AFRICAN SWINE FEVER IN THE CAUCASUS, RUSSIAN FEDERATION AND EASTERN EUROPE

African swine fever (ASF) is a highly contagious, OIE-listed, viral disease of pigs, which has serious health, economic, and international trade consequences. While some viral strains cause serious viral hemorrhagic disease with near-100 percent mortality, others result in more subtle clinical signs and can be difficult to identify.

African swine fever is endemic in Africa, but viruses have occasionally caused outbreaks in other parts of the world. The European continent, except for the Mediterranean island of Sardinia, was free of ASF virus from the mid-1990s until 2007, when a new virus was introduced to the Caucasus, a region bordering Europe and Asia. Since that time, ASF virus has spread northward and westward. In an era where the global movements of people, products, and animals are common, the swine industry is on alert. The introduction and spread of ASF illustrate the consequences and challenges of a virus that persists for long periods in animal products and infects free-ranging wild boar, which do not respect borders.

HOW IT BEGAN AND SPREAD

On May 17, 2007, the Republic of Georgia notified the OIE of several disease outbreaks in domestic swine suspected to be postweaning multisystemic wasting syndrome (porcine circovirus type 2). However, on June 4 an OIE Reference Laboratory in the United Kingdom confirmed that ASF virus was present in the submitted samples. This virus isolate also underwent DNA sequencing to determine its genotype. Researchers concluded that a single introduction of the virus had likely occurred, and its source was probably eastern or southern Africa.

The first cases of ASF appeared on the west coast, suggesting a connection to the port city of Poti, located on the Black Sea. Though details are lacking, it has been

AFRICAN SWINE FEVER is caused by a large, enveloped, double-stranded DNA virus of the Asfarviridae family, and is primarily endemic in sub-Saharan Africa. ASF virus infects domestic pigs, feral swine, and some wild members of the pig family (Suidae). Wild suids, such as warthogs, play an important role in maintaining this virus in Africa. It is not known to infect other livestock or humans.

In domestic pigs, the clinical presentation ranges from peracute to chronic, and the clinical signs are variable. These signs can include sudden death, fever, diarrhea, hemorrhagic signs, respiratory signs, and abortions. The syndromes caused by ASF virus can be clinically indistinguishable from a number of other pig diseases, including classical swine fever, salmonellosis, erysipelas, and porcine multisystemic wasting syndrome. There also seem to be some ASF isolates that cause little or no illness in pigs.

ASF virus can be transmitted directly between animals, indirectly via fomites, or by tick vectors. Infected animals shed ASF virus in all secretions and excretions. While this virus is relatively stable in the environment (facilitating transmission on fomites), it is especially persistent in some pork products, where it can remain viable for weeks to months. Soft ticks of the genus Ornithodoros play an important role in transmitting ASF virus in parts of Africa, especially in a transmission cycle that maintains this virus between ticks and young warthogs. The importance of ticks in virus maintenance during the current European outbreak is not yet known.
suggested that the ASF virus was introduced to Georgia via virus contaminated garbage (swill) from international ships. This swill may have been fed to pigs living near the port, or ingested by free-roaming pigs.

During 2007, Georgia reported 49 separate outbreaks with more than 64,000 cases. The case fatality rate was nearly 100 percent. Georgian authorities stamped out these outbreaks with a combination of movement controls, disinfection, quarantines, and zoning, and declared the event resolved in January 2008.

However, the virus had already spread to other countries in the Caucasus, and to Russia. This most likely occurred through the movements of infected wild boars. Russia was not able to eradicate this virus and it is now considered endemic in its southern region. The virus continued to spread and caused outbreaks in the Ukraine in 2012, Belarus in 2013, and the Baltic States and Poland in 2014. As of December 2015, reports of outbreaks continue, mainly in wild boar.

RISKS FOR TRANSBOUNDARY SPREAD
There are a number of factors that affect the likelihood of transboundary spread of ASF virus. The major risks for transmission of the virus include:

- Feeding of food waste collected from international airplanes or ships from countries where the disease is found;
- Feral swine movements;
- The movement of trucks between infected and disease-free areas;
- Illegal movement of infected pigs or pork products, which may be unintentional (e.g., by tourists) or intentional (e.g., meat smuggling).

SWINE INDUSTRY IMPACT
Overall, the ASF epidemic has led to a huge reduction in the swine population in the Caucasus, both through infection and depopulation. From 2006–2010, the number of swine decreased 70% in Georgia and 56% in Armenia. Pigs nearly disappeared from Azerbaijan, which only had 22,000 swine before the epidemic. The swine population in Russia did not decrease initially, but it has been shrinking since 2010 in areas affected by ASF. Though information from most other countries is generally lacking, it is estimated that Russia alone experienced direct and indirect losses of $1 billion (in U.S. dollars) between 2007 and 2012.

PREVENTION AND CONTROL
Changes in production practices, increasing globalization, and outbreaks of ASF in Europe have increased the risk that this disease may be introduced into North America. No vaccine is available, and if ASF were to enter the U.S., control measures must prevent the spread of this virus and eliminate it as quickly as possible. The primary control and eradication strategy in the U.S. will be depopulation of infected and exposed susceptible animals.