

## **Wildlife Case Scenario**

Mr. Ted Fowler has a 2200-acre crop farm that is planted in corn, soybeans, peanuts, and cotton on a rotational basis. Harvest of soybeans and peanuts is expected to begin in the next couple of weeks in early October. Mr. Fowler discovers that several fields of soybeans and peanuts have been damaged. Peanuts have been uprooted and soybeans trampled, and the legumes from both plants eaten. He suspects the damage is from feral swine. Although he has never had a problem with feral swine in the past, he has heard from neighboring farmers that feral swine are invading the area and causing issues. Over the next few evenings, Mr. Fowler and his son patrol the farm and detect at least two sounders of approximately 15 feral pigs each.

**What are Mr. Fowler's options to solve his suspected feral swine problem?**

Mr. Fowler decides against hunting the feral swine based on conversations with his extension agent. Hunting may cause behavioral changes and dispersal and is not effective at removing all members of a sounder in a timely manner. Mr. Fowler suspects that his neighbors have been shooting pigs, which has driven the sounders onto his property. The extension agent recommends that he contact USDA-APHIS Wildlife Services for trapping assistance.

Mr. Samuels at APHIS Wildlife Services fields Mr. Fowler's phone call requesting assistance. Mr. Fowler learns that there are no approved baits to poison feral swine and while contraceptive techniques are being researched, they are ineffective in open populations, very expensive, and a long-term management strategy that would be ineffective with the immediate problem of feral swine destroying his crops. Mr. Samuels recommends corral trapping and arranges a time to visit Mr. Fowler's farm.

Upon inspecting Mr. Fowler's property, Mr. Samuels observes the increasing crop damage and evaluates signs of feral swine movement. He recommends the construction of two corral traps with guillotine doors situated close to creeks running through the property. There are numerous wallows beginning to cause serious erosion of the creek banks and damage to trees from swine rubbing off the bark. A recent Environmental Impact Statement issued by APHIS to evaluate management strategies for reducing damage and risks to agriculture, natural and cultural resources, property, and human health and safety from feral swine led to a nationally coordinated, integrated Feral Swine Damage Management Program. This is good news for Mr. Fowler because he currently does not have to pay for assistance from APHIS Wildlife Services.

Over the course of a week, 48 pigs are trapped.

**Discuss the sequence of events that leads to a solution for Mr. Fowler. What expertise does Mr. Samuels contribute towards solving this problem?**

**Feral swine are not just an issue for agriculture. Discuss your perceptions of natural and cultural resources, property, and human health and safety concerns that contributed to the integrated Feral Swine Damage Management Program. How does illustrate a One Health approach to problem solving?**

**What happens to the feral pigs once they are trapped?**

Mr. Fowler checks the corral traps first thing every morning. Feral swine are most active at night. Checking traps at dawn minimizes the time pigs are held in the corrals. Mr. Fowler immediately calls Mr. Samuels if any pigs are trapped so the animals can be expediently and humanely euthanized. Pigs are shot with a 22 long rifle fired into the brain cavity (~2 inches above the eyes) resulting in a quick, humane death. Importantly, captive bolt and gunshots to the cranial cavity are approved euthanasia measures by Institutional Animal Care and Use Committees (IACUC) nationwide. Blood samples are immediately collected after euthanasia from 26 pigs. Serum from these samples will be screened for pseudorabies, classical swine fever, swine influenza, brucellosis, and porcine reproductive and respiratory syndrome. Carcasses are transported to a landfill approved for animal disposal.

**Even though feral hogs are an invasive, nuisance species, welfare of any animal is an important concern. The relationship between animals and people is integral to One Health solutions. Discuss this relationship in the context of this particular case scenario. Would this have been something you would have considered if not explicitly stated? Would your attitude toward the feral swine been different if a pig had killed your pet dog?**

**Why is USDA-APHIS interested in screening for these diseases in feral swine? Are any zoonotic (transmissible to people)?**

**Discuss possible alternatives for disposing of the feral hogs. Include environmental considerations.**

Five pigs are seropositive for *Brucella suis* and two additional pigs are positive for pseudorabies. Both pseudorabies and *B. suis* have been eliminated from commercial swine operations in the United States. Their presence in feral swine poses a risk of spillover if biosecurity measures fail.

Pseudorabies is caused by an alpha-herpesvirus, and pigs are the host reservoir. Clinical signs depend on the age when naïve pigs are exposed and can range from inapparent to neurological, respiratory, or reproductive. Pseudorabies is not considered a zoonotic disease, but the herpesvirus that causes pseudorabies can infect a wide variety of wildlife and domestic animals, including dogs and cats. Infections of aberrant hosts are invariably fatal.

Brucellosis is a zoonotic, bacterial disease, and *B. suis* is one of several *Brucella* species that can cause serious illness in people. *Brucella suis* infection of hunters is linked to butchering feral swine. Infected swine may experience reproductive issues, including abortions and male sterility. Sows usually lose the litter they are carrying when infected and then carry subsequent litters to term. During parturition, bacteria are shed contaminating the environment and exposing susceptible pigs. *Brucella suis* causes persistent infections in swine and can lead to joint problems and debilitating lameness.

A *Pestivirus* in the family Flaviviridae causes classical swine fever, also known as hog cholera. This highly contagious virus was eradicated from the United States in 1978 after a 16-year concerted effort and is now considered a foreign animal disease. The virus remains present in areas of Mexico, Central and South America, and the Caribbean so there is concern about re-introduction. Feral swine serve as potential sentinels if the virus ever enters the country.

Screening for swine influenza provides information about which viral sub-types are in circulation and whether recombinant events are occurring between domestic poultry and/or wild birds and feral swine. Such recombination events can signal the emergence of an influenza strain that potentially may infect humans and possibly be transmitted between people. Surveillance is important for understanding the epidemiology of seasonal influenza viruses.

Porcine reproductive and respiratory syndrome (PRRS), unlike pseudorabies, brucellosis, and classical swine fever, is widespread in domestic swine in the United States and can have devastating impacts on swine facilities. The name of the syndrome describes the two systems affected by this *Arterivirus* infection. Considerable heterogeneity exists among viral isolates because of inherent errors in RNA transcription. Cross-protection between viral isolates does not usually occur. The role, if any, feral swine play in maintenance of PRRS in the environment is not known. Screening feral swine for PRRS exposure is the first step to addressing this issue.

**Based on the information provided, categorize each disease to its potential impact on commercial swine, people, and other animals.**

**What happens to the serology results? Where does this information go?**

**How does this information reach people outside of regulatory agencies?**