

PUBLIC HEALTHWORKER SAFETY

Title: Serological Surveillance of Wild Boars for *Trichinella spiralis* – NPB #08-216

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Scientific Abstract:

Trichinella spiralis and *Toxoplasma gondii* are important zoonotic parasites, occurring in warm blooded animals and humans worldwide. Among domesticated food animals, domestic pigs and wild carnivores are hosts for *Trichinella*, while pigs, chickens, sheep, and goats are known to be infected with *T. gondii* at varying rates, depending on husbandry. Infections in wildlife with these parasites are generally higher than in domesticated species, however, infection rates in feral swine are unknown. Feral swine are attracted to and have direct contact with non-biosecure domestic swine, which presents opportunity for disease transmission. It is therefore important to determine the prevalence of *Trichinella* and *Toxoplasma* infection in feral swine to understand the risk of transmission of these parasites to domestic swine with which feral swine commingle. A cross-sectional serological survey was conducted to estimate the prevalence of *Trichinella* spp. and *Toxoplasma gondii* in feral swine in the U.S., and risk factors associated with infection. A total of 3262 serum samples were collected from feral swine in 32 states; results are reported from 26 states. Predictive maps based on environmental conditions using the maximum entropy (Maxent) approach to species distribution modeling were created for each parasite to highlight geographical areas with high probability for occurrence of infection. The overall seroprevalence of antibodies to *Trichinella* spp. and *T. gondii*, indicating infection, was 3.0% and 17.5%, respectively. A small proportion of feral swine (0.6 %) was seropositive for both parasites. No significant difference in infection level between male and female swine was observed for either parasite. The seroprevalence for *T. gondii* infection was significantly higher in adults than in sub-adults or juveniles ($p < 0.05$); this trend was not observed in *Trichinella* infected swine. *Toxoplasma* seropositive feral swine were widespread across the South and Midwest, and more restricted in the arid West. *Trichinella* infection was significantly higher in the South than in the Midwest, and higher in the Midwest than in the West region ($p < 0.05$). Species distribution modeling indicated that the most probable distribution areas for both parasites are similar, concentrated mostly in the South and the Midwest regions of the U.S. It is concluded that feral swine pose a significant risk for introduction of *Trichinella* and *Toxoplasma* into domestic herds of non-biosecure domestic swine as a result of increasing overlap of the range of feral swine with non-biosecure domestic swine production facilities in the U.S.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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