What is pseudorabies?
Pseudorabies (abbreviated PrV) is also called Aujesky’s disease and is named for the man who first described the disease in dogs, cats, and cattle in 1903. Pseudorabies primarily affects swine; however, cattle, sheep and other mammals are susceptible to infection. Humans are not at risk of contracting pseudorabies. The superficial symptoms of this viral disease, such as disorientation, foaming at the mouth, and convulsions or tremors, resemble rabies symptoms, thus the name pseudorabies. However, pseudorabies is caused by a different virus, one that is related to the human herpes virus. The disease is sometimes called “Mad Itch” because infected cattle and sheep will rub against objects to relieve the itching sensation on the skin. In addition to neurological signs, animals may show respiratory distress or infection of the reproductive system. The disease is often fatal in piglets, but weaned pigs, juveniles, and adults typically recover and survive after 7 to 10 days of illness (Murphy et al. 1999). Once infected, pigs become carriers of the virus throughout their lives and continue to shed the virus when stressed (USDA 2008).

Pseudorabies in Feral and Domestic Swine

Once a commercial vaccine was developed, a nationwide control effort eliminated pseudorabies from the US commercial swine industry in 2004. It remains a common disease in commercial piggeries globally, however. Before the elimination of pseudorabies from commercial operations, the US economy lost $34 billion annually to control efforts and lost revenue (Ministry of Supply and Services Canada 1988). Current vaccines for domestic swine are considered both safe and effective.

Although the disease was eliminated in commercial animals, feral swine populations in the United States continue to circulate pseudorabies and provide a reservoir for outbreaks. Texas, Oklahoma, Florida, and Hawaii all have dense populations of feral swine with a high seroprevalence of pseudorabies (Figure 1), posing a serious risk of potential disease spill-over into commercial swine operations, livestock, companion/working animals and wildlife.


Who is at risk for contracting pseudorabies?
Along with swine, cattle and sheep are susceptible to pseudorabies (Figure 2), and the disease is fatal to these animals. Once a cow or sheep is infected, it takes 2 to 5 days for symptoms to develop, and once more severe neurological, respiratory, and reproductive symptoms occur, infected livestock die within 1 to 2 days (Callan and Van Metre 2004). Sporadic outbreaks of pseudorabies occur in cattle, particularly when they are co-mingled with swine (Beasley et al. 1980). The virus may be passed directly via nose-to-nose and venereal contact and indirectly via contact with urine or feces. The virus can live for up to two weeks in the environment.

Pseudorabies is a fatal disease in dogs and cats. Symptoms are similar to rabies including excessive salivation, scratching that can lead to self-mutilation, and a lack of coordination or paralysis, but animals infected with pseudorabies will not display an aggressive behavior as do rabid animals (Thiry et al. 2013). There is no vaccine to prevent pseudorabies in cats or dogs.

In the United States, cats and dogs become exposed to the virus when fed raw meat or offal from infected feral swine. Dogs used to hunt feral swine have additional risks because they may also become infected if they come into contact with live feral swine, or feral swine carcasses, gut piles, or feces.

Wild carnivores are susceptible to pseudorabies, and deaths from the disease have been documented in European brown bears (Zanin et al. 1997), wolves (Verpoest et al. 2014), raccoons (reviewed in Thawley and Wright 1982), Florida panthers (Maehr et al. 1991, Glass et al. 1994), and coyotes (Raymond et al. 1997). Carnivores are considered a dead-end host to pseudorabies, i.e. the disease does not persist and circulate in populations of carnivores because animals succumb to the disease so rapidly that they rarely transmit the disease. Most documented deaths in wildlife come from captive studies where animals have been fed infected pork. More work is needed to understand the risk of pseudorabies to carnivore populations in the wild. Carnivores may become exposed to pseudorabies when they prey on feral swine (adults or piglets) or eat the carcasses or gut piles of infected feral swine that are disposed by managers at public and private hunting areas or by animal control personnel. Considering the presence of pseudorabies virus in the blood of feral swine and the environmental resistance of the virus, the consumption of swine carcasses and offal may facilitate additional opportunities of pathogen transmission to scavenging wildlife and carnivores (Hernández 2017).

How can I protect my pets from pseudorabies?
There is currently no vaccine available for cats or dogs; attenuated vaccines (i.e., live virus vaccines) that protect pigs are lethal for cats (Thiry et al. 2013) and dogs. If house cats and dogs are fed meat from feral swine, it should be thoroughly cooked. Commercial pet food is the safest product to feed pets.

Hunting feral swine with dogs has been a sport for centuries (Figure 3) and is still popular today throughout the United States. Dogs used for hunting feral swine are particularly at risk for contracting and dying from pseudorabies. To reduce the risk of exposure, dog owners should limit contact between dogs and swine and prevent dogs from eating any part of feral swine, unless the meat is thoroughly cooked.
**Pseudorabies in Florida**

In the United States, approximately 18% of feral swine are seropositive for pseudorabies, meaning that they have been exposed to and are likely carriers of the virus (Pedersen et al. 2013). Florida, however, has a higher-than-average feral swine population of between 500,000 and one million individuals (Giuliano 2010), second only to Texas. Therefore, 51% of feral swine are seropositive for pseudorabies in Florida, while viral shedding or elimination occurs in approximately 7% of the population through multiple specific routes (blood, oro-nasal, genital), highlighting the actual risk of infection and death posed by feral swine to other species (Hernández 2017).

Evidence suggests that wildlife and companion/working animals have been impacted by pseudorabies in this state. Numerous public hunting areas in Florida allow “hog dogs,” dogs that are trained to track feral swine. Reports of hog dogs contracting and dying from pseudorabies occur every year throughout the state (e.g., www.promedmail.org, archive no. 20081118.3637), but the magnitude of animal deaths is unknown. The endangered Florida panther is also at risk of death from exposure to pseudorabies, associated to their predation on feral swine and likely consumption of hunter-killed carcasses. As of 2014, four Florida panthers have been confirmed to have died from pseudorabies. Another 14 are suspected to have died from pseudorabies, but lab results were inconclusive (Glass et al. 1994; M.C. Cunningham, unpublished data).

**Decreasing the Risk of Exposure**

Eliminating swine-borne diseases such as pseudorabies from Florida is likely an unrealistic goal given the pervasive and generalist nature of feral swine at both natural and anthropogenic landscapes in Florida (Hernández 2017). Steps can be taken, however, to reduce disease prevalence and the risk of exposure to pets and livestock:

1. **Reduce numbers of swine through animal control,** especially on rangelands where livestock are at greatest risk.

2. **Keep feral swine away from congregating livestock animals,** for example, at pens, milking barns, and feed areas.

3. **Eliminate translocation of feral swine to reduce spread of diseased animals into populations free of pseudorabies.**

4. Do not feed offal or uncooked meat to dogs or other pets.

5. **Minimize contact between feral swine and hunting dogs.**

A note to hunters: Although pseudorabies in feral swine does not pose a risk to humans, other diseases carried by pigs such as brucellosis can make people very ill. Wear gloves when handling uncooked meat or other carcass parts of feral swine, and if blood or other bodily fluids come into contact with your skin or mucous membranes, wash the affected area immediately and contact your doctor. In addition, keep pets away from swine carcasses or live feral swine, and do not feed pets raw meat from feral swine.

This publication is the first in a series on *Wildlife Diseases: Risks to People and Animals.*

**References**


