



# California Animal Health & Food Safety Laboratory System

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**Preliminary**  
**Version 2**

**CAHFS Case #:** D0712007  
**Referral #:**  
**Case Coordinator:** Barr, Bradd  
**Date Received:** 10/14/2007  
**Date Collected:**

Preliminary report sent by: Barr, Bradd on 10/19/2007 12:48:39PM

This report supersedes all previous reports for this Case.

Fax To:  
209-928-1177

### Contacts:

Role	Full Name	Phone	Address
Bill To	ANIMAL MEDICAL CLINIC	209-532-5529	19624 HWY 108 SONORA, CA 95370
Submitter	POLLARD, ROBERT J	209-532-5529	19624 HIGHWAY 108 SONORA, CA 95370
Owner	ALLISON MOSS FRITCH	408-202-3346	C/O CAMANCHE RANCH ALPACAS 4198 CAMANCHE RD IONE, CA 95640

### Collection Site:

IONE, CA 95640

**Specimens Received:** 1, Carcass;

### Specimen Details:

ID	ID Type	Taxonomy	Gender	Age
Tally Pearl	Name	Alpaca	Female	

## Laboratory Findings/Diagnosis

1. Marked serofibrinous pleuritis.
2. Acute severe interstitial pneumonia with hyaline membrane formation. Etiology: Suspect viral.
3. Mild serofibrinous peritonitis (gross observation only).
4. Mild acute multifocal pleocellular gastritis, nonglandular mucosa of the first stomach compartment.
5. Miscellaneous findings:
  - A. Very mild nephrocalcinosis.

## Case Summary

10/18/07:

The significant findings were limited largely to the lungs and thorax as indicated previously. The histologic changes are compatible with a very acute diffuse interstitial pneumonia resulting in loss of integrity of either the alveolar capillary or epithelial cell lining resulting in exudation of fibrin accompanying edema fluid through the alveolar septa into the lumen. There is also evidence of epithelial regeneration which appears to be most prominent in alveolar epithelium and terminal airways. There is very little appreciable inflammation associated with this apparent epithelial necrosis and exudation. As mentioned previously toxic or viral insults are possible causes, but given the apparent outbreak of this similar pattern of this respiratory disease within the local area I suspect a viral insult. We are doing tests for various viruses amongst other common domestic livestock species to try and rule out various possible causes, but to date the tests have been uniformly negative. Serology is positive for antibodies to Blue Tongue virus but this is not unexpected as the virus is so common in this region. I therefore strongly believe this positive serology is meaningless (has not been positive in all cases to date) but we are including screening for Blue Tongue virus among a range of other viruses. Cultures are also negative aside from a strep species which is considered to be a secondary opportunist. In summary then I suspect an acute viral pneumonia is responsible for death. We will continue to try and see if we can identify a possible etiologic agent.

10/16/07:

Cultures are still pending but aerobic cultures appear to be negative to this point and the lesions would make a bacterial cause less likely unless it was an odd organism such as Mycoplasma or Chlamydia. Tests for both are pending. We have seen a rash of similar cases suggesting this a contagious disease which favors a viral insult.

10/14/07:

The striking findings are listed above. There was a large amount of serous fluid with free fibrin in the thoracic cavity and the lungs appeared somewhat collapsed. Grossly the lungs were deep red and had a heavy wet texture. I have only briefly examined them

microscopically but there is a definite acute interstitial pneumonia with scattered fibrin hyaline membranes pasted along alveolar surfaces. There is no appreciable inflammatory cell infiltrates but some evidence of alveolar and small airway epithelial cell regeneration. I have no idea as to the cause. Both acute viral and toxic insults are possible although given the history and limited number odd toxic insults that would cause this lesion (it is identical to 3 methyl indole poisoning or "Fog Fever" from ingestion of lush green fast growing pasture grass), I would first consider a viral insult. We ran FA for several viral diseases of cattle and horses (see below) but these are negative. A very mild, but similar pattern of serofibrinous fluid was found in the abdominal cavity. Death is attributed to the flooding of the lungs. Additional tests are pending and an updated report will follow.

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### Clinical History

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Duration of illness: 1-2 days

Had snuffles 1-2 days, bit at feeder last night.

Treatments: None.

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### Gross Observations

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A single adult alpaca, female, weighing 157- pounds is submitted. The animal is unremarkable externally. It's in relatively good nutritional condition and postmortem condition with moderate-size fat depots in the thorax and abdomen. There is a large amount of clear straw-colored serous fluid in the thorax with a large free clot of fibrin located in the dorsal aspect of the caudal thorax. There is a single firm fibrous adhesion between the anterior portion of the right apical lung lobe and adjacent parietal pleura. The entire right and left lung appear slightly collapsed and are deep dark red in color with a heavy wet rubbery to slightly firm fleshy texture, it is very uniform throughout. The mainstem bronchus and trachea are relatively unremarkable aside from small amounts of frothy fluid and frothy fluid oozes from the cut parenchymal surface of the lungs. There is no visible thymus in the anterior mediastinum. The heart is unremarkable.

There is a slight excess of a red-tinged serous fluid in the abdominal cavity with infrequent loose strands of fibrin on the serosa and surface of the omentum. The uterus is gravid containing a single male cria which has a 44 cm crown-rump length. There is no hair on the body. The fetus is good postmortem condition. The placenta has partially separated from the uterine mucosa, but the uterus and fetal fluids and placenta are otherwise grossly unremarkable. There are essentially no significant gross findings noted in the thorax or abdomen of the fetus other than the presence of infrequent petechiae on the pleural surface of the lungs.

The bladder is empty with a light pink mucosa. Both kidneys are dark red-brown in color with a smooth capsular surface and are unremarkable on cut surface. The spleen is unremarkable with a dark red-brown color and soft pulpy texture. The liver also is unremarkable with a red-brown color, a smooth capsular surface, and normal texture. The single adrenal gland examined is unremarkable. Mesenteric lymph nodes are extremely small in size and difficult to locate. The first stomach compartment contains a moderate amount of fine, fibrous, green forage and fluid. There is a single focus on the non-glandular mucosa just anterior to the saccules in the ventral floor which has a pale tan-green color and is rimmed by a thin band of hyperemic wall. This focus is approximately 4-6 cm. in diameter. There are adjacent areas of the non-glandular mucosa which have a brown color as compared with the remainder of the mucosa which is a light tan-brown to tan-green in color. The second stomach compartment is unremarkable. The third stomach compartment contains a large soft formed bolus of fine granular green feed material. The glandular portion is congested, but otherwise unremarkable. There appear to be some firm fibrous adhesions between the anterior duodenum and the caudal portion of the first stomach although there are no other abnormalities noted other than this firm adherence of this portion of the duodenum to the stomach. There are segments in the small intestines which are slightly flaccid and a dark red-brown in color with a similar red-brown fluid content (presumptive focal hypostatic congestion). The small intestines are otherwise unremarkable. The cecum contains a modest amount of fine, soft, semi-fluid green feces and there are progressively more formed green feces throughout the spiral colon which is unremarkable with normal appearing firm fecal pellets in the distal colon.

The skull is split in a parasagittal plane with a band saw. The brain is grossly unremarkable. The nasal mucosa is markedly congested, dark red in color. The oral cavity is unremarkable. The select muscles and joints examined as well as the peripheral nerve are unremarkable.

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### Bacteriology

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**BACTERIAL AEROBIC CULTURE**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Lung Tissue	17-Oct-2007	Mixed flora Rare	
Tally Pearl	Tally Pearl	Lung Tissue	17-Oct-2007	Streptococcus sp. alpha-hemolytic Rare	
Tally Pearl	Tally Pearl	Thoracic Swab	17-Oct-2007	No growth after 48 hours	
Tally Pearl	Tally Pearl	Abdominal Swab	17-Oct-2007	No growth after 48 hours	
Tally Pearl	Tally Pearl	Liver Tissue	17-Oct-2007	No growth after 48 hours	
Tally Pearl	Tally Pearl	bronchial Lymph Node Tissue	17-Oct-2007	Mixed flora	
Tally Pearl	Tally Pearl	mandibular Lymph Node Tissue	17-Oct-2007	No growth after 48 hours	

**SALMONELLA CULTURE - MAMMALIAN**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Feces	17-Oct-2007	No Salmonella detected	

**B i o t e c h n o l o g y****BLUETONGUE VIRUS WADDL**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Lung Tissue	Pending		

**BVD QRT PCR**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Spleen Tissue	16-Oct-2007	Negative	

**EQUINE HERPESVIRUS1 QPCR**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Lung Swab	17-Oct-2007	Negative	

**EQUINE NEUROPATHOGENIC HERPESVIRUS**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Lung Swab	17-Oct-2007	Negative	

**INFLUENZA RRT-PCR**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Lung Swab	17-Oct-2007	Negative	

**H i s t o l o g y**

## T30:

Sections of liver, kidney, heart, lung, spleen, lymph node, ovary, uterus, adrenal gland, joint capsule, peripheral nerve, skeletal muscle, multiple sections of gastrointestinal tract, and brain as well as sections of fetal liver, thymus, lung, heart, kidney, and placenta are examined with findings greatly summarized.

The fetal tissues are in good postmortem condition and are essentially unremarkable. There are infrequent foci of hemorrhage in the thymus.

Throughout sections of lung the parenchyma is variably collapsed with marked pulmonary congestion and edema (lacy pink proteinaceous material within alveolar lumen). In addition there are widespread membranous fibrin deposits pasted against the surface of alveoli and alveolar ducts that are compatible with "hyalin membranes". There are very small numbers of isolated free macrophages within alveoli. The epithelium lining terminal airways often is mildly hyperplastic and lined by a somewhat disorganized regenerative single layer of polygonal shaped epithelial cells with enlarged nuclei that have visible nucleoli. In addition there is a similar pattern of markedly hyperplastic alveolar epithelium lining alveoli immediately beneath the pleural surface in select areas of the lung. Rare small focal lymphocytic infiltrates are seen adjacent to large vessels or terminal airways. In addition there are small aggregates of plump dust filled (presumptive silicates) macrophages adjacent to terminal airways. The epithelium lining larger airways has largely undergone postmortem sloughing and loss, but is otherwise unremarkable. Within the pleura there is mild focal expansion of the stroma with occasional dilated lymphatics compatible with edema. In addition there are random infrequent perivascular oriented infiltrates of lymphocytes and dust filled macrophages. Mesothelium lining the pleural surface is very mildly hypertrophied. There also are very infrequent small foci of alveolar hemorrhage. Sections of bronchiolar lymph node are congested and edematous with markedly dilated sinuses and loose stroma in medullary cords as well as around large vessels. There are occasional collections of loose fibrin seen within the sinuses and in adjacent afferent lymphatics. There also are occasional small foci of hemorrhage with small fibrin thrombi seen in select larger vessels. Aside from fibrin and free red cells the sinuses contain a relatively small population of lymphocytes and macrophages. There are also infrequent small collections of dust filled macrophages. The mandibular lymph node also is markedly congested and edematous.

The spleen is moderately congested. In the adrenal gland the cortex appears mildly hypertrophied with swollen cells in the outer half of the cortex that are vacuolated containing fat-like vacuoles. In the thymus there is pronounced atrophy of lymphocytes leaving small shrunken islands of epithelial cells and lymphocytes.

In the stomach compartment there are infrequent discrete small focal infiltrates of neutrophils within the superficial epithelium. Sections of small intestine are autolyzed to a varying degree, but otherwise relatively unremarkable. In one section of apparent cecum there are increased mucosal infiltrates of granulocytes (possible eosinophils) which vary in extent within the lamina propria. The crypts are uniform in density and moderate in height. Sections of apparent spiral colon however are unremarkable. In the liver the parenchyma is congested. Centrilobular hepatocytes contain abundant fine to coarse light brown cytoplasmic granules compatible with secondary lysosomes. The liver is otherwise unremarkable. In the sections of kidney there are scattered basophilic calcium mineral-like deposits seen in the stroma or lumen of collecting ducts within the outer portion of the medulla. Sections of brain are unremarkable.

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**I m m u n o H i s t o C h e m i s t r y**

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**BOVINE CORONAVIRUS IMMUNOHISTOCHEM (IPX)**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Block #T18	Tissue Block	19-Oct-2007	Negative	

**BRSV - IMMUNOPEROXIDASE (IPX)**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Block #T18	Tissue Block	19-Oct-2007	Negative	

**CHLAMYDIA - IMMUNOPEROXIDASE (IPX)**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Block #T18	Tissue Block	19-Oct-2007	Negative	

**EQUINE HERPES VIRUS 1/4 IMMUNOPEROXIDASE-IPX**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Block #T18	Tissue Block	19-Oct-2007	Negative	

**IBR - IMMUNOPEROXIDASE (IPX)**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Block #T18	Tissue Block	Pending		

**MISCELLANEOUS - IMMUNOPEROXIDASE (IPX)**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Block #T18	Tissue Block	19-Oct-2007	Negative	Paramyxovirus group 1 (avian) antibody is viral group specific

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**Immunology**


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**BLUETONGUE VIRUS CELISA (BTV CELISA)**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Blood	18-Oct-2007	Positive	

**BOVINE VIRAL DIARRHEA TYPE I-SVN (BVDV I)**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Blood	Pending		

**BOVINE VIRAL DIARRHEA-TYPE II/BORDER DISEASE SVN**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Blood	Pending		

**EPIZOOTIC HEMORRHAGIC DISEASE VIRUS-AGID (EHD)**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Blood	Pending		

**EQUINE HERPES VIRUS (RHINOPNEUMONITIS EHV-1) (ERP)- SVN**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Blood	Pending		

**PARAINFLUENZA VIRUS 3 - HI (PI3-HI)**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Blood	19-Oct-2007	Negative @1:8	

**Parasitology**

**FECAL EXAM - FLOTATION**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Feces	15-Oct-2007	No parasite eggs detected	

**Toxicology**

**SELENIUM - TISSUE/OTHER**

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
Tally Pearl	Tally Pearl	Liver Tissue	17-Oct-2007	1.06	RL=0.020 ppm

**HEAVY METAL SCREEN**

Animal/Source	Specimen	Specimen Type	Date Tested
Tally Pearl	Tally Pearl	Liver Tissue	17-Oct-2007

Analyte	Result	Units	Rep. Limit	Comments	Reference Range
Arsenic	Not Detected	PPM	1.000		<2.0
Cadmium	Not Detected	ppm	0.300		<1.0
Copper	130	PPM	0.100		25-100
Iron	76	PPM	0.200		70-200
Lead	Not Detected	PPM	1.000		<2.0
Manganese	2	PPM	0.040		2.0-4.0
Mercury	Not Detected	PPM	1.000		<1.0
Molybdenum	Not Detected	PPM	0.400		<1.0
Zinc	30	PPM	0.100		20-90

**Virology**

**BOVINE HERPES VIRUS 1 (IBR) - FA**

<b>Animal/Source</b>	<b>Specimen</b>	<b>Specimen Type</b>	<b>Date Tested</b>	<b>Result</b>	<b>Comments</b>
Tally Pearl	Tally Pearl	Lung Tissue	15-Oct-2007	Negative	

**BOVINE RESPIRATORY SYNCYTIAL VIRUS - FA (BRSV)**

<b>Animal/Source</b>	<b>Specimen</b>	<b>Specimen Type</b>	<b>Date Tested</b>	<b>Result</b>	<b>Comments</b>
Tally Pearl	Tally Pearl	Lung Tissue	15-Oct-2007	Negative	

**DIRECT ELECTRON MICROSCOPY (EM)**

<b>Animal/Source</b>	<b>Specimen</b>	<b>Specimen Type</b>	<b>Date Tested</b>	<b>Result</b>	<b>Comments</b>
Tally Pearl	Tally Pearl	Lung Tissue	17-Oct-2007	Negative	

**EQUINE HERPES VIRUS 1 (RHINOPNEUMONITIS) -FA**

<b>Animal/Source</b>	<b>Specimen</b>	<b>Specimen Type</b>	<b>Date Tested</b>	<b>Result</b>	<b>Comments</b>
Tally Pearl	Tally Pearl	Lung Tissue	15-Oct-2007	Negative	

**VIRUS ISOLATION - MAMMALIAN**

<b>Animal/Source</b>	<b>Specimen</b>	<b>Specimen Type</b>	<b>Date Tested</b>	<b>Result</b>	<b>Comments</b>
Tally Pearl	Tally Pearl	Lung Tissue	Pending		