Comparative Study of *Theileria* spp. Phylogenies and Prevalence in Florida On- and Off-Ranch White-tailed Deer (*Odocoileus virginianus*)

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Introduction

- *Theileria* spp. are protozoan hemoparasites
- *T. cervi* infects white-tailed deer, causing theileriosis
- Vectored by ticks in the ixodid family, primarily *Amblyomma americanum*
- Maintain persistence within host due to constant exposure
- Theileriosis symptoms include asymptomatic infection, anemia, tissue damage, leukocytosis, and death
- Species other than *T. cervi* may infect white-tailed deer

Purpose

- To understand species of *Theileria* infecting deer
- Determine a relationship between prevalence and age of farmed deer
- Determine a relationship between deer density and prevalence

Methods

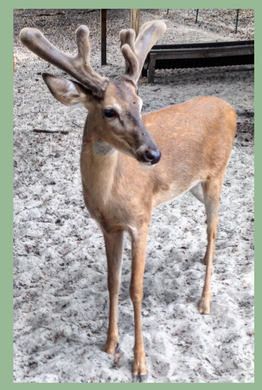
-DNA extracted from EDTA whole blood obtained via jugular venipuncture from 2016-2017 in on-ranch and off-ranch white-tailed deer in Florida
- Assayed using PCR, targeting V4 hypervariable region of 18s rRNA gene
-Visualization of results using gel electrophoresis
-Purified amplicons and submitted for Sanger sequencing

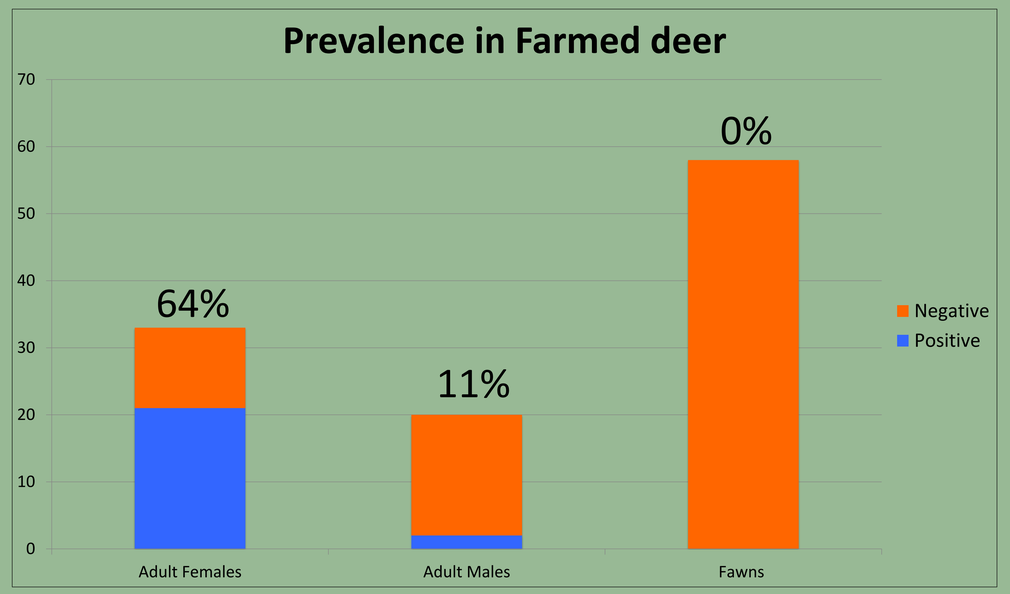
Farmed deer – 5-15 animals live in one-acre pens on-ranch, creating an artificially high density. They are subject to feed and chemical vector control.

Preserve deer – also living on-ranch; free-range on 408 acres with no controls. They represent a midrange density.

Off-ranch deer - wild and free-ranging, representing a low density population, and located in a wildlife management area.

Percent of adults positive for *Thileria spp.*	
Farmed	45% (23/51)
Preserve	71% (12/13)
Off-ranch	100% (41/41)
Total	72% (76/105)





Results

- No fawn tested positive, indicating there is no evidence for vertical transmission
- All off-ranch deer tested positive
- On-ranch tick control lowered prevalence of *Theileria* by over half
- Under normal conditions, *T. cervi* proved nonpathogenic
- evidence of naïve infection

Conclusions

Despite living in an artificially high density, farmed deer had the lowest prevalence of *T. cervi*, providing evidence that the use of acaricides are effective in reducing the incidence *Theileria* in deer.

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