



## Small-Scale and Niche Market Pork Production Bulletin No. 17 Tidewater Agricultural Research and Extension Center, Suffolk, VA

### An Update on African Swine Fever and its Effects on Pork Production

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#### INTRODUCTION

Since August 3, 2018, 154 outbreaks of African Swine Fever (ASF) have occurred in China, with 32 provinces, regions, and municipalities in the country affected. In an effort to control the disease, officials have euthanized more than 1.17 million pigs. The first case reported in 2018 occurred on a small farm in Shenyang, in the northeastern province of Liaoning, near the border with North Korea. Subsequent cases soon occurred at locations far away, such as Wenzhou in the Zhejiang province, which is 1,336 miles from Shenyang. Last year, the Food and Agriculture Organization of the United Nations (FAO) feared that the disease would continue to spread in China and likely infect other countries in Asia. Unfortunately, this came to pass, as ASF has emerged in seven more Asian countries this year including: Mongolia (January 1), Vietnam (February 19), Cambodia (April 2), North Korea (May 23), Laos (June 20), and Myanmar (August 1). Over 5 million pigs in Asia have died from the disease or been culled to prevent its spread. In Vietnam alone, over 4 million pigs have been euthanized. Authorities in the Philippines have reported a suspiciously large increase in pig deaths on small farms, and samples are currently being tested for ASF.

African swine fever is a highly contagious viral disease that can cause death losses of 100% in young and old swine alike. Introduction of the disease into a country negatively affects food security and the economy. Although the U.S. has never had a case of ASF, the swine industry must remain vigilant. The objective of this paper is to provide the reader with a brief summary of ASF and its effects on pork production.

#### WHAT CAUSES AFRICAN SWINE FEVER?

A large, double-stranded DNA virus causes ASF. Scientists have identified twenty-two strains of the ASF virus that differ in virulence (in other words, its severity or harmfulness). The virus does not affect humans.

*Sylvatic cycle* refers to the fraction of a pathogen's lifespan spent cycling between *wild animals* and *vectors*. In Africa, the ASF virus purportedly cycles between warthogs (the wild animal) and soft ticks

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(the vector). Young warthogs, bitten by infected ticks while still in the burrow, develop viremia (in other words, virus in the blood) and subsequently infect other ticks feeding. Warthogs are resistant to and not affected by the ASF virus. Infected ticks fall off warthogs and then attach to a new host, such as domestic pigs. Once infected, a domestic pig transmits disease to other domestic pigs by direct contact. In Europe, feral swine and wild animals such as the European Wild Boar are also very susceptible to ASF.

The ASF virus is very hardy and can persist for months in uncooked pork products, animal feedstuffs and “swill” (food scraps fed to pigs). Thus, indirect transmission is important in the spread of the disease.

### **WHAT ARE THE CLINICAL SIGNS OF AFRICAN SWINE FEVER?**

In domestic pigs, however, the virus causes a loss of appetite and weakness, elevated body temperatures of 104 to 108°F (normal body temperature for a pig is 102.5°F), red, blotchy skin or skin lesions, diarrhea, and vomiting. Pigs may exhibit coughing or difficulty breathing. Pregnant females often abort their litters. Morbidity rates (in other words, the incidence of a disease across a population) range from 40 to 85%. In young pigs, death loss is usually 100%. In adult animals, highly virulent strains are associated with mortality rates of 90 to 100% and low virulent strains cause death losses of 10 to 30%.

### **WHERE DOES AFRICAN SWINE FEVER OCCUR?**

Over 50 countries in the world have had ASF at one time or another, and more than 40 countries have reported a case within the past five years. The U.S. has never had a case of ASF. R.E. Montgomery first described ASF in 1921 when the causative virus spread from warthogs to domestic swine in Kenya. Warthogs are very resistant to the disease and show no clinical signs. The disease exists in most East (examples Kenya, Uganda), Southern (examples South Africa, Namibia) and West African (examples Ghana, Ivory Coast) countries south of the Sahara desert, including the island countries of Madagascar and Mauritius, and scientists have implicated other wild swine, such as *Bush pigs* in its transmission as well.

The first country outside of Africa to report ASF was Portugal in 1957 and the disease was *endemic* (in other words, regularly found) in the Iberian Peninsula (Spain and Portugal) until the mid-1990's. Outbreaks of ASF have since occurred in many European countries including Spain (1960), Malta (1978), Italy (1967 and 1980), France (1964, 1967 and 1977), Sardinia (1982), Belgium (1985) and The Netherlands (1986). African swine fever introduced in 2007 to Georgia (country) quickly spread to Armenia, Azerbaijan and several Russian territories. European countries that currently have ASF include Bulgaria, Hungary, Latvia, Moldova, Poland, Romania, Russia, Serbia, Slovakia, and Ukraine.

In 1971, Cuba became the first country in the western hemisphere to report ASF, probably introduced from Spain. During the 1970's and 1980's, several Caribbean island countries reported ASF, including Cuba (1978 and 1980), Dominican Republic (1978 and 1981), and Haiti (1979 and 1984). African swine fever occurred in Brazil in 1978 and 1981.

## ARE THERE VACCINATIONS FOR, OR TREATMENTS AGAINST, AFRICAN SWINE FEVER?

Currently there are no commercially available vaccines to protect against ASF. As mentioned previously, the ASF virus is genetically diverse with many strains. Thus, one concern with vaccine development is that a product effective against one strain may offer little protection against another. Once a pig has contracted ASF, prospects for survival depend on the infective strain but death losses of 100% are common. Thus, there are no effective treatments for stricken animals.

The disease spreads by legal or illegal movement of infected animals or pork products, or by transportation of infected feedstuffs. As with any foreign animal disease (FAD), the best approach is to prevent the pathogen from entering the country. Biosecurity is essential. Although research has suggested a low annual probability of ASF introduction to the U.S., the pork industry must remain vigilant. The risk of exposure of domestic pigs to imported live pigs infected with ASF is very low (roughly one outbreak of ASF in 276 years). If such an event did occur, however, it is most likely that entry would be through Iowa, Minnesota or Wisconsin, with pigs originating in Canada. The risk of ASF introduced by contaminated pork products is greater than the risk associated with live animals. Research suggests that the risk of entry is greatest in the coastal states of New Jersey, Virginia, and California, where large seaports exist, with pork products released from Denmark and Poland. The risk of feral pigs accessing contaminated swine products in landfills is greater than the potential exposure of domestic pigs through swill. The National Pork Board, National Pork Producers Council, the American Association of Swine Veterinarians, the Swine Health Information Center and the USDA have focused collaborative efforts on the safe importation of feed ingredients. This is logical given Porcine Epidemic Diarrhea virus (**PEDv**), which emerged in the U.S. for the first time in 2013, killing millions of pigs, probably entered the country through contaminated feedstuffs.

## EFFECTS OF AFRICAN SWINE FEVER ON FOOD SECURITY AND ECONOMICS

African swine fever has food security implications, especially in countries where pork is a major source of dietary protein for humans. For example, in the African countries of Cote d'Ivoire and Madagascar, African swine fever introduced in the late 1990's, resulted in a decrease in the entire pig population of 30 to 50%.

Newly introduced or endemic ASF severely affects the economies of countries with large commercial swine industries. However, the greatest losses typically occur on small-scale pig farms lacking effective biosecurity and control strategies. An ASF infection results in a loss of export markets and extremely costly procedures for eradicating the disease. Introduction of the disease to Cuba in 1980 resulted in control and eradication costs that exceeded \$9.4 million (USD). During the 1990's, Spain spent over \$92 million for the last five years of the ASF eradication program. **It has been estimated that the net benefit of preventing introduction of ASF into the U.S. is nearly \$4.5 billion.**

China produces more hogs and consumes more pork than any other country in the world. Indeed, nearly 50% of the world's pig population is in China. In July, 2019, the number of live pigs in China was down 32.2%, and the number of breeding sows was down 31.9%, compared to July, 2018. The current outbreak of ASF will continue to have devastating effects on the Chinese economy. The disease is causing extreme pork shortages. Supplies were already tight, a result of the 25% tariff that the Chinese placed on pork imported from the U.S. Consumer pork prices in China have risen over 7%.

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