Representative tick borne diseases

- *Cattle tick fever*    Human, cattle, canine
- *Ehrlichiosis*        Human, rodents, carnivores
- *Coxiella burnetii*   Human, rodents, canine
- *RMSF*                Human, canine, small mammals
- *Ehrlichiosis*        Human, canine, deer
- *Q fever*             Human, livestock
- *Lyme disease*        Human, livestock, rodents, birds, cats, dogs
- *Relapsing fever*     Human, rodents, other mammals
- *Tularemia*           Rabbits, rodents, human, livestock, birds
- *Tick paralysis*      Human, livestock
- *Anaplasmosis*        Deer, human, livestock, rodents
- *Heartwater*          Ruminants
- *Borreliosis*         Cattle, dogs, cats
- *African swine fever* Domestic & wild pigs

Colorado Tick Fever
Pathogen: Acute viral infection
Vector: Rocky Mountain wood tick, *D. andersoni*
Transstadial transmission
Reservoirs: Mice, ground squirrels, rabbits
Prevalence: Highest Incidence in Colorado, PIW
Symptoms: Fever, aches, stiffness, nausea

Cattle Tick Fever (Babesiosis)
Pathogen: Protozoan - *Babesia bovis, B. bigemina*
Vector: Cattle tick *Rhipicephalus annulatus*
Southern cattle tick *R. microplus*
Transovarial and transstadial transmission
Disease: Texas fever, red water fever, tick fever
Host: Cattle, dogs (*R. canis*)
Reservoirs: Deer, mice voles
Symptoms: Anemia, wt. loss, dehydration, destroys RBCs, urine red color, lethargic
Prevention aimed at surveillance and control of vector
Tularemia (aka Rabbit Fever)

Pathogen: *Bacterium Francisella tularensis*
2007 outbreak in NW 50

Vector: Rocky Mt. wood tick *D. andersoni* (biological)
Deer flies (mechanical)

Reservoirs: Rodents, rabbits

Hosts: Sheep, horses, humans, birds
human cases associated with sheep industry

Symptoms: Fever, headache, nausea, ulceraed lesions at inoculation site

Anaplasmosis

Pathogen: *Rickettsia Anaplazma marginale*

Vector: *Dermacentor app. main vector in North America*
*D. andersoni, D. variabilis in Montana*
Transstadial transmission
Deer flies (mechanical)

Reservoir: Mule deer, cattle

Host: Cattle, sheep, mule deer
1.2% incidence in cattle in Montana

Symptoms: Fever, labored breathing, jaundice appearance,
Mild strain infected animals recover
Highly virulent 30-50% mortality
Severity increases with age

Rocky Mountain Spotted Fever

Pathogen: *Rickettsia rickettsii*

Vector: *Dermacentor andersoni*, Rocky Mt. wood tick (west)
*D. variabilis*, American dog tick (east)
*Rhipicephalus congoensis*, brown dog tick (AZ)

Disease: Rocky Mountain spotted fever

Host: Humans, dogs, cats

Reservoir: Rodents, ground squirrels, dogs, humans

Symptoms: Sudden onset fever, headache, joint and muscle pain, rash (feet, hands)
RMSF History

- Late 1800's settlers plagued with disease in Bitterroot Valley
- Caused severe dark rash, fever, joint pain, death
- Occurred during spring snow melt
- 1901 MT State Board of Health created
- 1st priority to investigate disease
- H. Nickets determined tick transmitted disease
- 1909 isolated pathogen named in his honor
- C. Birdsall investigated RMSF life cycle
- R.A. Conley developed tick eradication program
- 1929's Spencer and Parker began working on a vaccine
- 1926 state legislature provided $5 to build entomology lab
- 1938 building completed – Rocky Mountain Tick Lab

Cattle Dip Vats

Rocky Mountain Spotted Fever

- Most cases from south Atlantic region (50%)
- North Carolina and Oklahoma highest incidence (35%)
- Western US 3% of cases
- Transmission April - September
Rocky Mountain Spotted Fever

- Dermacentor ticks acquire from rodents, small mammals
- Transovarial and transstadial transmission
- 1 to 3% adult ticks infected in most foci
- Ticks must remain attached 5 – 20 hours

1. Higher tick densities
2. More human activity in tick habitat
3. Increased awareness and reporting
**Lyme Disease**

**Pathogen:** *Borrelia burgdorferi* (bacterial spirochete)

**Vector:** *Ixodes scapularis* blacklegged tick (east)  
(formerly *I. dammini*, deer tick)  
*I. pacificus* Pacific blacklegged tick (west)

**Host:** Humans, canines, cats

**Symptoms:** "Flu-like" symptoms, skin rash, neurologic or arthritic conditions (locale in joints, CNS)

**Cases:** 248,093 human cases 2003 – 2012  
Montana 32 confirmed cases

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* Western black-legged ticks on a finger. Left to right: nymph, adult male, adult female.  
  Source: California Department of Health Services.

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*Established* and *reported* distribution of the Lyme disease vectors *Ixodes scapularis* (eastern blacklegged tick) and *Ixodes pacificus*, by county, United States, 1997–1999.*
Symptoms - humans

- The first sign of infection is usually a circular rash called erythema migrans or EM
- 70 – 80% of infected persons, 1 to 4 wks after tick bite
- Center has a bull’s eye appearance

Treatment

Humans
- Antibiotics give rapid and complete recovery used in early stages (several)
- Vaccine no longer available (2002)
- Complications if left untreated

Canines
- Antibiotics (doxycycline, amoxicillin, tetracycline)
- Vaccine - potential side effects
Prevention and Control

- Clothing – light colors
- Repellents - DEET
- Permethrin-impregnated clothing
- Check Your Skin and Clothes for Ticks Every Day!

http://www.cdc.gov/lyme/

Animal Treatments

- Spot-ons (Frontline)
- Plastic collars (amitraz)
- Self-treatment devices for wildlife

Tick removal

Don't use petroleum jelly, a hot match, or nail polish to remove ticks