

Mariposa County Workshop - Challenges for Rangeland Management, Invasive Weeds & Livestock Diseases

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Requested Topics

BSE, Bovine TB, FMD, EHV-1, Raw Milk Issues, Pest Related Diseases



BSE (“Mad Cow Disease”)

- One of many TSE’s (Transmissible Spongiform Encephalopathies)
 - Related to Kuru, a disease in humans due to cannibalism
 - Typical BSE in cows also related to cannibalism
 - Ruminant meat and bone meal included in rations
 - Big problem in Great Britain, resulted in new variant CJD* in people
 - Inclusion of ruminant protein in ruminant diets is now illegal in US.
 - Case in CA was “atypical” meaning a point mutation in an aged cow, not related to feed, though we treated it as “typical”.
 - If I live long enough, they’ll find TSE’s in my brain too

Bovine TB

- A biblical disease along with leprosy, will be around for a long time to come
- Continuously monitored
 - Slaughter surveillance
 - Herd testing by private veterinarians with follow up on suspects found with caudal fold test
- Seems to be predominantly imported from Mexico
 - At least in California
 - Though not proven, some of these cases may be human to bovine transmission
 - Same genotype found in people in central Mexico

California TB update

- 3 infected dairy herds
- April 2011, 1 herd detected by slaughter surveillance
 - 7 cows subsequently confirmed to be positive
 - Traces to 12 more herds, >350 suspects necropsied, all found to be negative
- October 2011, another herd found to be confirmed positive by slaughter surveillance
 - This herd was depopulated 2-3 weeks ago
 - So far, 58 animals found to be positive
- December 2011, found 3rd positive herd traced from Oct positive herd, with same genotype
 - One positive cow so far.
 - Epidemiology and testing continues.

FMD (Foot and Mouth Disease)

- Most contagious disease in the world
- Experience in Great Britain
 - Strict “Stamping Out” policy
 - Severe economic penalties for countries that have it
 - Severe psychological problem for affected farming families as well as financial ruin
 - Affected entire economy, esp tourism, due to quarantine of trails and entire areas.

FMD (Foot and Mouth Disease)

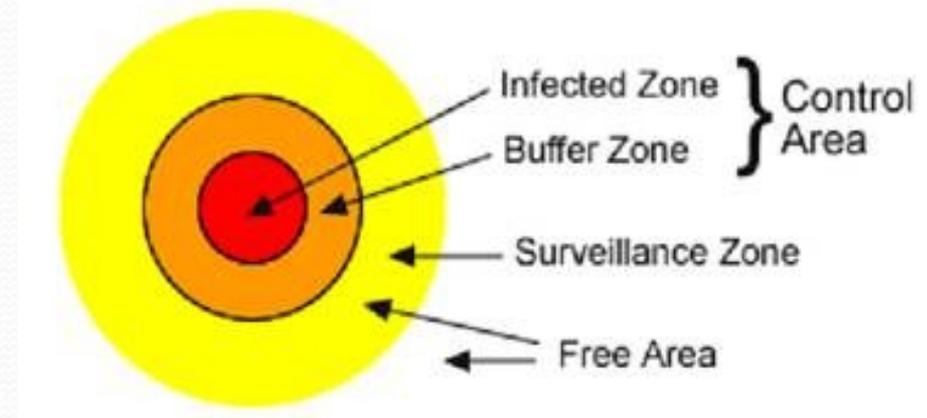
California FMD Outbreaks	1924	1929
Cattle Herds Affected	948	5
Number Cattle destroyed	58,807	277
Number Sheep destroyed	23,328	0
Number Swine destroyed	21,194	3,271
Number Goats destroyed	1,472	23
Wild Deer destroyed	22,214	0
Total Animals destroyed	109,855	3,591
Appraised Value*	\$4,350,000	\$108,000
Days before Diagnosis	63	3
Days before Emer. Declared	90	10
* in Nominal dollars		

FMD (Foot and Mouth Disease)

- Major factors contributing to rapid containment of FMD
 - Rapid detection and diagnosis
 - As shown on the previous slide
 - Rapid response
 - Quarantine of affected premises
 - Control movement of animals, people, materials
 - Vaccination?
 - Problem with vaccination plan is length of time to acquire sufficient number of doses of the correct type*
 - More than one strain of FMD virus, and not cross-protective

FMD (Foot and Mouth Disease)

- Example of areas defined
 - Infected zone ~5 Km radius from infected premises
 - Buffer zone ~10 Km radius from infected premises
- Where do you start vaccinating if decide to vaccinate?



FMD in Great Britain

My experiences

Clinical Signs, Drooling



Tongue ulceration, ~ 48hr lesion



Deer: Wildlife issues



Pastoral scene: what's missing?







Attempts to limit spread



How did FMD get so far advanced?

- Started with pigs fed foreign uncooked garbage
 - High virus concentration
- Proximity of pigs to sale yard
 - Just before a major ram sale
 - Owner of pigs worked at sale yard
- Cold, damp time of year
 - Increased survivability of virus
- Slow recognition and diagnosis
- Inadequate and slow initial response

Risks associated with “garbage feeding”
Foot and Mouth Disease
“An Emerging Threat”



“Garbage feeding” pigs

- Why is this important?
 - Pigs are a multiplier of the virus
 - Shed much more virus into the environment than do cattle, sheep or goats
 - Pigs are omnivores
 - At risk from any product of animal origin that has not been treated to kill the virus
 - Must cook garbage to boiling, and hold at that temperature for 2 hours.
 - Meat products from endemic countries are especially risky.

EHV-1

- Endemic viral disease
 - Primarily upper respiratory disease
 - Can cause abortions
 - Rarely a neurological disease
- No vaccine labeled for prevention of neurologic form
- Neurologic form a reportable disease

EHV-1, (Equine Myeloneuritis)

- Clinical Signs (many cases show none)
 - Fever (>102 deg F)
 - Depression, poor appetite
 - Proprioceptive deficits
 - Poor tail tone
 - Falling down
 - Down and can't get up
- Diagnosis
 - Requires laboratory support
- Treatment
 - Supportive care
- Prognosis
 - Grave if horse is down

Raw milk issues

- Many diseases can be transmitted by raw milk
 - Brucellosis (Undulant Fever in Humans)
 - Tuberculosis
 - Campylobacteriosis
 - Listeriosis
 - Salmonellosis
 - Colibacillosis
- Pasteurization prevents

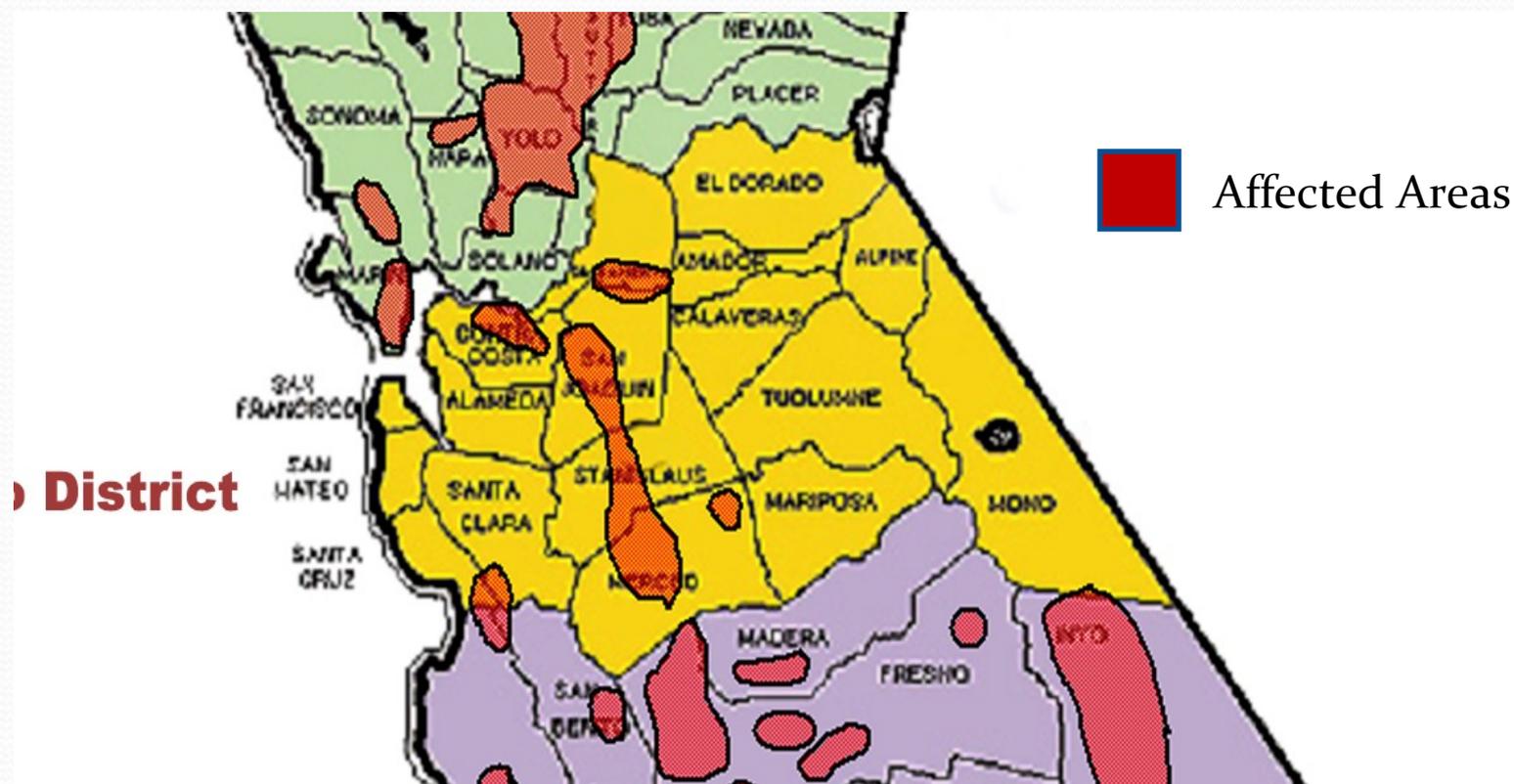
Raw Milk Issues, cont

- Animal Health requirements
 - Annual Brucellosis testing
 - Annual TB testing
 - Assist with disease investigations
- Milk and Dairy Foods
 - Primary branch with responsibility
 - For further questions, contact Milk and Dairy Foods Branch
 - California Department of Food and Agriculture
Animal Health and Food Safety Services, Milk and Dairy Food
Safety Branch
1220 N Street
Sacramento, California 95814
Telephone: (916) 900-5008
Fax: (916) 900-5337
or send an email to: Milk and Dairy Food Safety@cdfa.ca.gov

Other Diseases of Importance

- Anthrax
 - Several historic areas in Central California affected
 - Control / Prevention
 - Know your pasture's history
 - Assess pasture risk based on weather, height of forage
 - Vaccination
 - Must differentiate from other sudden death syndromes
 - Blackleg
 - Redwater

Historic Anthrax areas in the Modesto District



Diseases with Pest Vectors

Vectors of Disease

- Human beings are worst vector of all as far as diseases of animal agriculture is concerned
 - Importance of biosecurity and movement control
- Insects and Arachnids
 - Mosquitos
 - Flies
 - Ticks
- Rodents and other mammals
- Birds
- Mollusks

Diseases transmitted by pests

(a partial list)

- Insects and Arachnids
 - Mosquitos
 - WEE, EEE, VEE, WNV
 - Fleas
 - Plague
 - Gnats, Midges
 - VSV, Bluetongue, EHD in deer, African Horse Sickness
 - Ticks
 - Lyme Disease
 - Anaplasmosis, Piroplasmosis, African Swine Fever, Heartwater Disease
 - Flies
 - Screwworms
 - SE in eggs
 - “Pigeon fever” in horses

Diseases transmitted by pests

(a partial list, cont)

- Rodents

- SE in shell eggs
- Hanta Virus
- Plague (via fleas)

- Humans

- Tuberculosis
- Brucellosis
- AI, END, Mycoplasmosis
- FMD
- Bad Management
- And So On and So On, ad infinitum

Vector borne diseases, Mosquitoes

- WNV, WEE, EEE, VEE
 - Birds are primary host
 - Develop high enough viremia to transmit to mosquitoes
 - Infected mosquitoes transmit to horses and people
 - Horses a “dead end” host except for VEE
 - Viremia too low to transmit
 - Sentinels
 - Vaccine is best protection
 - Mosquito control imperative
 - WNV can cause severe disease in people

Vector borne diseases, fleas

- Plague
 - Endemic in Sierra foothills as shown by surveillance of coyotes.
 - Chipmunks, squirrels appear to be primary hosts
 - Fleas that feed on these rodents in their burrows are primary vector.
 - Same scenario as the “Black Death” outbreaks in medieval Europe
 - May result in closure of parks, etc.
 - Pets (cats and dogs) can also become infected and be a risk for the household.

Vector borne diseases, midges

- VSV, Bluetongue, EHD in deer, African Horse Sickness
 - Vectors are primarily *Culicoides* sp . midges
 - VSV affects cattle, sheep, goats, pigs, and horses
 - Clinically indistinguishable from Foot and Mouth Disease
 - Foot and Mouth does not infect horses
 - Bluetongue is rare in this area, but can affect sheep and goats where it can be confused with orf (soremouth)
 - Can have serious consequences
 - EHD (epizootic hemorrhagic disease) in deer closely related to bluetongue

Vector borne diseases, ticks

- “Texas” Tick Fever, Anaplasmosis, Piroplasmosis, African Swine Fever, Heartwater Disease
 - All tick transmitted
 - All are reportable diseases



Vector borne diseases, flies

Screw Worms

Different than other blow fly maggots

Will eat into living tissue

USDA program has been very successful in eradicating

Danger is in importation from endemic countries.

An imported dog was found to be infested just a few years ago.



Vector borne diseases, flies

- “Pigeon Fever”
- Caused by *Corynebacterium pseudoTB*
 - Has a lipid capsule
- Usually occurs in fall
- Biting flies primary vector
 - Look for spot on belly
- Antibiotics usually not indicated



Vector borne diseases, rodents

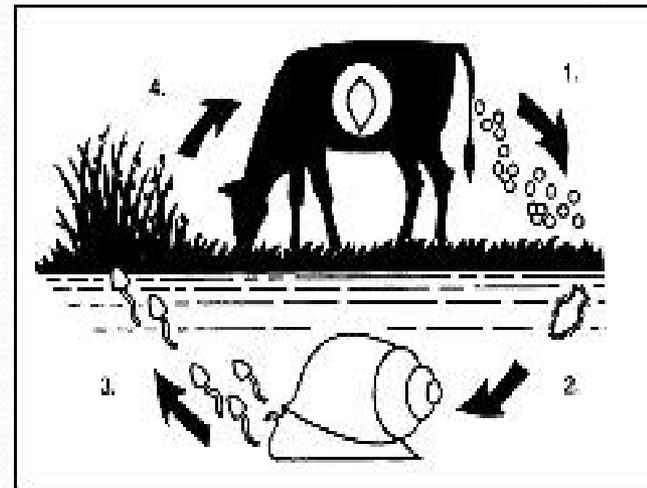
- Hanta virus (sin nombre)
 - Virus in feces and urine
 - Major danger in line shacks, cabins, bunkhouses
 - May be vacant during winter, and house mice
 - “Spring cleaning” is major source of exposure
 - Inhaling dust contaminated with virus
 - Dampen first to decrease dust
 - Wear a mask
 - Mortality rate is high

Vector borne diseases, rodents

- SE in shell eggs
 - Direct correlation between rodent numbers and incidence of SE infected hens.
 - Persistent reservoir for SE in affected houses
 - Causes requirement for sequential cleaning and disinfection
 - Increases cost of doing business
 - Human health risk for food borne illness
 - CEQAP program has so far been successful in prevention
 - New FDA egg safety rule
 - Enforces rodent control as well as other procedures

Vector borne diseases, Mollusks

- Liver flukes
 - Snail is intermediate host
 - Common in CA
 - Treatment / prevention
 - Prevent access to snail infested watering holes
 - Strategic use of drugs
 - Ivermectin plus
 - Commonly implicated in Redwater Disease



Vector borne diseases, other mammals

- Opossum
 - Equine protozoal myeloencephalitis
 - Opossum is definitive host
 - Intermediate hosts are horses, raccoons, cats, skunks



Questions?

