Researcher demonstrates how additives can help mitigate risk of African swine fever transmission through feed

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Megan Niederwerder, assistant professor of diagnostic medicine and pathobiology at Kansas State University. Credit: Kansas State University

New research at Kansas State University is demonstrating that the risk of spreading a deadly animal virus through feed can be effectively reduced

through the use of different feed additives.

African swine fever, or ASF, is a rapidly spreading and emerging transboundary animal disease that threatens pork production and human food security worldwide. Although African swine fever virus does not affect humans, it has reduced pork availability in some countries with afflicted pigs.

The K-State research team, headed by Megan Niederwerder, assistant professor of diagnostic medicine and pathobiology in the College of Veterinary Medicine, has just published a new study, "Mitigating the risk of African swine fever virus in feed with antiviral chemical additives," in the scientific journal Transboundary and Emerging Diseases. This study provides the first evidence that feed additives may be effective tools against African swine fever.

"Over the last two years, ASF is estimated to be responsible for the death of at least 25% of the world's pig population due to the emergence of the virus within China and subsequent spread to over 10 other Asian countries," Niederwerder said. "In 2019, we published the first report of African swine fever virus, or ASFV, transmission through the natural consumption of plant-based feed. Our subsequent work has focused on mitigation of ASFV in feed through the use of chemical feed additives and heat treatment."

Although feed additives have historically been used to reduce the risk of bacterial contamination in feed, research thus far has not reported efficacy for the inactivation of African swine fever virus in feed ingredients. Niederwerder said there are currently no commercially available vaccines and no effective treatments that can be administered to pigs for ameliorating disease caused by the virus. Thus, control of African swine fever is focused on biosecurity measures to prevent the introduction of the virus into negative countries or negative farms and

regions within a positive country. The other method of containment would involve large-scale culling of infected or high-risk animals to contain the spread of the virus.

"Our new research reports novel data evaluating the efficacy of feed additives on inactivating ASFV in an in vitro cell culture model and a feed ingredient transoceanic shipment model," Niederwerder said. "This will provide valuable information to the swine industry with regards to mitigating the risk of potential routes for introduction and transmission of ASFV through feed and ingredients."

Niederwerder and her team examined two different classes of liquid feed additives, including a medium-chain fatty acid-based additive and a formaldehyde-based additive, for efficacy against African swine fever virus in cell culture and in feed ingredients. In general, both chemical additives demonstrated evidence of reducing the virus infectivity, with data supporting dose-dependent efficacy.

This study was funded by a grant from the Swine Health Information Center and the State of Kansas National Bio and Agro-defense Facility Fund.

While the results of the study are promising, Niederwerder emphasized the need for a multifaceted approach to reducing the risk of African swine fever virus in feed, including sourcing ingredients from countries without the virus when possible, applying holding times to high-risk ingredients, and implementing consistent biosecurity protocols at the feed mill.

More information: Megan C. Niederwerder et al. Mitigating the risk of African swine fever virus in feed with antiviral chemical additives, *Transboundary and Emerging Diseases* (2020). DOI: 10.1111/tbed.13699

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