

Pseudorabies and Brucellosis Problems in Feral Swine

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The distribution and density of feral swine populations are increasing rapidly throughout many parts of the United States. Surveys conducted by SCWDS in 1988 indicated that feral swine populations were established in portions of 18 states, primarily in the Southeast, California, and Hawaii. Since then, feral swine have become more widespread in the southeastern states, and new populations have been reported in Illinois, Indiana, Kansas, Missouri, Ohio, and Oregon. Although local expansion of feral swine populations can occur naturally, anecdotal evidence suggests that expansion in the Southeast and into the Midwest may have been augmented by translocation of feral swine by hunters. The expansion of feral swine populations presents numerous epidemiological challenges because the pigs carry a variety of diseases that can infect wildlife, livestock, and humans. Pseudorabies and swine brucellosis are two diseases of feral swine that are of particular interest to livestock producers. In the case of swine brucellosis, humans also are at risk. The role that feral swine can play in pseudorabies and swine brucellosis epidemiology provides a glimpse into one of the numerous problems posed by expanding feral swine populations.

Pseudorabies

Pseudorabies (PRV) is an infectious disease of swine caused by porcine herpesvirus-1. Also known as Aujeszky's disease or "mad itch," PRV rarely causes morbidity or mortality in adult swine but frequently causes abortion in pregnant sows and death of neonatal piglets, especially in naive domestic herds. Infection of domestic swine usually occurs by oronasal or aerosol transmission, but feral swine most often are infected via venereal transmission. Once infected, swine are carriers for life, sporadically shedding virus in the saliva and/or reproductive mucosa. PRV does not appear to limit the growth of feral populations and, once infected, populations remain infected indefinitely. In secondary hosts, such as cats, cattle, dogs, goats, and sheep, PRV produces an acute, fatal infection of the central nervous system marked by pruritus, convulsions, excessive salivation, and other rabies-like symptoms (hence the name pseudorabies). PRV does not affect humans, but it has been implicated as an infrequent cause of mortality among numerous wildlife species including coyotes, black bears, brown bears, mink, raccoons, and the endangered Florida panther. Transmission to secondary hosts probably occurs from ingestion of contaminated feed or carcasses or possibly from bite wounds obtained during aggressive encounters. Despite the severity of disease in secondary hosts, reports of infection in wildlife and domestic animals other than swine are rare. Potential effects of PRV on wildlife populations are unknown.

PRV is of considerable interest to swine producers worldwide because of the economic losses associated with reduced productivity and piglet fatalities. The U.S. Department of Agriculture initiated a nationwide PRV eradication program in 1989, and the disease has been virtually eliminated from U.S. domestic swine herds; however, PRV has been reported in feral swine from at least 10 states. The persistence of infection in feral populations, coupled with their expanding geographical distribution, has created the potential for reintroduction of virus to domestic herds. As such, spatiotemporal separation of feral and domestic swine is necessary to guarantee that feral swine will not reinfect PRV-free domestic herds.

Swine Brucellosis

Swine brucellosis is an infectious disease of pigs caused by the bacterium *Brucella suis*, one of at least six closely related species of *Brucella* that cause disease in a variety of wild and domestic mammals worldwide, including humans. *Brucella suis* should not be confused with *B. abortus*, which causes Bang's disease, a serious disease of domestic cattle. Of the five *B. suis* biovars identified to date, biovars 1, 2, and 3 can infect swine. Transmission occurs sexually, through ingestion of water or feed contaminated with reproductive fluids, or by suckling of piglets on infected sows. Acute infection of swine with *B. suis* results in systemic infection and/or localized infection of the reproductive organs and skeletal joints, often leading to abortion in pregnant sows. As with PRV, morbidity and mortality due to swine brucellosis are rare in adults, and most acutely infected swine appear perfectly healthy; however, some swine develop chronic infections, characterized by infertility, posterior paralysis, and/or swollen genitalia and joints. Such animals may shed the bacteria intermittently throughout life and repeatedly infect other swine within a herd. Swine brucellosis does not appear to limit the growth of feral swine populations. Domestic cattle, dogs, fowl, and horses are potential secondary hosts for *B. suis*, but morbidity and mortality among these animals are rare. Nonetheless, infected secondary hosts can transmit the disease to healthy swine herds or humans.

In addition to domestic animals, *B. suis* is infectious to a variety of other species. Non-porcine wildlife species serve as reservoirs for three of the five *B. suis* biovars. European wild hares are infected with biovar 2 in areas where their range overlaps with European wild boars; caribou and domestic reindeer are infected with biovar 4 throughout arctic Alaska, Canada, and Russia; and small rodents in the Caucasus region of Asia are infected with biovar 5. Biovars 1, 3, and 4 are pathogenic to humans with symptoms including malaise, loss of appetite, myalgia, depression, and intermittent fever. Traditionally, brucellosis was an occupational hazard for abattoir workers, farmers, and veterinarians. Hunters can reduce their risk of contracting swine brucellosis by wearing rubber gloves while field dressing feral hogs and by cooking the meat thoroughly.

Human health concerns and financial losses to livestock producers led to a cooperative state and federal brucellosis eradication program that began in 1934. Since its inception, human infections with all *Brucella* species in the United States have dropped from a high of more than 6,000 in 1947 to approximately 100-200 cases annually. Bovine and swine brucellosis have been almost eradicated from domestic livestock in the United States; however, bison and elk in the Greater Yellowstone Area are infected with *B. abortus* and feral swine are the primary reservoir for *B. suis*, particularly in the southern portion of their range.

Infected feral swine populations, which have been expanding via natural dispersion and human-assisted movements, are potential reservoirs for transmission of PRV and *B. suis* to domestic pigs. Although federal law prohibits interstate translocation of feral swine unless they have tested negative for PRV and brucellosis, the law is difficult to enforce and anecdotal evidence suggests that it frequently is violated. In areas where feral swine exist, appropriate biosecurity measures are the best way to prevent transmission of PRV and *B. suis* from feral to domestic swine. In areas where feral swine do not yet exist, wildlife agencies, livestock interests, and sportsmen should do their best to prevent them from being established. Not only do feral swine pose disease risks, they also compete with native wildlife for resources and cause damage to agricultural crops and natural ecosystems. (Prepared by Clay George)