

A Neighborhood Outbreak of Q Fever Linked to A Goat Ranch in California

**Michele T. Jay, DVM, MPVM, DACVPM
Veterinary Public Health Section
Disease Investigations and Surveillance Branch
Division of Communicable Disease Control
California Department of Health Services
Sacramento, California USA**

ACKNOWLEDGMENT



Calaveras County

Rose Cardenas

Jeanie Douglas

Dean Kelaita

CA Dept of Health

Mike Ascher

Kris Carter

David Cottam

Michele Jay

Ben Sun

Duc Vugia

Cal-EIS Program

Tim Wilson

CDC

Jennifer McQuiston

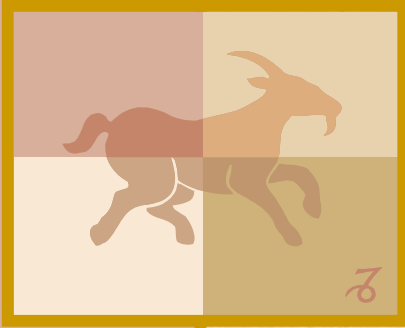
Jeffrey D. Miller

Herbert Thompson

Private Physicians

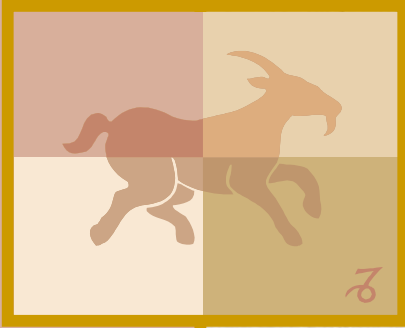
George Rishwain

Edward Schneider



CASE #1: CLINICAL HISTORY

- ❖ A 56-year-old woman is hospitalized in May 2001
 - Insidious febrile illness x 1 month
 - Fever up to 104°F
 - Gall bladder removal without resolution of symptoms
 - Left leg paresthesia and progressive weakness leading to paralysis (unable to walk independently for 1 month)



CASE #1: LAB RESULTS

WBC = 6,500

Platelets= 111,000

AST= 178

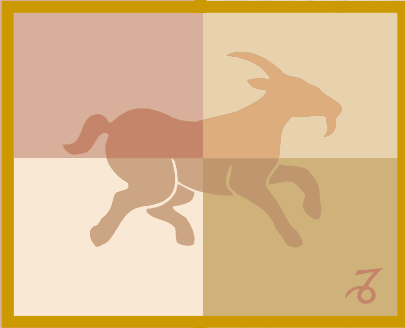
ALT= 149

Alk phos= 532

T. bili= 1.2

Chest (CT): interstitial lung
infiltrates, r. axillary adenopathy

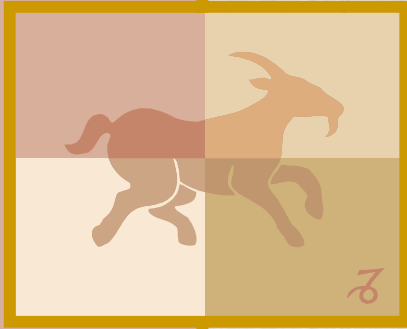
Liver Imaging (CT): hepatomegaly



CASE #1: Q FEVER SEROLOGY

	IFA		CF		
	6/11	7/31	6/11	7/31	10/12
Phase I IgG	<64	64			
Phase II IgG	≥1024	≥1024	512	128	64
IgM	≥40	≥40			

IFA = indirect immunofluorescence test
CF = complement fixation test



CASE #1: EXPOSURE HISTORY

- ❖ During 6 months prior to illness onset, the patient reported:
 - No direct contact with domestic animals or wildlife
 - No consumption of raw dairy products
 - No tick or other arthropod bites
 - No travel history outside of Calaveras County



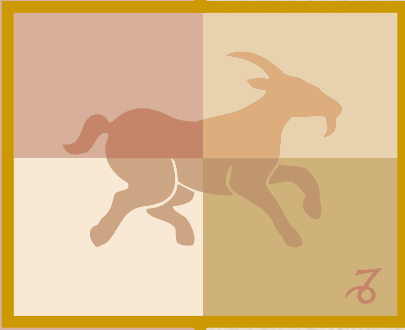
❖ Patient is a resident of a rural town in the Sierra Nevada foothills, Calaveras County, California



*The Celebrated
Jumping Frog
of Calaveras County*



By Mark Twain



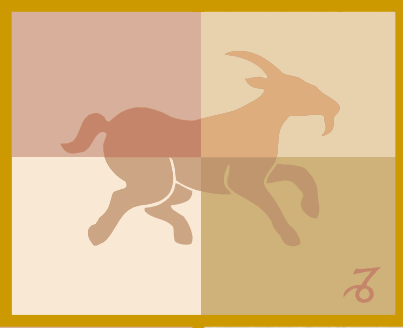
CASE #1: EXPOSURE HISTORY

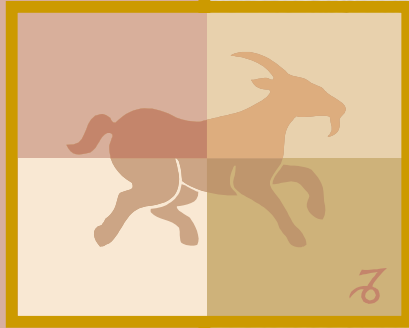


- ❖ Patient lives at the end of a dusty dirt road ¼ mile from a small herd of about 50 goats
- ❖ Goats recently kidded in Mar-Apr 2001
- ❖ Pasture fencing alongside dirt road (first property on the road road)
- ❖ Goats present for ~1 year

CASE FINDING

- ❖ Interview with the patient revealed that her husband (Case #2) also had a mild febrile illness in May
- ❖ Canvassing of the neighborhood by the local public health nurse revealed a 76 year old man (Case #3) with an intermittent febrile illness since April
- ❖ Press release issued to local news and an alert to local health care providers; no additional cases identified

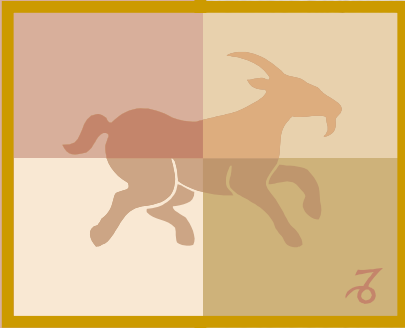




Q FEVER SEROLOGY

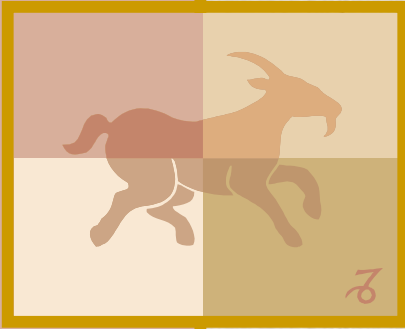
	CASE #2		CASE #3	
	6/27	7/31	8/27	10/9
IFA Phase I IgG	≥1024	≥1024	1024	1024
IFA Phase II IgG (CF)	≥1024	≥1024 (128)	4096 (256)	4096 (256)
IFA IgM	≥40	≥40	≥160	

IFA = indirect immunofluorescence test



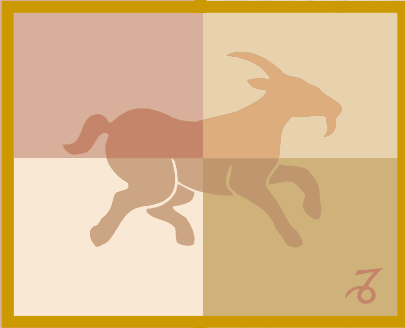
TREATMENT AND FOLLOW-UP

- ❖ All 3 case-patients treated successfully with oral doxycycline
- ❖ Case #1 continues to have residual weakness and pain in the left leg; her neurologist feels that the damage is permanent
- ❖ Serologic monitoring of CF titers is being done by the CA Dept of Health Services every 4-6 months to detect chronic Q fever



ENVIRONMENTAL INVESTIGATION

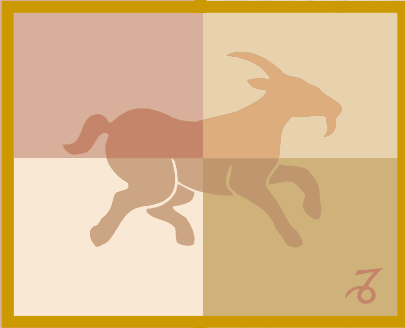
- ❖ Owner of the goat ranch notified about the Q fever cases in the neighborhood
- ❖ No similar illness among family members or caretakers at the ranch
- ❖ Goats appear healthy; no history of reproductive problems
- ❖ Herd is noncommercial, mixed breeding, primarily kept as a hobby
- ❖ Placentas and other birthing products left in pasture or “thrown to the eagles”



ENVIRONMENTAL INVESTIGATION

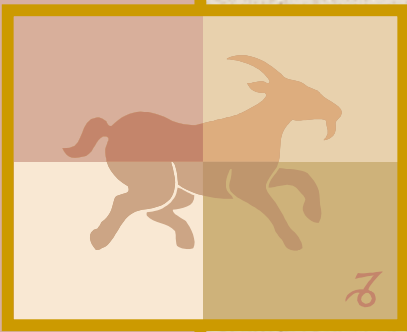
- ❖ A serosurvey of the goat herd revealed a high prevalence of antibodies to *C. burnetii*





ENVIRONMENTAL INVESTIGATION





ENVIRONMENTAL INVESTIGATION



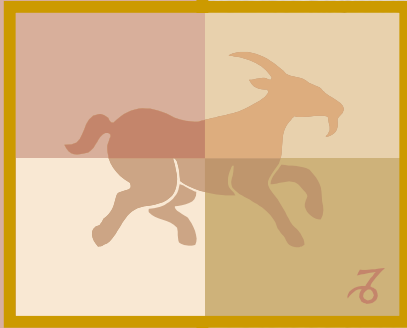
Goat Serosurvey

42/46 (91%) seropositive by
IFA testing

- 38/40 (95%) females
- 4/6 (67%) males

SUMMARY

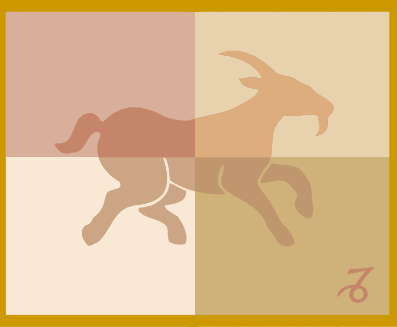
- ❖ Cases most likely exposed to Q fever indirectly by inhalation of aerosolized contaminated dust particles spread downwind or while driving past the goat herd
- ❖ Recommendations were given to the ranch owner to minimize environmental contamination during future birthing seasons





SUMMARY

- ❖ This outbreak illustrates the potential for patients infected with Q fever to present without a history of direct contact with animal reservoirs
- ❖ Thorough public health investigation is necessary to identify potential clusters and common sources; implications for bioterrorism surveillance



SUMMARY



- ❖ Both rural and urban populations are at risk of exposure to Q fever in California, where “hobby” goat herds and petting farms are increasingly popular