



## CBTS-African Swine Fever Projects



Source: TAMU Agrilife

African Swine Fever Virus (ASFv) is a highly contagious animal disease that has the potential to devastate pork industries. If ASFv were to reach the United States, it could cause significant harm to the pork and agricultural sectors, trade, and the economy with impacts that could reach into the billions. If an ASFv outbreak were

confirmed in the United States, response strategies for controlling and stopping the spread of the outbreak would likely be far-reaching. In response to ongoing efforts and stakeholders in the Department of Homeland Security, CBTS identified and funded four projects designed to fill research gaps in our understanding of ASFv with respect to economic impacts, prevention, mitigation and response strategies.

The first project entitled "User-friendly online dashboard for the assessment of the risk of African swine fever virus introduction, exposure and potential spread into the United States," is a cooperative effort among three universities, U.C. Davis, Iowa State, and Kansas State. This project will estimate the risk of ASFv introduction and spread in the US through multiple pathways and generate a web-based tool that will facilitate timely updates of risk estimates by animal health officials and other stakeholders using open-source data and will provide risk estimates for the nation and at fine spatial/temporal scale by state. This project seeks to evaluate the risk of an ASFv introduction into the United States through multiple pathways such as imported feed components, contaminated fomites, unintentional introduction in passenger cargo, international garbage and its inappropriate use for swill feeding, and importation of

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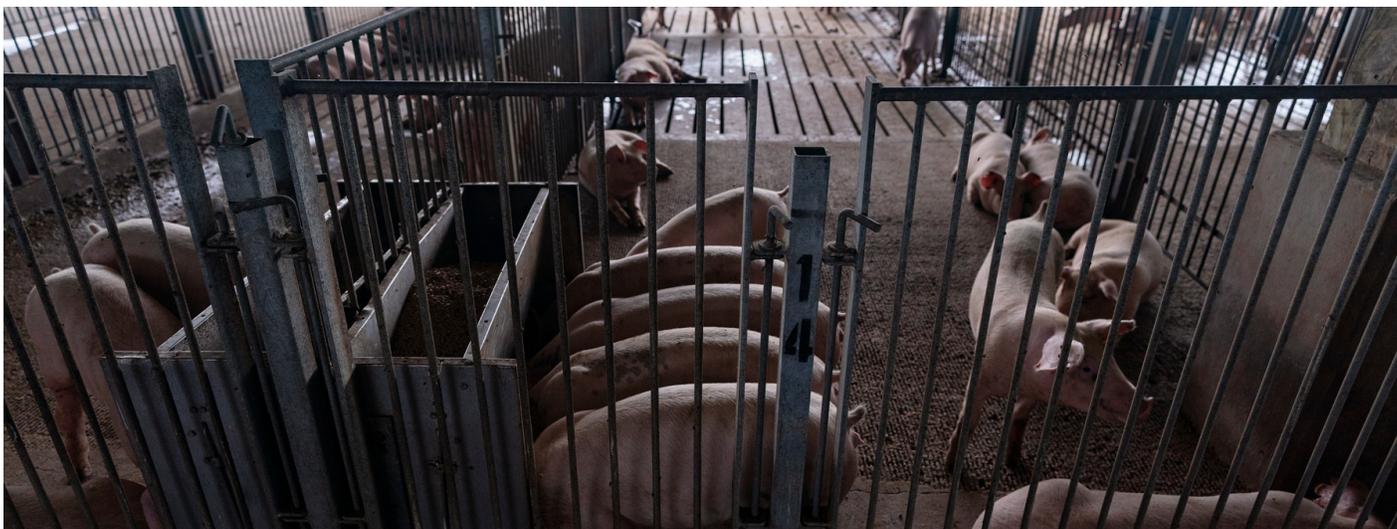
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contaminated pork and pork products. It will also develop a spatial-explicit disease spread model to evaluate the potential progression of ASFv once introduced.

A second project entitled “Direct threat assessment of African Swine Fever virus-competent tick vectors, *Ornithodoros* spp., at the U.S.-Mexico border and near swine operations in Texas,” is a joint effort between TAMU AgriLife and the TAMU Veterinary School. As the title indicates this project focuses on ASFv risks associated with *Ornithodoros* spp. ticks across various locations throughout Texas and the risks associated with disease movements and potential reservoirs in wildlife through contact with *Ornithodoros* spp. tick vectors. During this project the team seeks to identify locations that can be cost effectively surveilled by animal health and wildlife officials, as part of the development of surveillance systems to detect the establishment of reservoirs of ASFv via the sylvatic tick cycle along the U.S.-Mexico border.

A third project entitled “Measuring the Economic Impacts of African Swine Fever Virus on United States Supply Chains,” is a collaborative effort among TAMU’s Institute for Infectious Animal Diseases, the University of Liverpool, and Kansas State University. The primary objectives of this project are to measure the economic impacts of ASFv on domestic supply chains in the food and agriculture sector. The team will develop models to measure economic impacts on the pork production supply chain. This analysis will also estimate the economic welfare impacts caused by an ASFv outbreak and estimate the direct, indirect, and induced effects of the U.S. swine industry, allied industries, and non-agricultural industries.



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The fourth project in this research effort entitled “A Validated Method for Environmental Surface Sampling for Detection of African Swine Fever Virus,” is based at Kansas State University. The team seeks to test sampling methods for ASFv on various surfaces, including representative of surfaces on which ASFv could potentially enter the United States and threaten U.S. agricultural systems. To do this the team will determine the optimal environmental sample collection device for detection of ASFv by qPCR, and the most effective pre-extraction incubation conditions of environmental samples prior to analysis by qPCR. The team also seeks to identify the most effective methods to further process environmental samples to recover detectable ASFv DNA from different contaminated organic materials, and to determine the most effective extraction methods for detection of ASFv DNA within environmental samples. Determine detection limits of environmental swabs on a wide variety of surfaces using two levels of organic material contamination using the technique determined to have the greatest diagnostic sensitivity for both qPCR analysis and virus titration.

Over the next twenty-four months, CBTS will partner with each of the research teams and meet monthly with the researchers to share information and receive updates on recent progress. As the research projects progress, the teams will also share their discoveries through peer-reviewed publications and other products designed to communicate interesting findings that will aid our understanding of potential impacts and support efforts to mitigate the spread of the disease in the event the disease reaches our pork industry.

## Note on Agricultural Disruptions Caused by the War in Ukraine

Often the quickest way to realize the interconnectedness of our food systems is to watch how markets react when events in a region disrupt the movement of commodities. When Vladimir Putin ordered Russian forces to invade Ukraine, we saw how quickly markets a world away could be disrupted, and once disrupted, how difficult and halting the subsequent recovery processes can be.

USDA data show that Ukraine and Russia are important exporters of food commodities, fertilizers and agricultural raw materials. Prior to the Russian incursion, Ukraine was the fourth largest exporter of corn, eighth largest exporter of wheat, and number one exporter of sunflower seeds, oil, and meal. It also played a significant

role in the exports of barley and rapeseed. Though Ukraine accounted for ten percent of global exports prior to the 2022, this year their export volumes are down ninety percent.

Movements of Russian grains have been much less affected as no one has bombed or mined their ports, and no one has imposed sanctions on their grain trade. According to USDA data Russian wheat exports in the market year 2020/21 represented almost twenty percent of global exports, and Ukraine accounted for just over eight percent. For coarse grains which include corn, barley and number of other feed grains, Russia accounted for about four and a half percent of global exports while Ukraine accounted for twelve percent. According to GCaptain.com (a global shipping website) Russia's reported wheat and coarse grain export sales this year remain stable while Ukraine's shares sharply declined. Russia has continued to safely ship grains using a mix of traditional Russian traders and western shippers like Cargill, Viterra, and Louis Dreyfus. This has allowed Russia to benefit from higher grain prices and partially recoup income losses caused by other western sanctions.

Unfortunately, Russian assets are also accused of stealing Ukrainian grain and disguising ship movements to and from Russian controlled Ukrainian grain ports. An Israeli maritime artificial intelligence firm, Windward, has documented over 170 incidents where Russian and Syrian vessels turn off their automatic identification systems in a bid to hide their positions and movements. North Korean and Iranian shippers have used the same deception tactics to skirt oil and other sanctions. Maritime observers have also documented the open sea transshipments of grains on to



Source: TAMU Agrilife

ships that found their way to Syria. These thefts, which may exceed \$100 million, have become so common that observers have coined the phrase “grain laundering” to describe this illegal movement of Ukrainian grains.

The connectedness of world markets means that higher food commodity prices have affected U.S. producers and consumers. Adding to the supply chain issues we have faced in the past two years; the invasion has played a role in rising consumer prices and increased input prices for farmers and ranchers. Increased input costs could extend inflation into subsequent years. Ukraine and Russia also represent a significant share of the inputs used to manufacture fertilizers and other crop enhancing nutrients. Between the two nations, they account for about a quarter of the world’s fertilizers. While input use can be adjusted or replaced by products from other nations, the rising cost of key inputs affects producers’ plans and the profitability of their operations. Those changes layered on top of the all the other production and marketing risks producers typically face could have a significant impact of production decisions next year.

Russia’s invasion of Ukraine has damaged agricultural areas and the industries that support the production and marketing of agricultural products. Even if the war were to end today, the lasting impacts of damage inflicted on Ukraine’s productive resources means that we can expect reduced production of important commodities into the future. The prospects for future Ukrainian exports depend on future production, but also on the country’s ability to reopen maritime ports and repair critical infrastructure. Recently, Ukraine, the UN, and Russia negotiated a process for legally shipping Ukraine’s grain to world markets. Of course, in the days that followed, Russian missiles struck Odessa, one of three Ukrainian ports included in the 120-day UN deal, and the founder of Ukraine’s largest private grain company and exporter died when a Russian guided missile flew through his bedroom window and exploded.

Despite the Russian actions, a corridor has opened, and ships have begun moving Ukrainian grain to world markets. However, recovery is slow and fraught with uncertainty. As ships previously trapped in Ukrainian ports are loaded and begin reentering global commerce, shippers face crew and fuel shortages, the rising insurance premiums, questions about grain quality, longer voyages caused by the additional inspections required by the UN agreement, and escort costs. Those issues and a fading confidence in Russia’s ability to honor international agreements makes prospective buyers hesitant to purchase Ukrainian grain. The UN estimated that disruptions in Ukraine’s grain and oilseed trade initially caused thirty percent increases in their Global Food Price Index. While prices have eased in the past few months, the prospect of increased hunger or even famine remains serious. The World Food Program estimates that the



Source: TAMU Agrilife

Russian invasion may force additional fifty million people into “acute hunger.” Import dependent nations with limited capacities to absorb higher prices have struggled, especially when their shares of disposable income spent on food exceed twenty or thirty percent. These increases force consumers to shift consumption to other commodities, but the ability to substitute is imperfect at best. Along with production concerns in other regions, the invasion related disruptions have led the U.S. to increase its international food assistance efforts.

Sadly, the constraints imposed on Ukraine mean that grain movements, though greatly needed, are not sufficient to provide long term relief for people in famine-stricken nations. For example, a recently released 33,000 ton-shipment of Ukrainian grain destined for Ethiopia by way of Djibouti will feed about 1.5 million people for about a month. That is great news, but it is sobering to think that United Nations’ World Food Program estimates that weather, surging food prices and conflict mean eighty-two million people need food aid across African nine countries. Increased charter demand for



Source: © [Kamchai] /Adobe Stock

“handysize” bulk cargo vessels is one indication of commercial efforts to mitigate this tragedy. These vessels that are smaller and have shallower drafts that allow them to access to African nations that cannot accommodate larger vessels. The potential downside of their use is that it will take more trips to move the grain trapped in Ukraine. Given that the clock is running on the 120-day UN agreement, shippers may only be able to move half of the stranded grain before the agreement ends (as of mid-September - about halfway through the agreement - Ukraine had shipped about 15% of its estimated exportable grains).

Even as Ukrainian grains and oilseeds begin to reach global customers, the ability of Ukrainian farmers to harvest this year’s crops and plant and harvest next year’s crops remains a question because of damage to inland transportation, production, and merchandising systems and assaults by Russian units that intentionally target farms and crops. Adjustments to planting and harvesting season activities can be made, but a sizable portion of Ukraine’s agricultural production is in the eastern regions of the country where much of the fighting has taken place. Given that Russia has demonstrated an interest in crippling the Ukrainian economy, agriculture remains an inviting target as it typically accounts for 10% of Ukraine’s GDP.

Given no one knows when Russia will call off its invasion, we can expect more opportunities to view how events a world away can affect domestic consumers and producers. We will also have the opportunity to see how these events affect those around the world who face famine conditions and have the least ability to adjust.

## Upcoming Events:

- CBTS Distinguished Speaker Series: Daniel Gerstein
  - October 5, 2022 @ 10 am – 11 am
- CBTS Distinguished Speaker Series: Michael Pravica
  - October 27, 2022 @ 12 pm CST

**Get more information on our website:**

<https://cbts.tamu.edu/events/>