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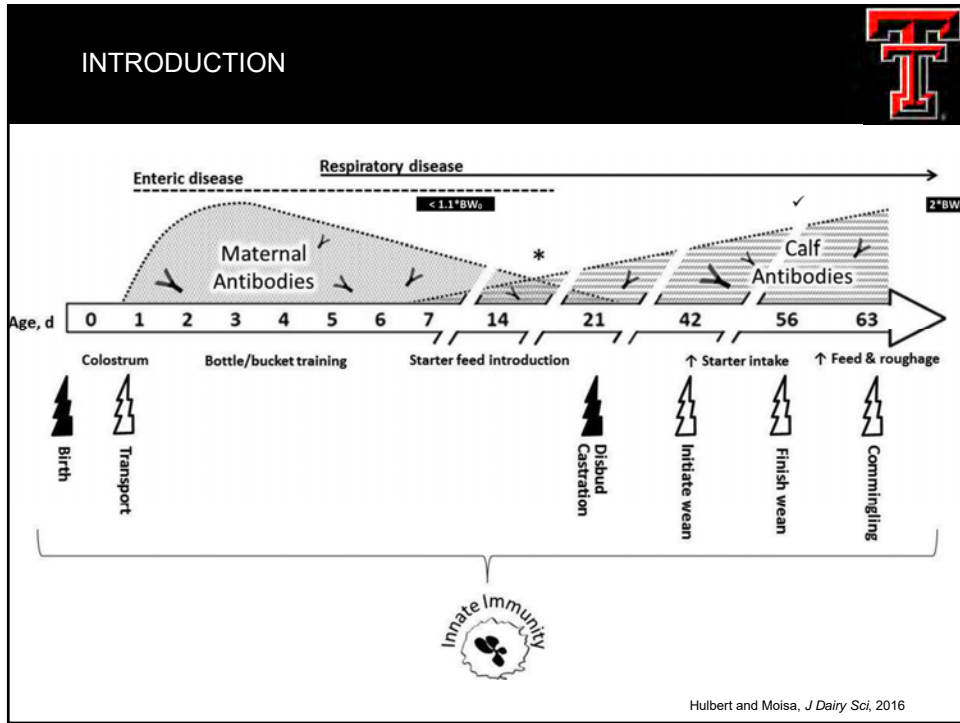
OUTLINE

- Introduction
- Common health issues
  - *BRD and diarrhea*
  - *Metagenomic studies*
- On going research at TTU

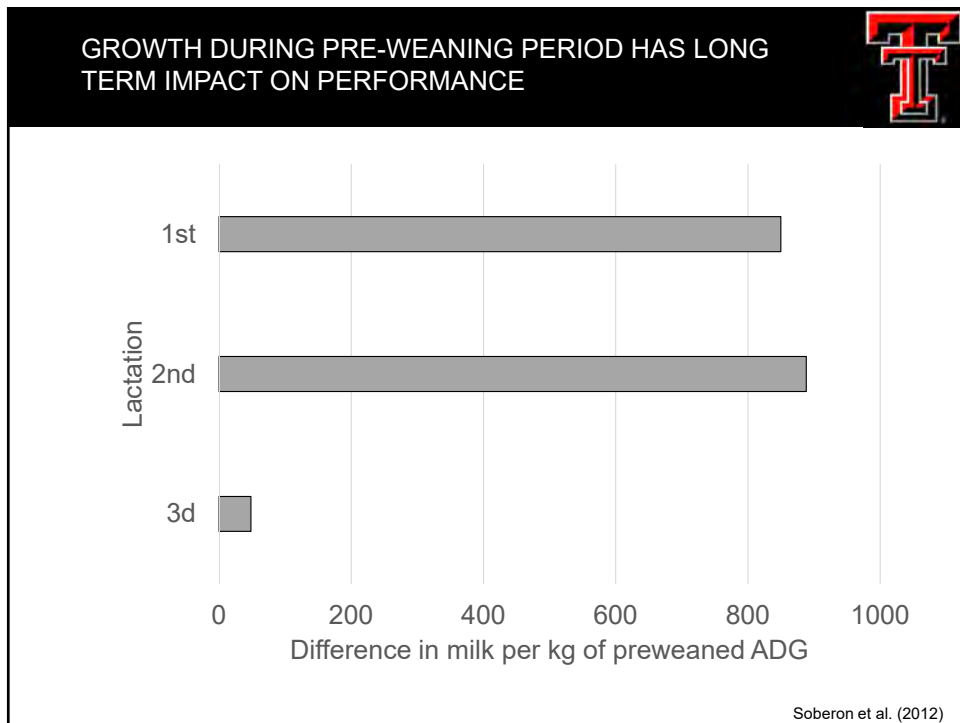


The slide features a black header with the word 'OUTLINE' in white. To the right of the header is the Texas Tech University logo. Below the header is a list of three main bullet points, with the second one having two sub-bullets. At the bottom of the slide is a photograph of a dairy farm, showing rows of white calf hutches in the foreground and middle ground, with two large metal silos in the background under a clear sky.

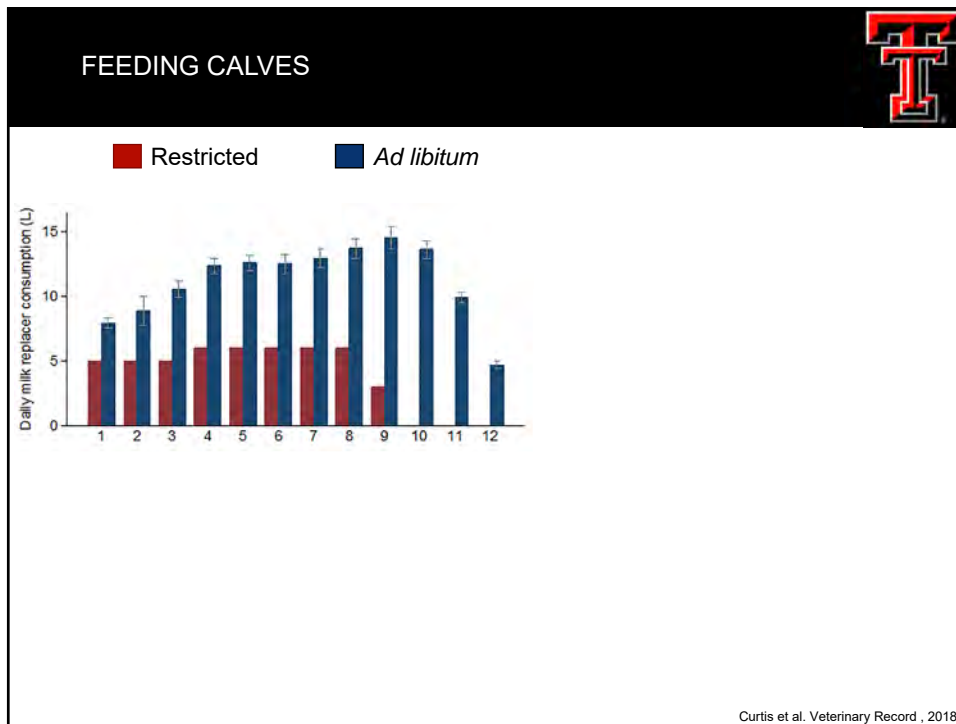
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### COMMON HOUSING SYSTEMS

Individual pens



Group pens



- Goals:
  - *Deep, clean and dry bedding*
  - *Good ventilation / air quality*

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## INDIVIDUAL HOUSING



- Pros:
  - *Isolated animals*
  - *Decreased disease / pathogens transmission*
  - *Easy to monitor milk consumption and health*
- Cons:
  - *Feeding is labor intensive (ad libitum systems often not practical)*
  - *Cleaning is hard and labor intensive*
  - *Welfare / socialization / public perception*



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## GROUP HOUSING




- Pros:
  - *Easy to clean*
  - *Easy to adopt ad libitum feeding systems*
  - *Socialization and public perception*
- Cons:
  - *Transmission of pathogens*
  - *Difficult to monitor intake*
  - *Difficult to detect sick animals*



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**DIFFERENT HOUSING SYSTEMS – DIFFERENT CHALLENGES**

**Individual pens**



- Lower incidences of disease
- Difficult to feed

**Group pens**

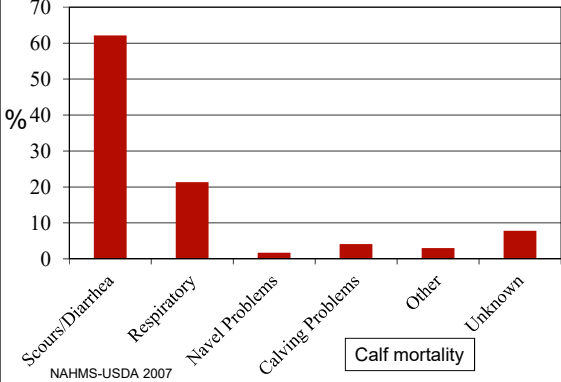


- Higher incidences of disease
- Higher feed intakes

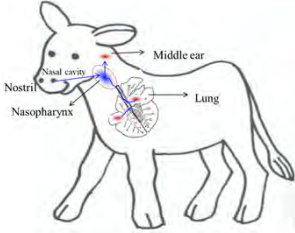
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**COMMON HEALTH ISSUES**

- Diarrhea – Scours
- Bovine respiratory disease
  - *Pneumonia – Otitis*

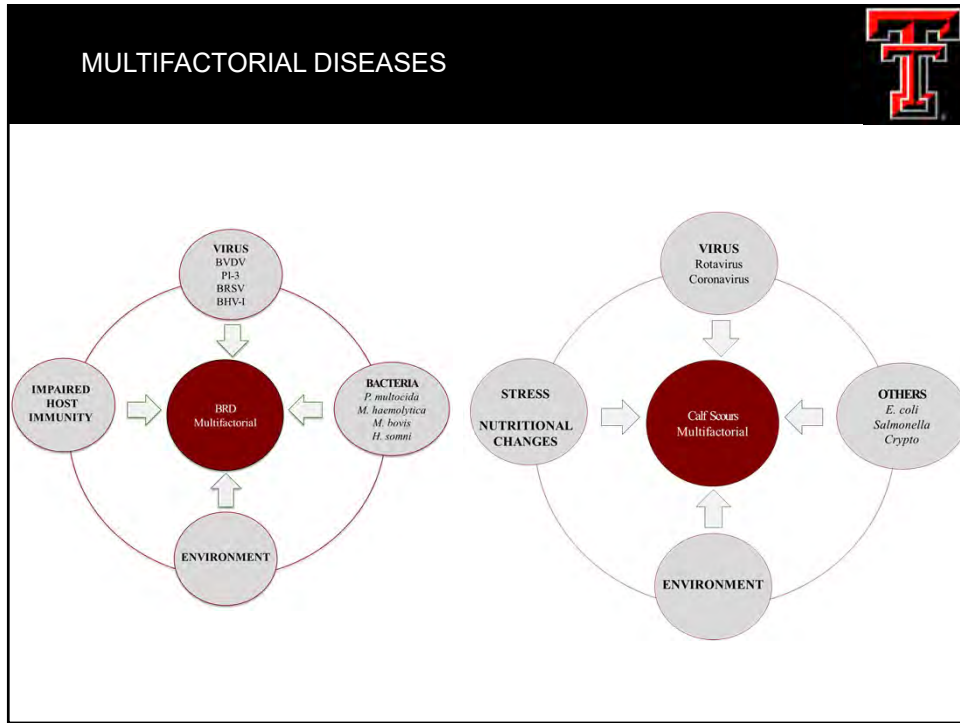


Health Issue	Percentage (%)
Scours/Diarrhea	~62
Respiratory	~22
Navel Problems	~2
Calving Problems	~5
Other	~4
Unknown	~8

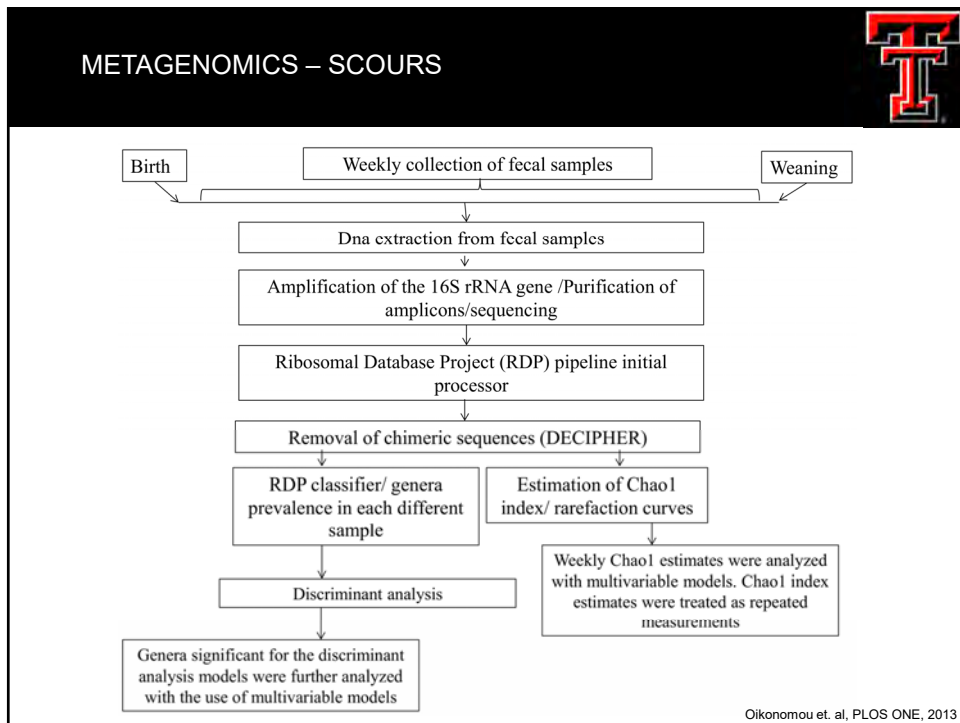


nasopharynx is connected to the middle ear via the Eustachian tube

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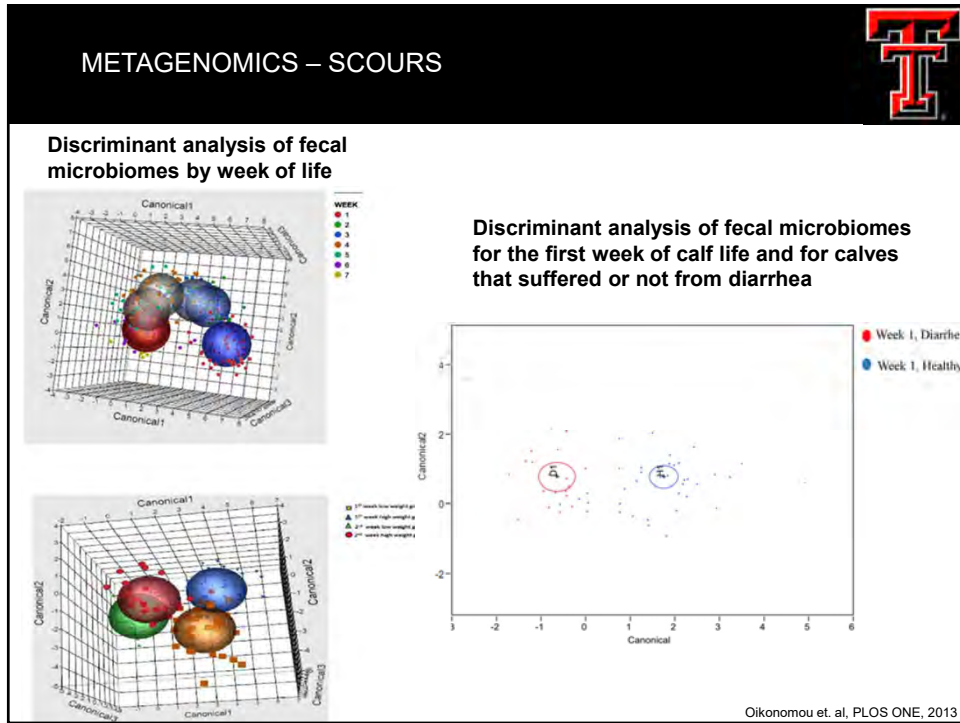


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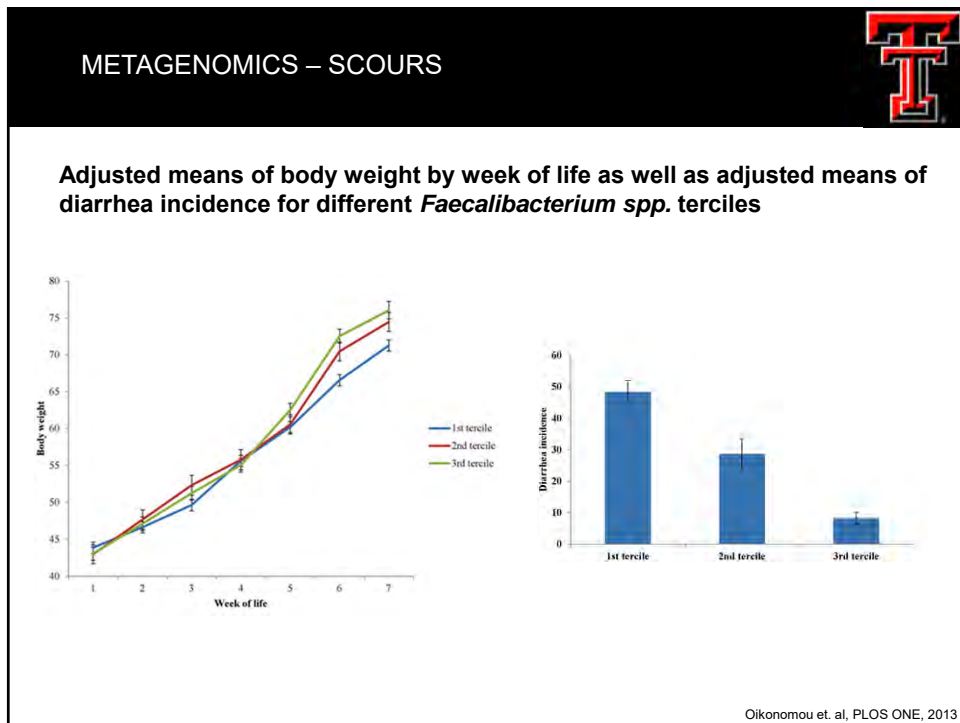


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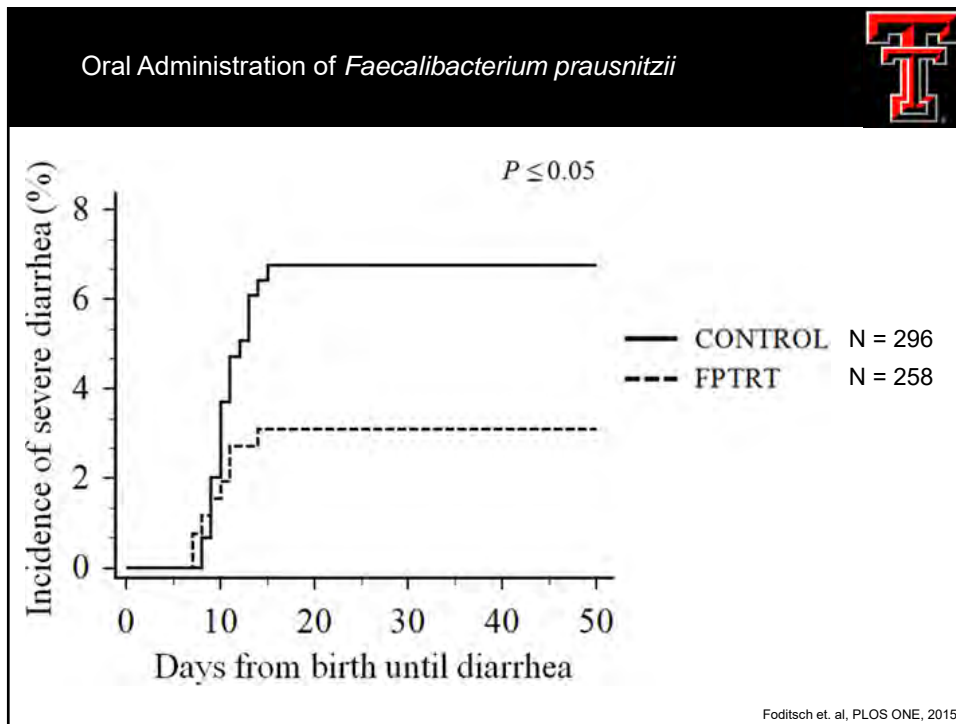




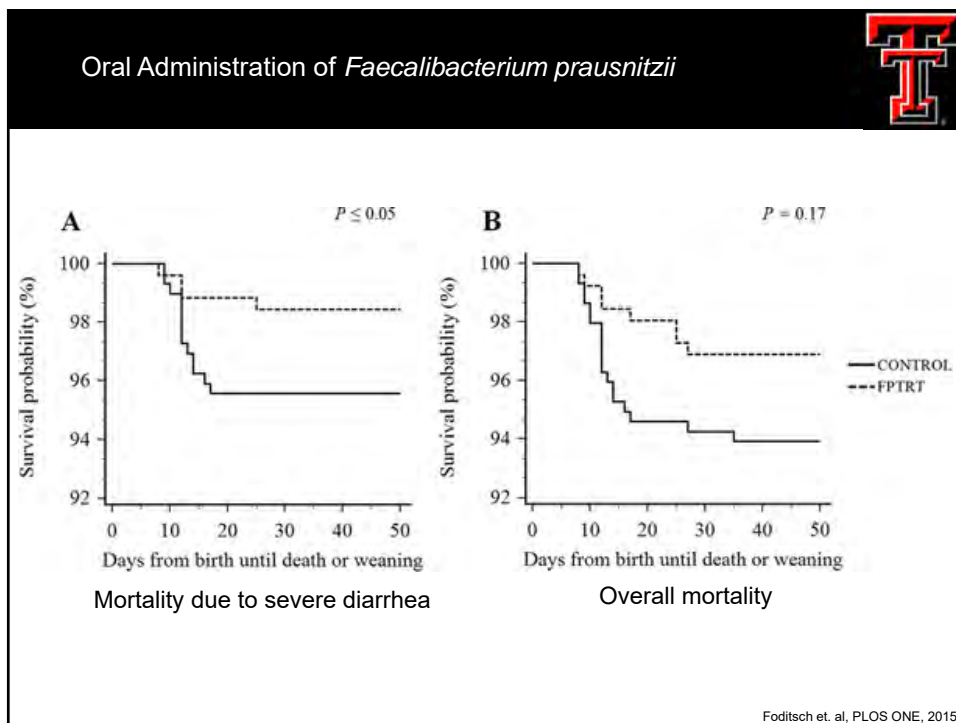
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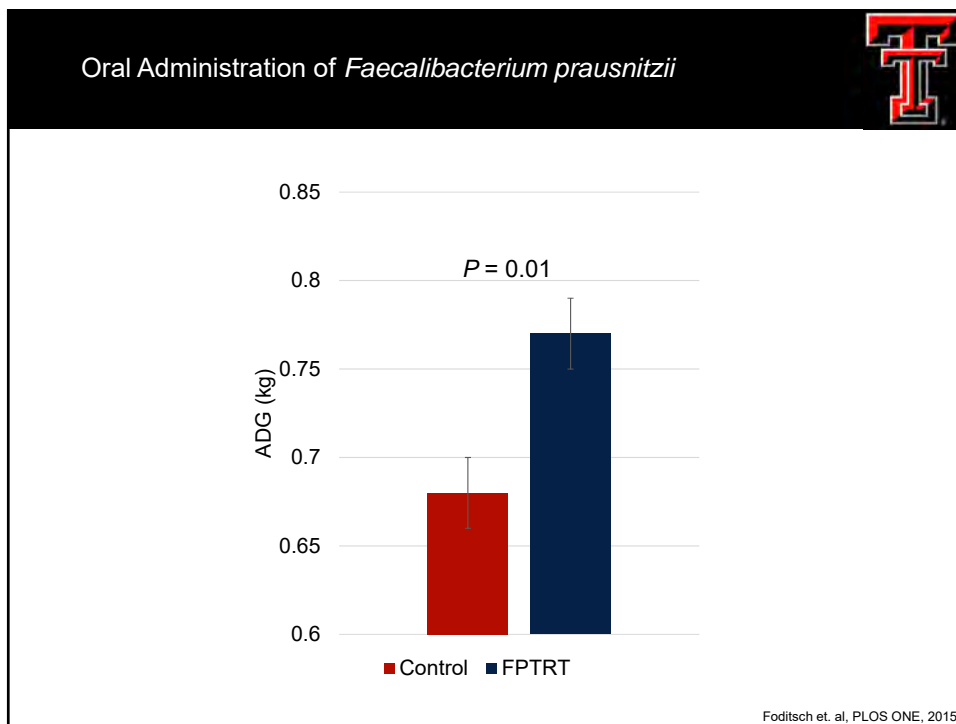


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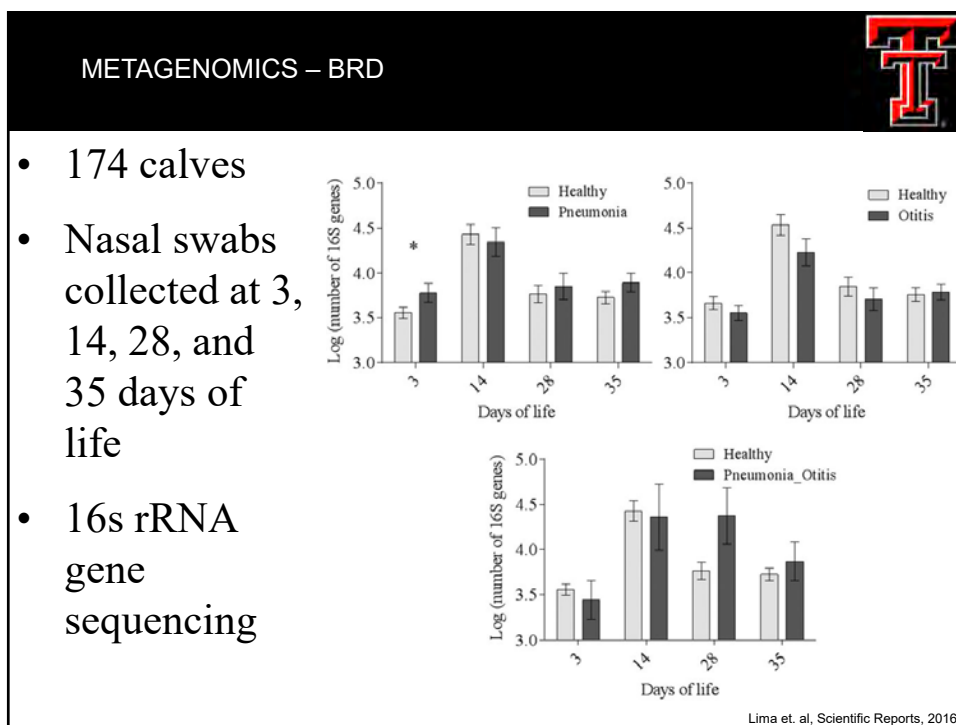


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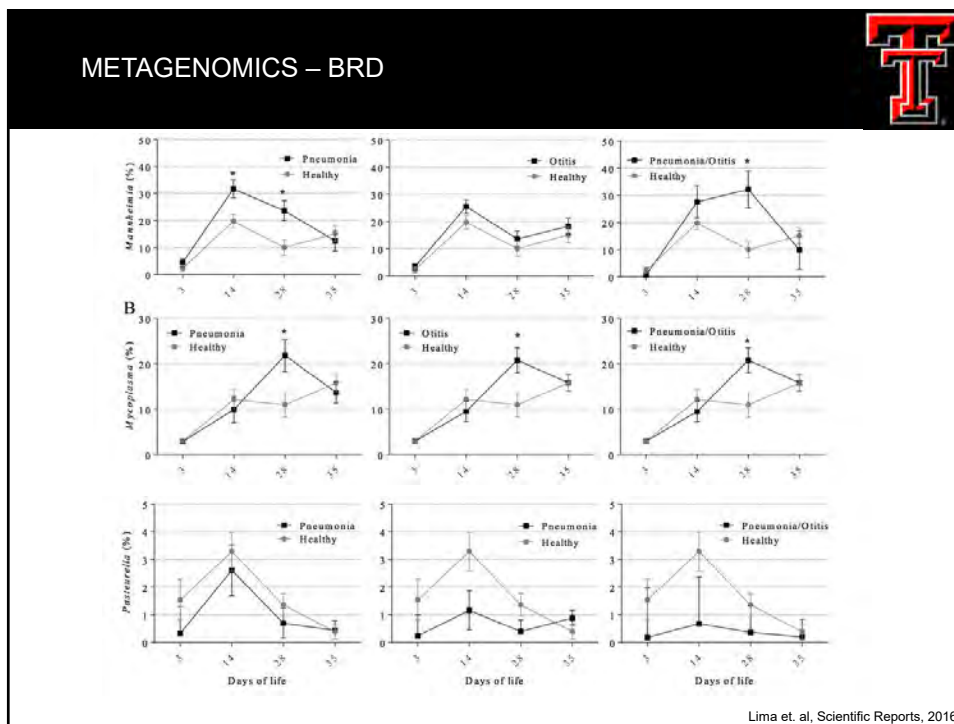




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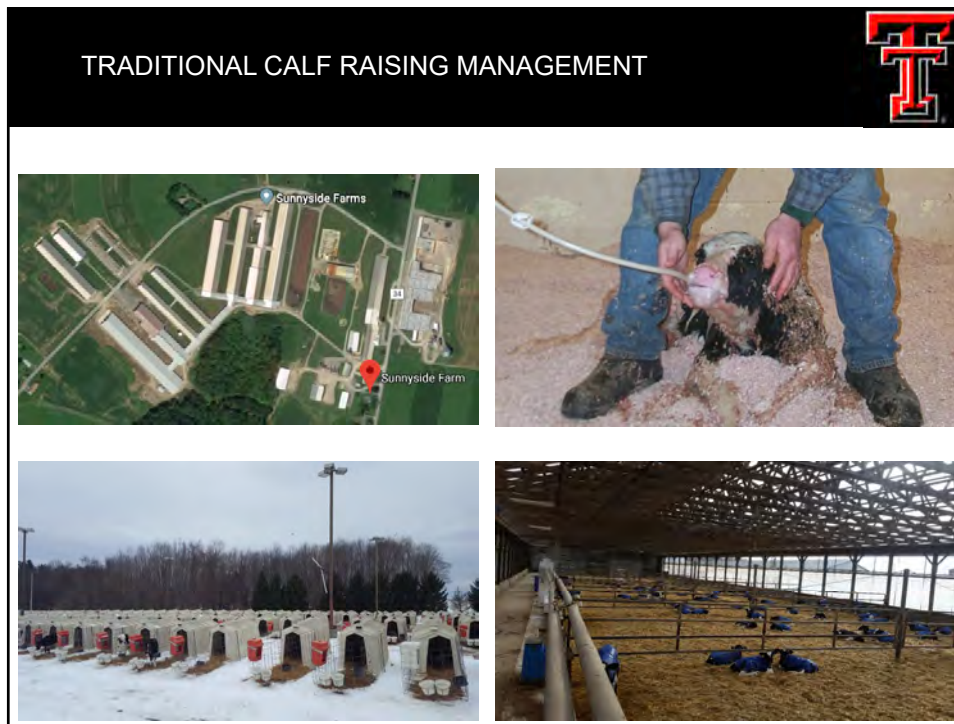
### METAPHYLAXIS – BRD

- CTR = untreated
- M1 = one tildipirosin injection administered at 10 days of life
- M2 = two tildipirosin injections at 10 days and 35 days of life

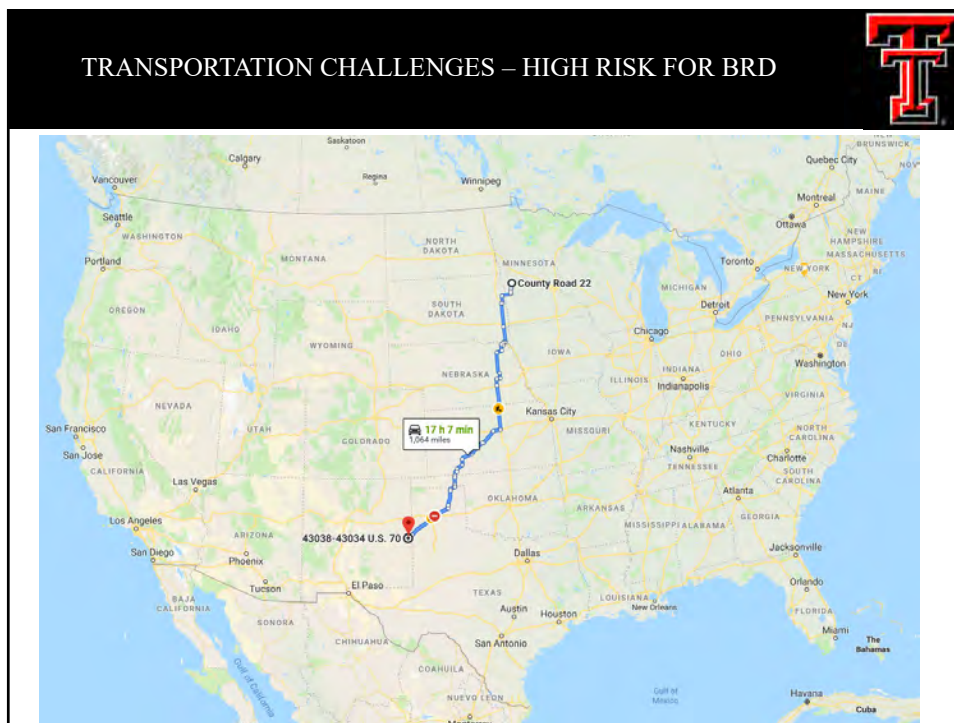
		Hazard ratio (95% confidence limit)	P value
Mortality	CTR	Reference	
	M1	0.51 (0.30–1.13)	0.11
	M2	0.62 (0.28–1.29)	0.21
BRD	CTR	Reference	
	M1	0.68 (0.47–0.97)	0.07
	M2	0.70 (0.49–1.01)	0.09
Otitis	CTR	Reference	
	M1	0.85 (0.67–1.23)	0.34
	M2	0.80 (0.62–1.15)	0.30
BRD and/or otitis	CTR	Reference	
	M1	0.70 (0.58–0.95)	0.009
	M2	0.72 (0.60–0.98)	0.01

Teixeira et. al, The Vet J, 2016

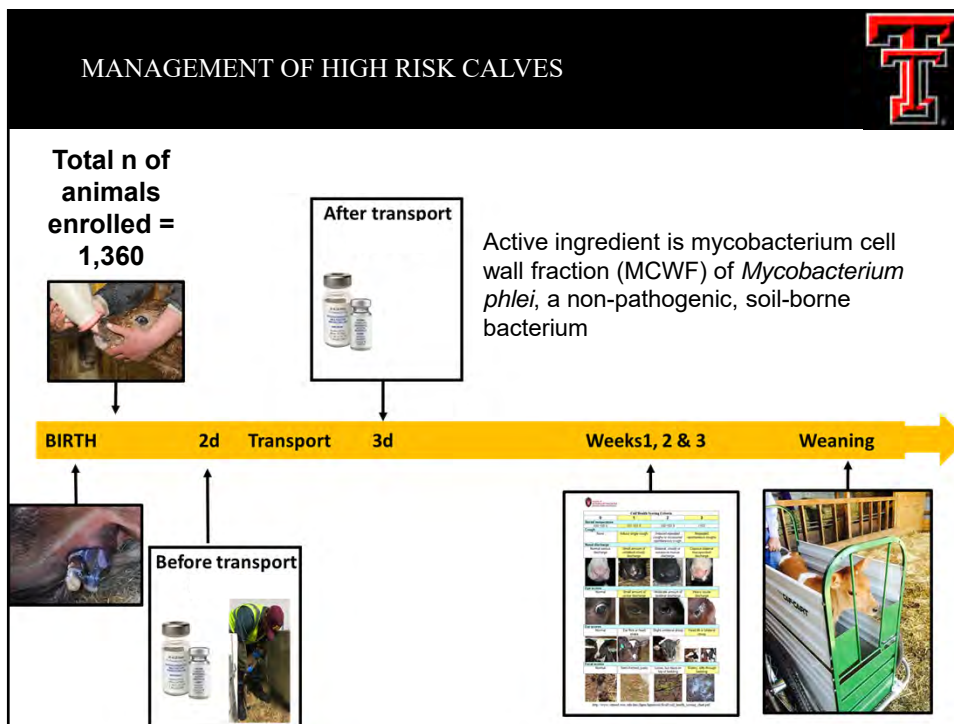
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### Disease treatment events were lower than the national average

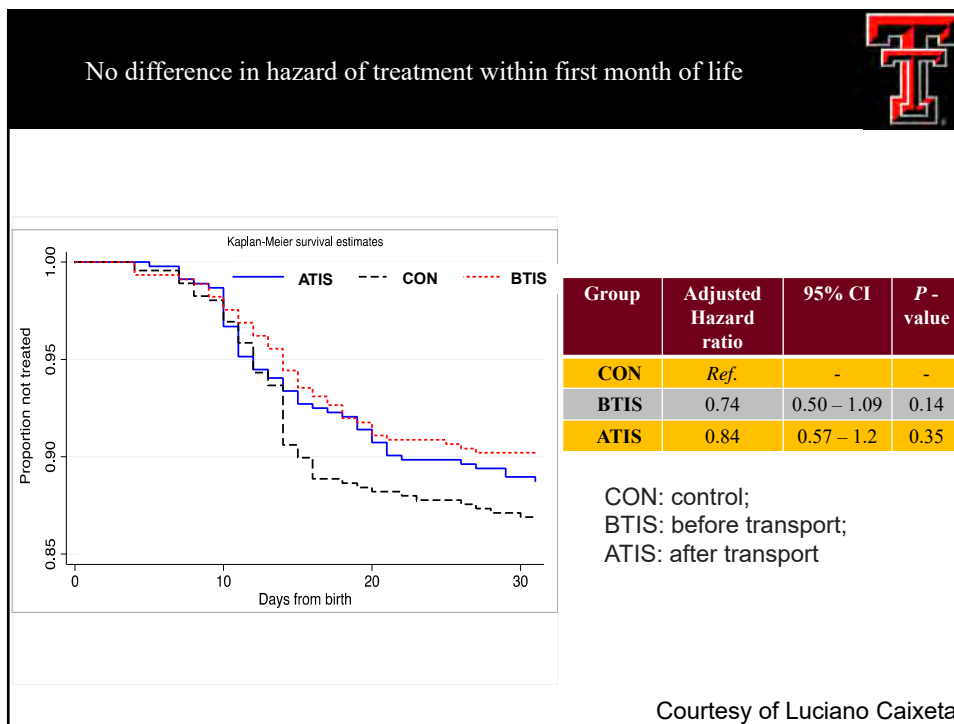
Item	Enrolled (%)	Treated (%)	Dead (%)
Calves	1,360	155 (11.3)	16 (1.2)
CON	458	60 (13.1)	6 (1.3)
BTIS	449	44 (9.8)	5 (1.1)
ATIS	453	51 (11.4)	5 (1.1)

CON: control; BTIS: before transport; ATIS: after transport

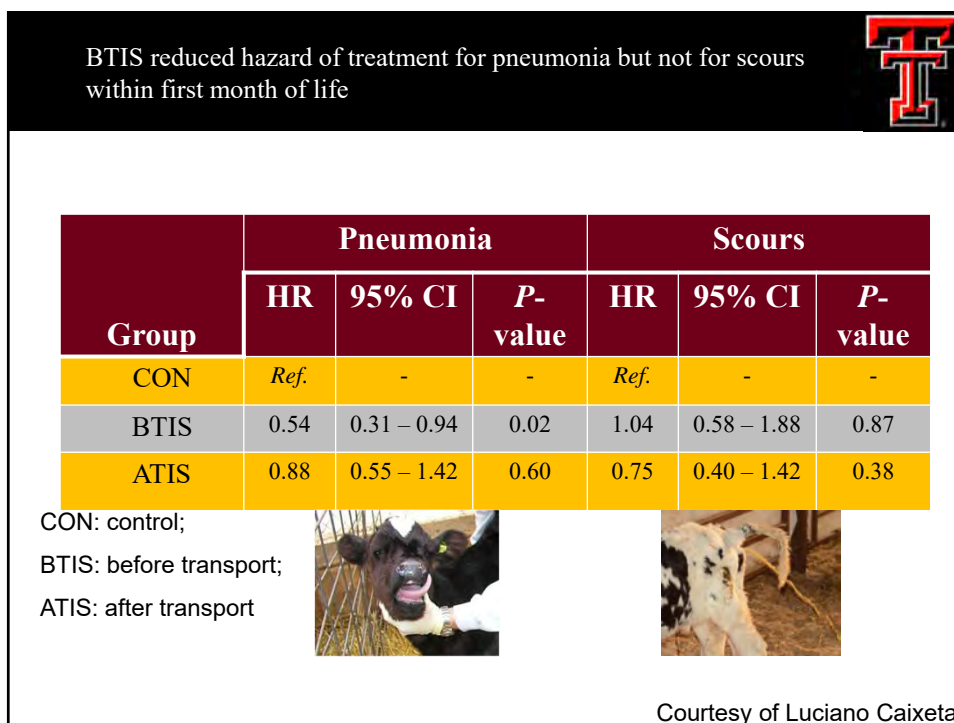
UNIVERSITY OF MINNESOTA

Courtesy of Luciano Caixeta

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SERUM BIOMARKERS OF STRESS AND INFLAMMATION  
AFTER TRANSPORTATION OF NEWBORN CALVES

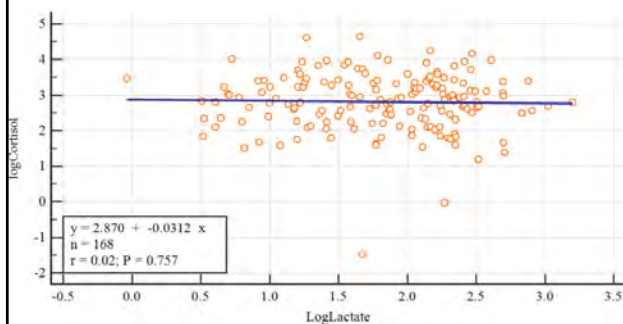


- 168 calves
  - Control (untreated) group
- Biomarkers measured
  - Haptoglobin
  - Cortisol
  - L- lactate



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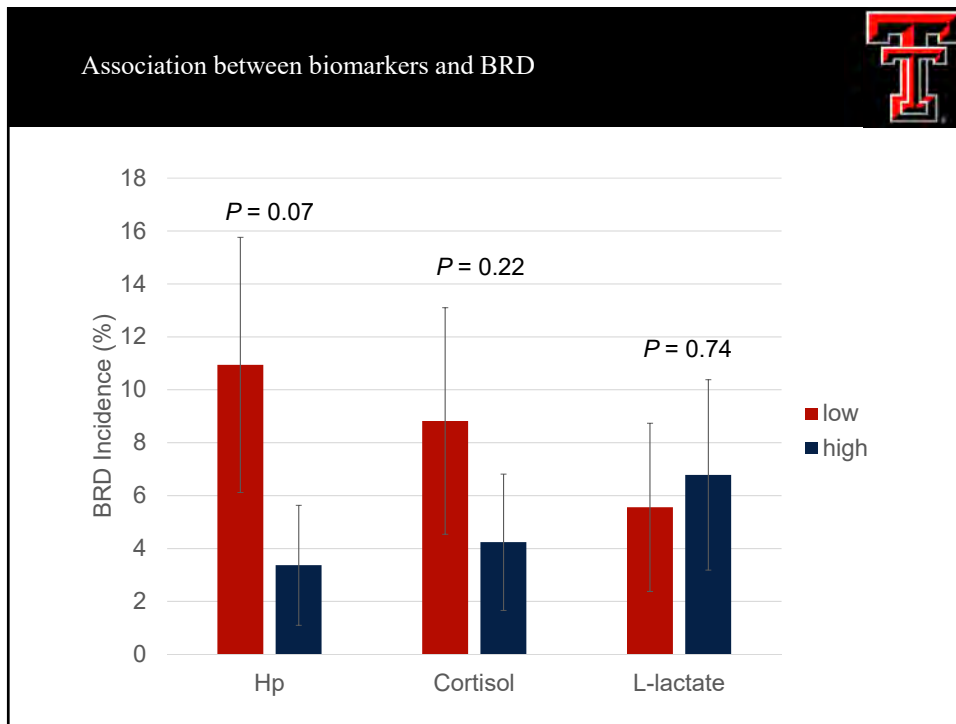
Correlation between biomarkers



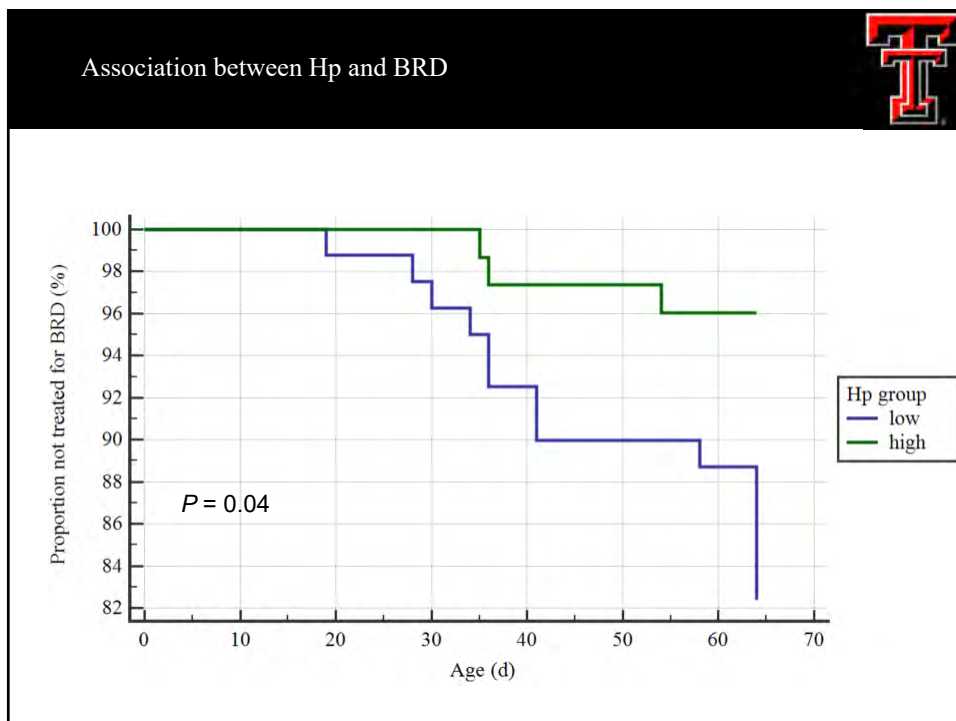
- Haptoglobin
  - 67.9  $\mu\text{g/ml}$
- Cortisol
  - 17.36  $\text{ng/ml}$
- L-lactate
  - 6.5  $\text{mM}$

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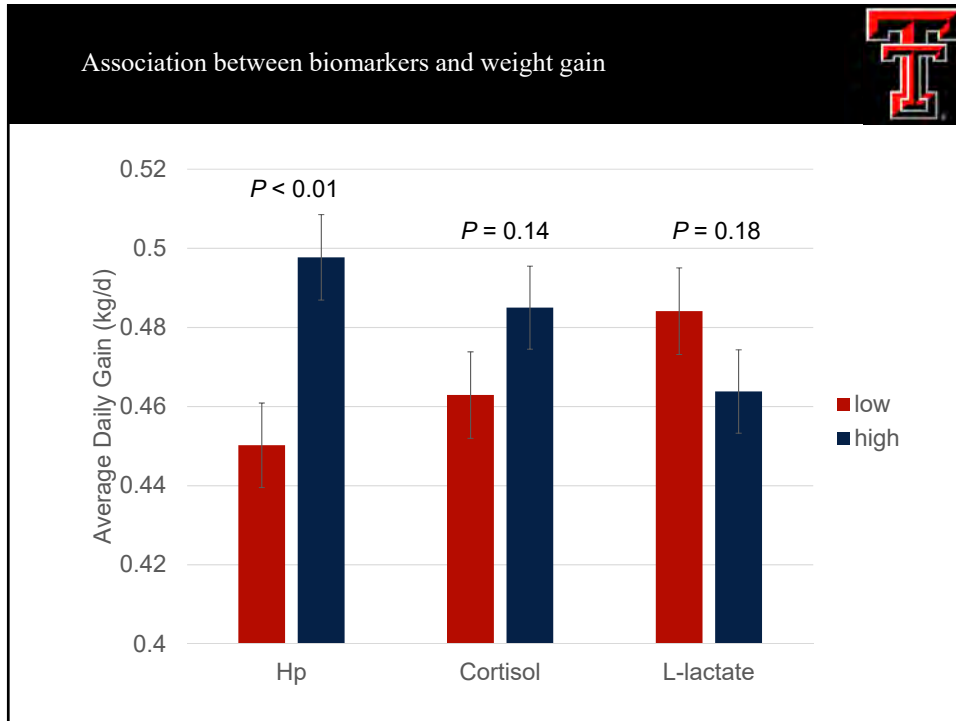




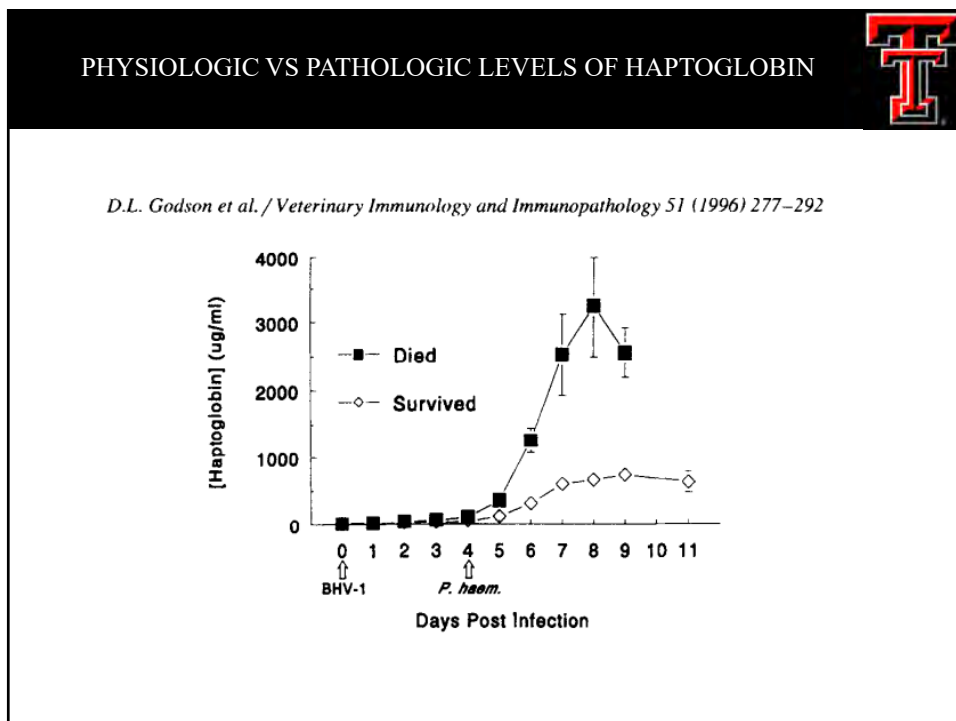
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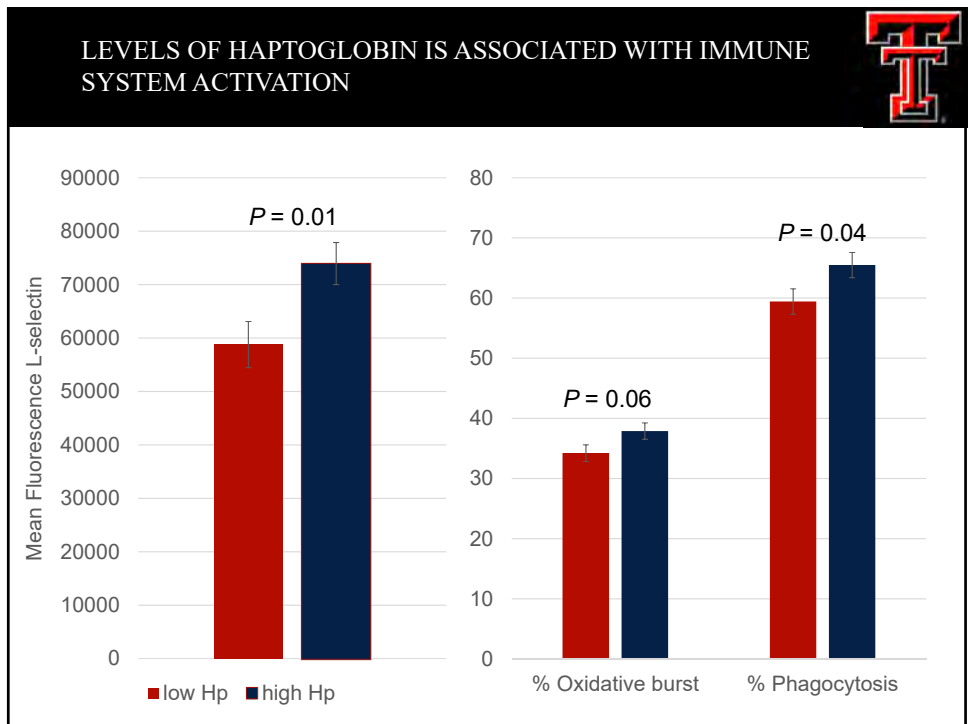
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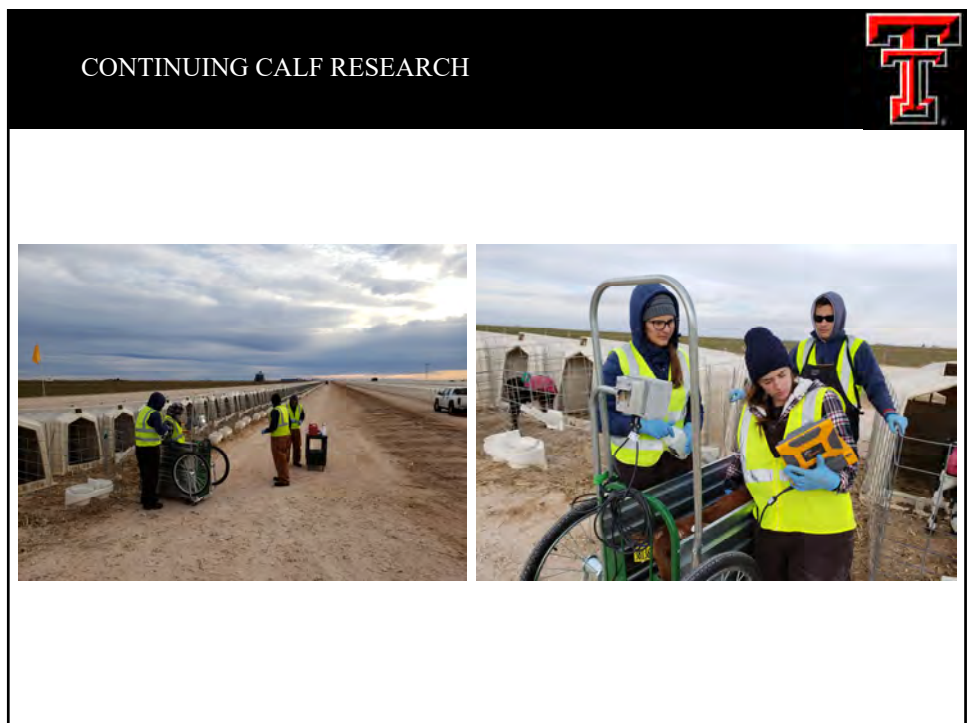
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