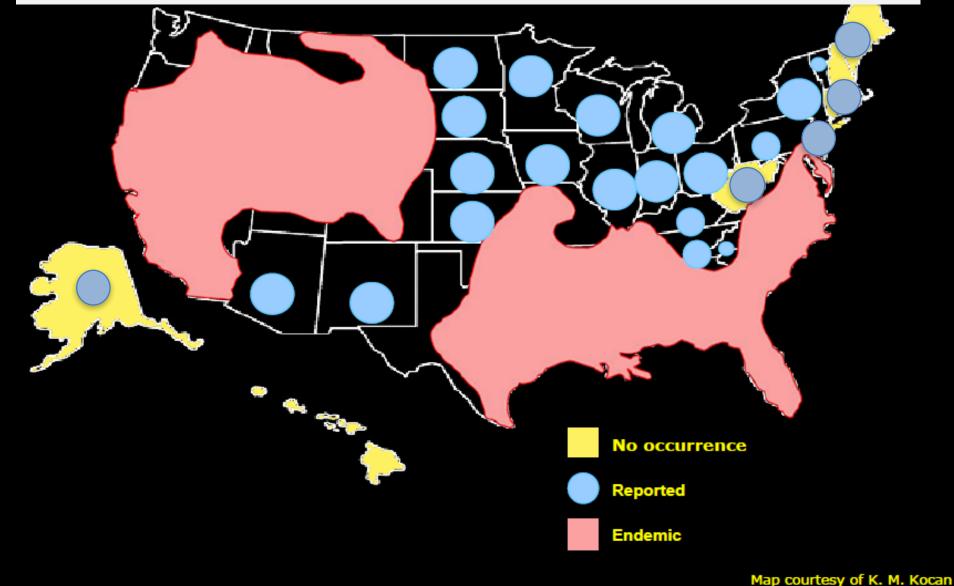
# Anaplasmosis: What it is and what it isn't

Dr. Mike Apley College of Veterinary Medicine Dr. Gregg Hanzlicek Kansas State Veterinary Diagnostic Laboratory

### Anaplasmosis is reported in every state except Hawaii

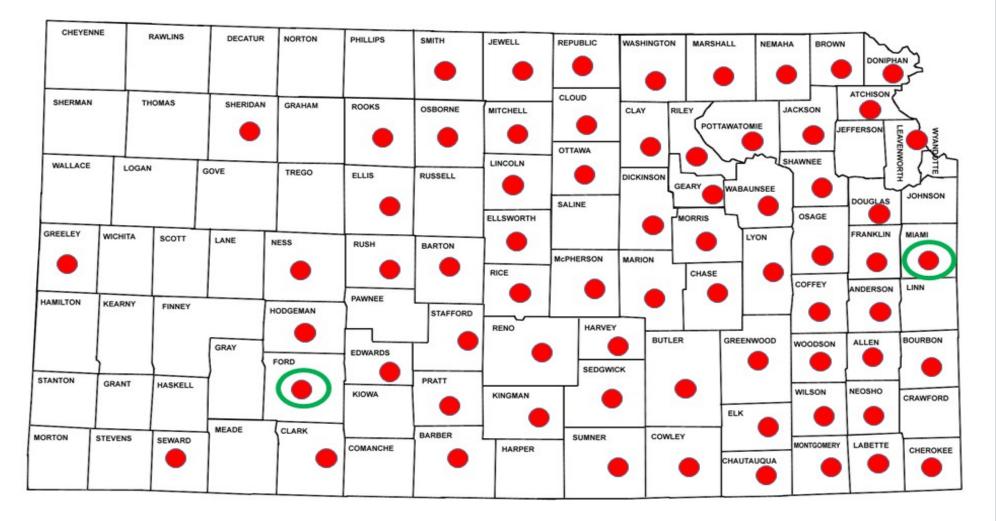


### 2013: Kansas Positive Counties

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WALLACE		LOGAN						LINCOLN	UTTAWA		) ~~~~{	SHAWNEE		
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1									SALINE		WABAUNSEE		DOUGLAS	JOHNSON
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GREELEY	WICH	ITA	SCOTT	LANE	NESS			ι Ι			LYON	1	FRANKLIN	міамі
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MORTON	STEVEN	IS	SEWARD		CLARK	COMANCHE	BARBER		SUMNER	COWLEY		MONTGOMERY	LABETTE	<b>\</b>
						COMANCHE		HARPER			CHAUTAUQUA	1		CHEROKEE
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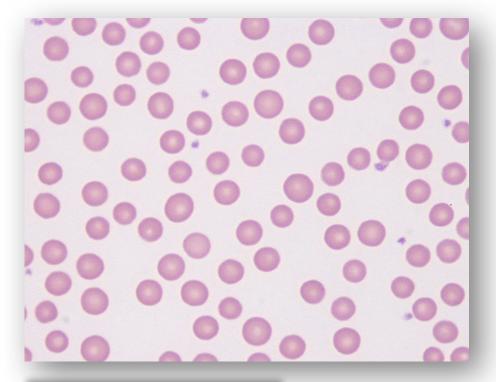
#### **2015:** Kansas Positive Counties

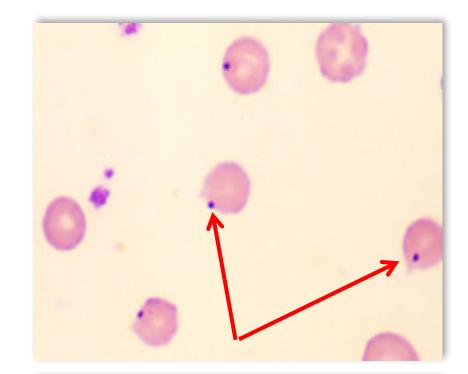


#### www.ksvdl.org "Disease Trend" button

### Anaplasma marginale

### •<u>Rickettsia (gram (–) bacteria</u>) infect red blood cells



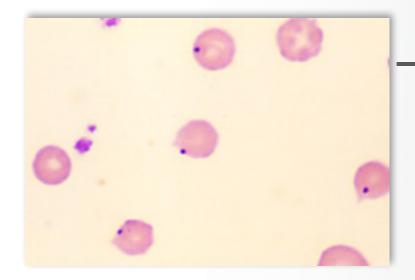


Normal red blood cells

Anaplasma infected red blood cells

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### Red blood cell destruction



#### Animal becomes infected

Spleen removes Anaplasma infected red blood cells Anemic **Clinical signs** 

# Clinical signs only in Adults >2 years age

### Time from infection to clinical signs (prepatent period) 6-70 days Average 28 days

Kocan; 2003, Audry; 2011



# **Clinical signs**

- Adult cows/bulls found dead in the pasture/calving
- Lethargy
- Difficulty breathing (especially when moved)
- Aggressive behavior!!!
- Abortion: KSVDL— 4 herds in spring 2015
- Icterus (yellow membranes)/enlarged spleen

Fever Weight loss Constipation

Radostits, Smith

# How does infection occur?

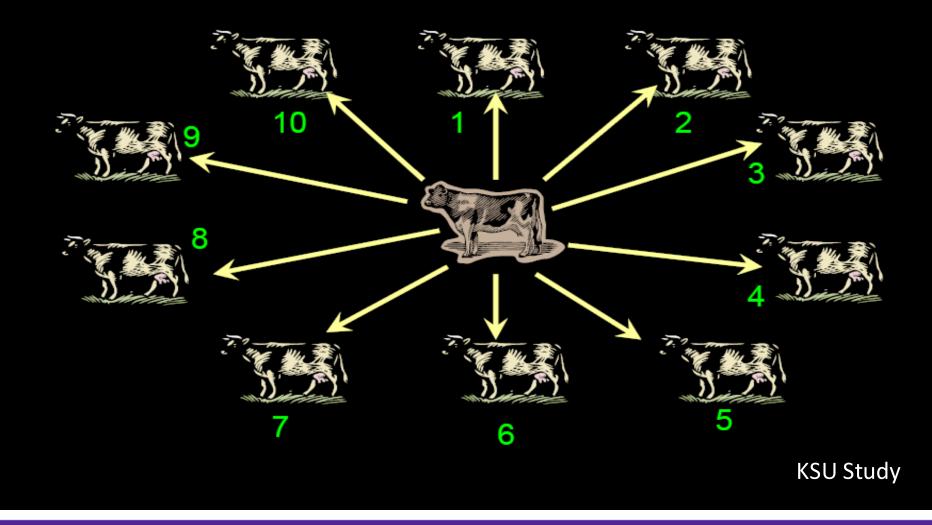
### **Blood transfer**

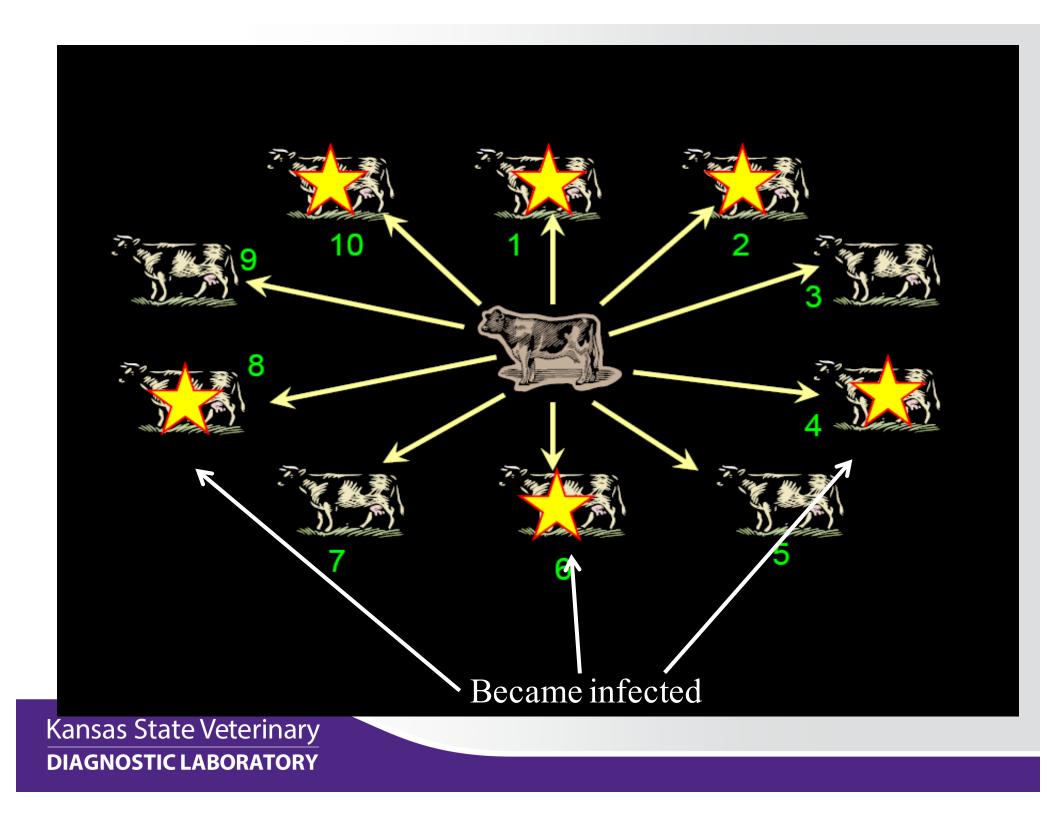
- ✓ Some tick species
- ✓ Some fly species
- During gestation
- ✓ Needles, Tattoo pliers, etc.





Injection sequence using the same needle: Index cow, 2% A. marginale parasitemia





# All ages of cattle can become infected

### Younger animals are more resistant to infection "inverse age immunity"

Kocan; 2003, Aubry; 2011



# <u>All</u> recovered animals will remain lifelong carriers!!!

Kansas State Veterinary DIAGNOSTIC LABORATORY Richey; 1991, Kocan; 2007

# Lifelong carriers <u>will not</u> experience clinical Anaplasmosis in subsequent years

Viseshaual; 2000, Kocan; 2003



# Life-long carriers

# Are the source of infection for other animals, but....

# Difficult to eliminate the carrier state, and.....

# If remove lifelong carrier state: these animals will be

# Susceptible to CLINICAL Anaplasmosis if re-infected in subsequent years

Richey; 1991, Reinbold; 2010, Audry: 2011



## Anaplasmosis is not...

- A bacterial disease.
  - It is a Rickettsial disease in which the pathogen must parasitize red blood cells to survive.
  - This disease has a very narrow choice for therapy
- A uniform disease caused by a consistent parasite.
  - There are different serotypes which originated from different areas of the country.
  - Research tells us that the ability to cause disease and the response to therapy may be quite different for the different serotypes.
- A disease that goes away if the animal survives clinical disease.

## Anaplasmosis is...

- A disease with different clinical outcomes based on the age of cattle infected.
- A disease that can be spread in multiple ways.
  - Ticks are a host where the male tick can be a carrier in which the disease replicates
  - Flies can pass the disease by mechanical means through carrying infected red blood cells between cattle.
  - We can spread the disease through fomites such as injection needles, dehorners, and implant needles.

## Anaplasmosis is...

- A disease for which some of our thinking has been informed by older studies that used relatively insensitive tests.
- A disease with limited data related to the efficacy of treatment and control programs.

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# Thank you

### Icterus



### Icteric eye



Normal eye



### Icteric vulva

