to disperse and potentially spread the disease further.

This type of evidence-based advice is what is needed. And it is what the project is working on. "We need to better understand the pattern of pig transport movement, to understand how the disease is transmitted between pigs and at what speed," says Vergne. "We also need to understand more about the epidemiology of the disease and to develop simulation models to try to predict what would happen if the disease was introduced into the European Union."

Countries in Europe with important pig industries like Denmark and Germany are concerned that the virus could spread across the European Union, says Hans-Hermann Thulke, epidemiologist at the Department of

Ecological Modelling of the Helmholtz Centre for Environmental Research (UFZ), Germany. He says the kind of coordinated activity undertaken by the project is therefore critical. "There are huge knowledge gaps with this disease. This is a particular strain of the virus and it is now in a completely new ecosystem here in Europe. [And] the interaction of the virus with the wild species [wild boar] is completely new for us."

What is more, he says, human behaviour is a very important component in disease spread when it goes wrong. Moving pigs, alive or dead, from an infected area can spread the disease, for example. Thulke is working on understanding the population level epidemiology of ASF. His team recently ran simulations on the role of wild boar.

Another expert who warns about the difficulty in tackling the disease is virologist Chris Oura at the University of the West Indies in St Augustine, Trinidad and Tobago, who compares the disease in pigs to Ebola. It causes rapid internal damage to the cells lining pig blood vessels and causes catastrophic internal injuries to their organs. There have been some cases found in wild boar along the Polish border, and the Baltic countries. "Germany shares a border with Poland and Poland itself has a big pig industry. And it has wild pigs on its border; they don't recognize that border and pass over," he adds.

However, key to Europe's defences is that it has monitoring in place and "excellent reference labs that can rapidly diagnose the virus if it turns up."

Developing a vaccine will be no easy task. "It is a complicated virus," explains Oura, and many researchers have tried to develop a vaccine before. He says collaboration is critical. "There is a lot of expertise in Spain and Portugal because they had to deal with this for many years," he says. "Others with a lot of knowledge are the Italians, since the virus

has been present on Sardinia for a number of years."

Sharing such expertise is crucial for an effective response, Oura concludes: "If you look at Eastern Europe and Russia today, all the countries in that region need to get together and maximize their efforts and share expertise so they can work together to control and eradicate [the virus]."

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