

# Cross-sectional study of Kansas beef bulls to model association between chronic bovine anaplasmosis and breeding soundness



PRESENTER:  
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## Introduction

- Anaplasma marginale* is a tick-borne blood pathogen endemic in Kansas cattle herds. After clinical disease with fever, anemia, lethargy and weight loss, animals become persistently infected, chronic carriers.
- Research shows that clinical disease transiently reduces breeding soundness, though the impacts of carrier status on bull breeding soundness and prevalence of *A. marginale* in breeding bulls in Kansas has not been investigated.
- Objective:** Determine prevalence of carrier bulls in Kansas and whether bulls with chronic *A. marginale* infection have lower BSE outcomes

## Materials & Methods

- Bull sample set:** 535 producer-owner beef bulls (from 14 KS counties, 89 producers) undergoing routine BSEs per Society for Theriogenology guidelines
- BSE performers:** 8 participating veterinarians
- Blood samples:** *Anaplasma marginale* qPCR, cELISA, and packed cell volume (PCV)
- A. marginale*-vaccine status** noted where available
- Maximum **temperature humidity index (THI)** for the day recorded

## Results

- Prevalence of *A. marginale* carriers in this population of bulls was 46% (qPCR). Seroprevalence was 52.7% (cELISA). Test agreement was high ( $\kappa$  0.9213).
- Carrier status was significantly associated with **BREED** and **AGE** GROUP, not packed cell or vaccine status.
- BSE outcome was not significantly affected by carrier status in bulls, but more *Am*(+) bulls failed BSEs.
- 12.5% of bulls failed BSE, majority of which (52.5%) due to semen quality alone.
- Scrotal circumference was significantly affected by age.

## Conclusions

- A. marginale* carrier status was not associated with breeding soundness in this bull population.
- Bull age significantly influences scrotal circumference, sperm motility, and *A. marginale* carrier status.
- Study results are dependent on consistent BSE – perhaps cost of disease is observed *during* breeding season, not just at BSE.

## Future Studies

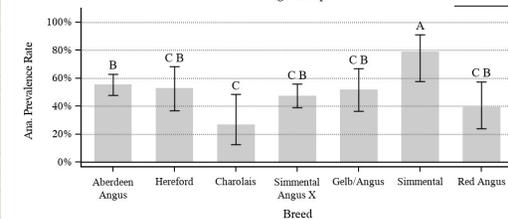
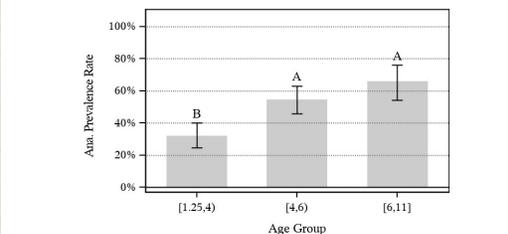
- Consistency of BSE performance in the same population of bulls among different veterinarians
- BSE outcomes from acute anaplasmosis to chronic carrier status for productive life of individual bulls
- Prevalence data for bulls from seedstock producers & cattle from herds receiving such bulls

# Nearly 50% of bulls in Kansas are carriers for *Anaplasma marginale*.

# Carrier status does *not* affect breeding soundness outcome in apparently healthy bulls.

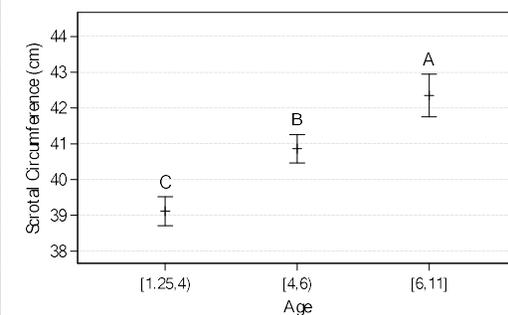


Bull scrotum with feeding ticks.



Outcome	<i>A. marginale</i> PCR-Positive	<i>A. marginale</i> PCR-Negative
<b>BSE Fail Rate</b>	15% ± 2.4%	12% ± 2.2%
<b>Unsatisfactory motility</b>	6.3% ± 1.6%	3.5% ± 1.2%

Veterinarian	BSE		
	# of Bulls	# of Pass Bulls	Passing Rate
8	151	139	92%
1	142	131	92%
2	99	68	69%
6	82	76	93%
7	57	51	89%
<b>Total</b>	<b>531</b>	<b>465</b>	<b>87%</b>



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