

Is the US ready for an African swine fever outbreak?

June 22 2023, by Tracey Peake



Credit: CC0 Public Domain

In a new study, researchers from North Carolina State University have used a computer model to understand how African swine fever (ASF) might spread among swine farms in the southeastern U.S.—and

examined the effectiveness of existing response plans. They found that although control actions would help, an outbreak could still prove persistent and costly.

The work appears in *Preventive Veterinary Medicine*. NC State Ph.D. Candidate Abagael Sykes and NC State postdoctoral researcher Jason Galvis are co-first authors.

ASF is a highly contagious viral disease in pigs, with a mortality rate that can reach 100%. Additionally, infected pigs may not show symptoms before they die, potentially allowing the virus to spread before it is detected. The cost of a potential ASF outbreak in the U.S. has been estimated at \$80 billion.

The researchers used an [epidemiological model](#), called PigSpread, to look at the different ways a potential outbreak in the southeastern U.S. could unfold. The PigSpread model evaluates six transmission routes including between-farm [swine](#) movements, vehicle movements, and local spread, to model the dissemination of ASF.

The [infection data](#) used in this model came from the Morrison Swine Health Monitoring Project. Location, production type, capacity, between-farm swine movements and vehicle movement data from 2,294 swine farms in the southeastern U.S. was collected from collaborating swine production companies and was also fed into the model.

The researchers simulated the course of infection both with and without control strategies, varying the starting point of the outbreak. Overall, they ran approximately 230,000 different simulations, with each simulation occurring over a 140-day time period. They then averaged the results.

Between-farm movements accounted for 71% of disease transmissions

in the model, with local spread and vehicular transmission both contributing about 14% each.

"The main route of transmission is of course moving animals between farms, but vehicles and local spread are also important in an outbreak scenario," says Gustavo Machado, assistant professor of population health and pathobiology at NC State and corresponding author of the work.

"Local spread refers to wildlife movements, sharing farm equipment, or visitors who may have contaminated footwear or clothing," Machado says. "But one very important variable here is vehicular transmission. This dissemination route has never been studied at a large scale, but here it has shown to be pivotal in disease spread."

The model also showed that control actions, specifically a combination of quarantine, depopulation, movement restrictions, contact tracing, and enhanced surveillance, did have an impact. In simulations where these actions were implemented, secondary infections were reduced by up to 79% on average within the 140-day time frame. Twenty-nine percent of the simulations where all control strategies were implemented saw no more affected farms within that time period.

"While these results are promising, they are still a bit optimistic," Machado says. "The model shows that policies we have in place would have a positive effect on an outbreak overall, but we need to further investigate this scenario to determine what exactly is required to get it under control. And the epidemic will likely last longer than 140 days even with these interventions."

More information: Abagael L. Sykes et al, Estimating the effectiveness of control actions on African swine fever transmission in commercial swine populations in the United States, *Preventive Veterinary*

Medicine (2023). [DOI: 10.1016/j.prevetmed.2023.105962](https://doi.org/10.1016/j.prevetmed.2023.105962)

Provided by North Carolina State University

Citation: Is the US ready for an African swine fever outbreak? (2023, June 22) retrieved 2 May 2024 from <https://phys.org/news/2023-06-ready-african-swine-fever-outbreak.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.