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BRUCELLOSIS IN FERAL SWINE

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Abstract: Some 255 feral hogs were serologically tested for *Brucella* titers at a location in the lower coastal plain of South Carolina. Eighteen percent were reactors. The organism was cultured from lymph node tissues in one 3+ years old boar and identified as *Brucella suis* biotype 1. Prevalence of sero-positive animals increased with age. There were no important differences between sexes.

INTRODUCTION

Feral swine (*Sus scrofa domesticus*) are geographically spread from east Texas to Florida and north to coastal Virginia. Although largely restricted to river bottoms and swamps of the coastal plains, occasionally they interact with man and domestic swine. Therefore, the opportunity for transmission of disease during interaction is quite probable.

The work described here is the first report of brucellosis in feral swine in the continental United States. Titers to *Brucella* were discovered during a study of the ecology of the feral hogs of Hobcaw Barony near Georgetown, South Carolina. The Hobcaw population was estimated at 300 to 500 animals. Since no domestic hogs have been kept on this property for at least 20 years and since fences and natural barriers limit immigration, diseases currently in the herd probably are endemic.

Hobcaw Barony is a 7100 ha refuge in the lower coastal plain of South Carolina. About 3000 ha are forested, the remainder consists of freshwater and saltwater marshes. The area is a peninsula bounded by Winyah Bay to the west and south, and the Atlantic Ocean to the east. The flora and fauna of Hobcaw are typical of the South Carolina coastal plain. One exception is the high density of feral hogs. Hunting on Hobcaw is prohibited; thus the main factor controlling most other wild hog populations is not in effect.

MATERIALS AND METHODS

As part of the ongoing ecological studies of feral hogs, animals were captured and marked to estimate the population. Following discovery of titers to *Brucella*, blood samples were taken from all captured animals. The first two serologic reactors were necropsied and tissues were submitted to the Clemson Universtiy Livestock and Poultry Laboratory for *Brucella* isolation.

Following identification in culture, only serologic testing was carried out. Samples collected in the field were taken to the laboratory and centrifuged at 2500 rpm for 10 min. Serum samples were then tested for antibodies to *Brucella* using the card test (Buffered *Brucella* Antigen Test).[10] Portions of each sample were shipped to the Clemson University Livestock and Poultry Laboratory for the complement fixation test[2] and the Rivanol Precipitation Test.[11] All reactors to the card test were considered positive. Of the 255 sera examined, in only 3 instances did the laboratory test and field card test disagree. Card test reactors were killed and the carcasses buried.

Most test animals were aged by the tooth replacement technique.[6,12] Due to inadequacies inherent in this technique in living animals, individuals were grouped into the most easily discernible age classes of less than 6 months, 6 months to 1 year, 1 to 3 years, and more than 3 years.

RESULTS

Two sero-positive animals were examined at necropsy. The first animal was a 3+ years-old boar collected in late July, 1974. No *Brucella* was obtained from material submitted for culture. The second animal was also a 3+ years-old boar collected in late August, 1974. *B. suis* biotype 1 was isolated from the lymph node tissues.

Between mid-July, 1974 and December, 1975, sera from 255 feral hogs were tested for brucellosis and 46 (18%) were positive. Table 1 shows the age and card test reactions of the 255 hogs tested. Three observations were noteworthy: first, among 53 hogs that were less than 6 months of age only 2 were serologic reactors: second, the prevalence of sero-positive animals increased with age; and third, there were no important differences between sexes in prevalence.

TABLE 1. Prevalence of **Brucella suis** titers in a sample population of 255 feral hogs.

	Number Tested	Number Reactors	Percent Reactors in Class	Percent Reactors in Female Pop.	Percent Reactors in Male Pop.
Females:					
<0.5 yrs	32	0	0	0	—
0.5-1.0 yrs	30	5	17	4	—
1.0-3.0 yrs	32	8	25	6	—
>3.0 yrs	32	11	34	8	—
Age unknown	7	0	0	0	—
TOTAL	133	24	—	18	—
Males:					
<0.5 yrs	21	2	10	—	2
0.5-1.0 yrs	32	3	9	—	2
1.0-3.0 yrs	35	10	29	—	8
>3.0 yrs	27	6	22	—	5
Age unknown	7	1	14	—	1
TOTAL	122	22	—	—	18
Total Population:					
<0.5 yrs	53	2	4	—	—
0.5-1.0 yrs	62	8	13	—	—
1.0-3.0 yrs	67	18	27	—	—
>3.0 yrs	59	17	29	—	—
Age unknown	14	1	7		

DISCUSSION

Concern that feral hog populations might function as reservoirs for disease has been expressed in Australia,[9] New Zealand[4,5] and the United States.[1,8] Nichols[8] found 10 of 42 feral hogs in Hawaii had titers between 1:20 and 1:40 when tested by what he termed macroscopic agglutination with a *B. abortus* antigen. He did not discuss the ramifications of the disease in a wild herd in the ecosystem. However, high rates of reproduction and the potential to interact with man and domestic swine provides considerable justification for concern about transmission of disease.

Martin[5] considered that feral hog movement in New Zealand was an important factor if the animal was acting as a disease vector. He found that boars travelled an average linear distance of 3.2 ± 2.6 km, while sows only moved 0.5 ± 0.14 km. Kurz and Marchinton[3] reported that feral boars in the upper coastal plain of South Carolina had an elliptical home range with an average major axis of about 3 km. Our preliminary findings are similar; boar movements appear to be about twice as extensive as sows. Thus, the probability of disease transmission between feral and domestic populations is not great if the feral populations are remotely located.

Now that proof of brucellosis infection in feral swine has been established a number of considerations should be made. First, any program for the control or eradication of this disease in domestic swine should also take these wild populations into account. Second, in serologic surveys, ages of the test animals should especially be considered. Reactors in our sample of animals less than 6 months of age was less than 4% while reactors in the population was 18%. If serologic titers to *Brucella* are present they will most likely be found in animals that are more than 1 year old.

A third concern is for the capture and sale of feral swine to shooting preserves. The data of Matschke and Hardister[7] indicated that transplanted European wild boar (*Sus scrofa cristatus*) moved as much as 22 km from the release site. In a similar situation the potential of infected hogs to spread or introduce brucellosis is obvious.

Lastly, excessive numbers of feral hogs can pose important competition with game animals for food resources as well as have deleterious effects on commercially important tree species such as longleaf pine (*Pinus palustris*). Since *B. suis* is particularly pathogenic for man, this disclosure of the disease in wild hogs may act as a deterrent to convenient means of needed population control.

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