



Feral Swine Disease Surveillance and Human Health in Florida

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Feral Swine Becoming a Public Health Issue

By David Vickers


















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La Junta, Colo. —

The American Sheep Industry Association issued a warning Tuesday that feral hogs now have tested positive for carrying pathogenic E. coli bacteria. The positive tests have elevated the problem with feral hogs to a public health issue.

Zoonotic Diseases Reportable to FL DOH

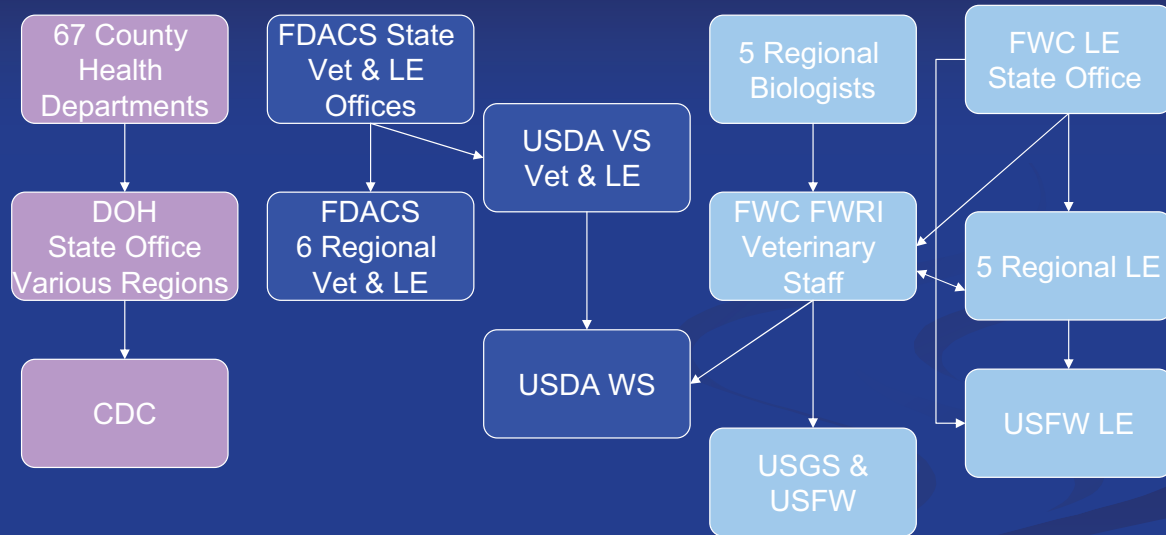
- Anthrax 
- Brucella 
- Campylobacter 
- Cryptococcus 
- E. coli 
- Glanders
- Hanta virus
- Hepatitis E 
- Giardiasis 
- Novel Influenza 
- Leptospirosis 
- *Strep suis* meningitis 
- Plague 
- Psittacosis / avian chlamydiosis
- Q fever
- Rabies 
- Salmonella 
- Toxoplasmosis 
- Trichinellosis 
- Tuberculosis  (bovine)
- Tularemia 
- Viral Hemorrhagic Fevers

Red font=also reportable to FDACS (animal)  Potential to be pig associated

Zoonotic Disease Partnerships



Organizational Structures



DOH Surveillance Tools

- Health Care Provider Reporting
- County Health Department reports
- Partner Reporting including universities and veterinarians
 - FDACS, FWC, CDC, USDA VS, USDA WS
 - FVMA, Veterinarians, and Universities (UF CVM/EPI, USF, U Miami, FSU, FAMU, etc.)
 - Exercises, Meetings & Trainings
- Electronic laboratory reports
 - Brucella
- Public reporting-county or state
- FDACS RAD reports
- On-line FWC-DOH Dead Bird
- FWC Fish Kill Hotline Reports
- DOH Epi-Com
- Syndromic Surveillance
- NASPHV listserv
- CDC: Epi-X & Quarantine Station, monthly on-line Zoonotic Dz meetings, MMWR, EID
- CSTE and other health organizations
 - Meetings & trainings

Inter-agency Plans, Exercises & Training

- Zoonotic
 - Zoonotic Influenza Plan
 - Template for other zoonotic diseases
 - Multiple Avian Influenza exercises
 - Rabies Guide
 - Satellite Broadcasts
- Vector-borne
 - Arbovirus Guide
 - Rift Valley Fever exercise
 - Satellite Broadcasts



Both, wildlife and domestic animals, contribute to the spreading of these zoonoses [brucellosis, tularemia and yersiniosis]. The surveillance of the animal health status is strictly regulated for domestic animals, whereas systematic disease monitoring in wildlife does not exist.

Seroprevalence of brucellosis, tularemia, and yersiniosis in wild boars (*Sus scrofa*) from north-eastern Germany.

[Al Dahouk S](#), [Nöckler K](#), [Tomaso H](#), [Splettstoesser WD](#), [Jungersen G](#), [Riber U](#), [Petry T](#), [Hoffmann D](#), [Scholz HC](#), [Hensel A](#), [Neubauer H](#).

What do we have?

Agent	FL Feral Swine*	Avg FL Human cases/yr**
<i>Balantidium</i>	Yes (10-29%)	?
<i>Toxoplasma</i>	Yes (3%)	Yes (11-14)
<i>Trichinella</i>	Yes (2.8%)	Yes (0-1)
<i>Trichostrongylus</i>	Yes (2%)	?
<i>Sarcoptes scabiei</i>	yes	?
Vesicular stomatitis virus	Yes (4 animals sero)	?
Hepatitis E Virus	?	Yes (<1)

What do we have?

Agent	FL Feral Swine	Avg FL Human cases/year
<i>Brucella suis</i>	Yes (~10-12%)	Yes (7-8)
<i>Leptospira</i>	Yes (15%)	Yes (1)
<i>Salmonella</i>	Yes (5%)	Yes (>5,000 cases/yr)

*Opportunistic sampling: involving primarily small sample sets with uneven geographic and temporal distribution

**Human cases are 10 year averages of reported cases.

Feral swine pig data primarily from Donald J. Forrester, *Parasites and Diseases of Wild Mammals in Florida*, 1992

Brucella suis Cross-Species Transmission



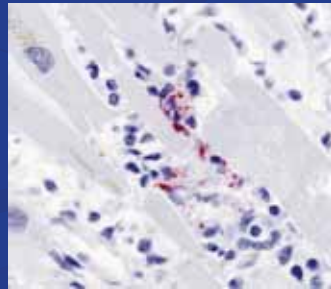
Photo credit Dr. Dix Harrell, USDA-APHIS, VS

Brucella suis Humans

- *B. suis* risk factors:
 - 81% (29) hunting, **handling raw hog meat**
 - 25% (9) cuts
 - 25% (9) eating hog meat; 2 undercooked
 - No gloves 6 / 2 with gloves
 - 1 vet tech, 1 taxidermist
- Time to Diagnosis
 - 9 wk mean; range 1-56 wk
 - 2 patients asked their doctor about testing

Brucella suis

- 17% FL cases in the past 10 years with endocarditis (infection in the heart) or serious blood vessel involvement
 - Fatal endocarditis 61 y.o.
 - Fatal endocarditis 48 y.o. (2009)
 - Fatal endocarditis 45 y.o. (1977)
 - Fatal brain vessel infection 46 y.o.
 - Paralysis 51 y.o. (1998 *Brucella* species-hunter)
 - 2 orchitis (infection of the testicles)
 - Also joint and bone infections



Chris Paddock CDC Pathology Lab

Treatment

- Antibiotics for at least 6 weeks with two or more antibiotics
- Treatment failure and relapses for *Brucella suis* in Florida 22%

Rabies

- Rare in pigs but bites are not
- Endemic in wildlife
- 6-12 bites / year
- Test or 14 day observation
- Rabies PEP \$1,000-\$\$\$\$
- Tetanus booster, wound treatment, possibly antibiotics



Leptospirosis Florida

- Exposure: direct animal contact or working in contaminated water
- Tropical wet areas
 - Multiple serovars
 - Environmental exposure important
- FL feral swine 15% (12/79)
- Flu-like symptoms
- 1 Fatal case 2009



Role in Vectorborne Dz?



Occupational Hazard



- Veterinarians / Animal Workers at greater risk for exposure to:
 - avian and swine influenza viruses, *Brucella* spp., *Coxiella burnetii*, avian and feline *Chlamydophila psittaci*, human and swine hepatitis E virus, MRSA, and *Bartonella* spp.
- Case reports
 - *Brucella* spp., *Salmonella* spp., bovine papular stomatitis virus, *Sporothrix schenckii*, *Blastomyces dermatitidis*, *Listeria monocytogenes*, *Leptospirosis interrogans*, *Trichophyton verrucosum*, Hendra virus and avian influenza virus

Direct Contact

- May have significantly higher prevalence in feral swine vs. domestic
- Many of these pathogens may have no or minimal gross lesions
- At risk groups (hunters, those handling meat, taxidermists, backyard farmers) unlikely to be aware of disease concern or use appropriate PPE

Zoonoses Prevention

- Avoid eating, drinking or using tobacco when field-dressing or handling carcasses.
- Use latex or rubber gloves when handling the carcass or raw meat.
- Avoid direct contact with blood, reproductive organs and fecal matter. Wearing long sleeves, eye protection and covering any scratches, open wounds or lesions will help provide protection.
- Clean and disinfect knives, cleaning area, clothing and any other exposed surfaces when finished.
- Wash hands frequently with soap and water.
- Cook meat from feral swine to 160° F or until juices run clear.
- Use good kitchen hygiene

Zoonoses Prevention

- Avoid human and domestic animal exposure or ingestion to water that may be contaminated with urine or feces from feral swine
- Prevent contact between domestic animals and feral swine
- Keep domestic animals up to date on appropriate vaccinations
- Wear insect and tick repellent while outside
- Rabies vaccination?
- Select a physician familiar with zoonotic diseases

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- Beth Radke, DOH EH

For More Information

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Zoonotic Diseases
<http://www.doh.state.fl.us/Environment/medicine/arboviral/Zoonoses/Zoonotic-index.html>
- CDC Brucella Information:
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/Brucellosis_g.htm
CDC Hunter Safety:
http://www.cdc.gov/Features/HuntingSafety/Brucellosis_and_HogHunters_508.pdf
- One Health: <http://www.onehealthinitiative.com/>