



California Animal Health & Food Safety Laboratory System

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Preliminary
Version 2

CAHFS Case #: D0712047
Referral #:
Case Coordinator: Barr, Bradd
Date Received: 10/15/2007
Date Collected:

Preliminary report sent by: Barr, Bradd on 10/19/2007 1:55:00PM

This report supersedes all previous reports for this Case.

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Contacts:

Role	Full Name	Phone	Address
Owner	LILLY, NANCY	209-577-3638	2912 CHURCH STREET MODESTO, CA 95357
Submitter	Michelle Ing	916-847-5214	PO Box 2073 6380 Cavitt Stallman GRANITE BAY, CA 95746

Collection Site:

Specimens Received: 1, Carcass; 1, Clotted Blood;

Specimen Details:

ID	ID Type	Taxonomy	Gender	Age
D0712047-01	CAHFS Internal ID	Alpaca	Female	12

Laboratory Findings/Diagnosis

1. Severe hydrothorax.
2. Peracute interstitial pneumonia with severe pulmonary edema, infrequent hyaline membrane formation (fibrin), and bronchiolar epithelial hypertrophy. Etiology: Suspect viral.
3. Mild peracute fibrinous bronchiolar lymphadenitis.
4. Mild hydroabdomen.
5. Dilated right inguinal ring (1.5cm lumen) with cystically dilated subcutaneous inguinal canal.
6. Mild to moderate eosinophilic enterocolitis. Etiology: Possible parasitic (none identified).

Case Summary

10/19/07:

The histologic changes are compatible with a very acute interstitial pneumonia and the pattern is also very similar to the interstitial pneumonia that has been diagnosed within the last week in three additional adult female alpacas. I have no idea as to the cause, but a viral insult is most likely. Reports on the internet suggest this is a widespread problem that has manifested in the last few weeks across the United States. Tissue has been sent to an outside lab to attempt to isolate a virus. We have run a gamut of tests for various viral diseases of other livestock and they are uniformly negative aside from positive blue tongue serology. I suspect this is an incidental finding reflecting subclinical exposure to the Blue Tongue virus which is common in this region. Two of the three alpacas with this particular pneumonia that I have necropsied are seropositive. Therefore this result was not unexpected but to further rule out Blue Tongue, we will try and run PCR or viral isolation to further rule it out. In other words this blue tongue serology was not unexpected and I believe it is not related to the syndrome, but we will pursue it anyway. Additional tests are pending and an updated report will follow.

10/17/07:

The significant findings were the presence of large amounts of serous fluid in the thoracic cavity with smaller amounts of fluid in the abdominal cavity and partially collapsed lungs that were a meaty red in color with a heavy wet to slightly consolidated texture throughout. I have looked quickly at sections of lung and local lymph node and aside from the marked pulmonary congestion and edema there are infrequent hyaline membranes (pasted fibrin membranes against surface of alveoli) but not much else in the way of inflammation. However, the changes fit for the same condition that I have seen in just the past few days in other pregnant alpacas. While the cause is completely unknown, and could include viral, toxic (3 methyl indole, or paraquat, ANTU although a toxic insult seems unlikely given the widespread distribution of this problem, and these toxins are not available or used anymore) or even unusual select bacterial causes (such as occurs on occasion with peracute mycoplasma pneumonia in goats) given the species and the combined histories I am getting from different cases, my best guess still is that this is viral in origin. We are trying to run any and all viral FA IHC and PCR tests we can for known viruses in other livestock species as a quick screening effort but so far all are negative. I expect to send of tissue somewhere for viral isolation but am not sure where the best source for this testing would be at this time. Additional tests including PCR and FA for numerous respiratory viruses and select cultures are pending and an updated report will

follow.

Clinical History

Weight loss during last week. Anorectic, depressed, (third trimester pregnant). No fever or coughing, labored respiration inspiratory/expiratory. Sudden death on this farm 4-6 wks ago "Eudora" Lilly. Accession D0709706.

Treatments: IV antibiotics, supportive care, plasma transfusion, died before bloodwork was completed.

Gross Observations

A single adult female alpaca weighing 152 pounds is submitted. There is an indwelling catheter in the right jugular vein with tape over it. The animal is otherwise unremarkable externally, is in good nutritional and good postmortem condition. The mammary gland is slightly enlarged. There is a collapsed cystic structure which extends from the right inguinal ring into the subcutis of the lower right inguinal region. This cystic structure has a loose edematous consistency and contains a moderate amount of straw-colored serous fluid. The inguinal ring is mildly dilated with an approximately 1.5 cm diameter lumen that is continuous with the abdominal cavity.

There is a large amount of clear straw colored serous fluid in the thoracic cavity. The lungs are partially collapsed and are generally a deep plum red in color with scattered lobules that are partially aerated and lighter pink in color. The lungs have a diffuse heavy wet to meaty texture throughout and the bronchiolar lymph nodes are greatly enlarged with a red-brown color and a very wet appearance on cut surface. There is a small thymus in the anterior mediastinum. There is also an excess of clear serous fluid in the pericardial sac. The left ventricle of the heart appears mildly dilated. The heart is otherwise unremarkable. In the abdominal cavity the liver appears enlarged and is dark brown in color with a smooth capsular surface and normal texture. The spleen is moderate in size and dark blue-red in color with a soft texture. Both kidneys are a congested dark red-brown in color with a smooth capsular surface and are unremarkable on cut surface. The bladder is empty with a light tan-pink mucosa. The uterus is gravid containing a single term fetus which is fully haired and has a 64 cm crown to rump length. The placenta is starting to separate from the uterine mucosa which is congested red-brown in color. The fetal fluids are clear and unremarkable. The fetus is unremarkable aside from a mildly autolyzed appearance to the tissues. The cervix is closed. A single adrenal gland and the pancreas are unremarkable. The first stomach contains a moderate amount of very fine green forage forming a soft bolus. The mucosa is unremarkable. The second stomach compartment is also unremarkable and there is a soft formed bolus of fine granular green feed material in the third stomach compartment with markedly congested glandular mucosa at the caudal end. The intestines are generally unremarkable with focal segments of small intestine that are congested a red-brown in color and contain a red-brown fluid content. The cecum contains only scant amount of pasty green feces and there is a moderate amount of similar pasty green feces in the anterior spiral colon with infrequent slightly formed fecal pellets in the spiral colon. The distal colon is empty. The colonic mucosa is unremarkable. Mesenteric lymph nodes are small in size and cannot be located within the mesentery.

The select peripheral muscles and sciatic nerve examined as well as the stifle joint and hip joint are unremarkable. The brain is grossly unremarkable. The nasal mucosa is congested with small amounts of regurgitated stomach content in the nasal cavity.

Bacteriology

BACTERIAL AEROBIC CULTURE

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Lung Tissue	18-Oct-2007	No growth after 48 hours	
D0712047-01	Amanda	Liver Tissue	18-Oct-2007	No growth after 48 hours	
D0712047-01	Amanda	Bronchial Lymph Node Tissue	18-Oct-2007	No growth after 48 hours	
D0712047-01	Amanda	Thoracic Swab	18-Oct-2007	No growth after 48 hours	
D0712047-01	Amanda	Abdominal Swab	18-Oct-2007	No growth after 48 hours	

DIAGNOSTIC MYCOPLASMA CULTURE

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Lung Tissue	Pending		
D0712047-01	Amanda	Bronchial Lymph Node Tissue	Pending		

SALMONELLA CULTURE - MAMMALIAN

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Feces	19-Oct-2007	No Salmonella detected	

Biotechnology

BLUETONGUE VIRUS WADDL

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Lung Tissue	Pending		

BVD QRT PCR

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Spleen Tissue	17-Oct-2007	Negative	

EQUINE HERPESVIRUS1 QPCR

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Nasal Swab	17-Oct-2007	Negative	
D0712047-01	Amanda	Lung Swab	17-Oct-2007	Negative	

EQUINE NEUROPATHOGENIC HERPESVIRUS

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Nasal Swab	17-Oct-2007	Negative	
D0712047-01	Amanda	Lung Swab	17-Oct-2007	Negative	

INFLUENZA RRT-PCR

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Lung Swab	17-Oct-2007	Negative	

QRT PCR WEST NILE VIRUS (EQUINE)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Brain Tissue	18-Oct-2007	Negative	

Histology

T29:

Sections of liver, kidney, heart, lung, spleen, lymph node, peripheral nerve, skeletal muscle, trachea, adrenal glands, pancreas, mammary glands, uterus, inguinal hernia cyst, thymus, bladder, fetal tissues (lung, liver, kidney, and placenta) as well as multiple sections of gastrointestinal tract and brain are examined with findings summarized.

The fetal tissues are moderately autolyzed, but otherwise unremarkable.

The mandibular lymph node is markedly congested with infrequent small foci of hemorrhage. The bronchiolar lymph node is markedly congested and edematous with random focal loose fibrin deposits in the sinuses extending into medullary cords. There are scattered small foci of hemorrhage. There are also random collections of dust filled macrophages within medullary cords. The brain is unremarkable. In the section of sciatic nerve there are one or two axon digestion chambers containing central myelin ovoids or single macrophages.

The lung is congested and markedly edematous with dilated alveoli that contain very infrequent loose granular pink proteinaceous material compatible with edema fluid. There are very small, but increased numbers of free macrophages within alveoli. In addition there are infrequent thin hyalin membranes adhered to the surface of alveoli (pasted bands of fibrin). There is very infrequent mild focal alveolar epithelial cell hypertrophy and hyperplasia (Type II hyperplasia). There are scattered small foci of alveolar hemorrhage. In addition there are infrequent small collections of plump dust filled macrophages adjacent to terminal airways and infrequent small focal peribronchiolar lymphoid infiltrates. In the anterior ventral lung epithelium lining small bronchi and larger bronchioles is diffusely and moderately hyperplastic consisting of a tall pseudostratified columnar epithelium. Interlobular septa and pleural interstitium are variably expanded and edematous with a very mild scattered infiltrate of mononuclear cells and very mild hypertrophy of fibroblasts. Lymphatics are dilated and often have empty lumen. In one section of anterior ventral lung there are free small airways which contain large luminal plugs of dense fibrin that is undergoing earlier fibrous reorganization and is accompanied by moderate numbers of free macrophages. Alveolar epithelial hypertrophy and hyperplasia is more prominent in subpleural parenchyma of the anterior ventral lung.

Throughout the liver hepatocytes contain aggregates of small dark brown cytoplasmic granules compatible with secondary lysosomes and/or possible hemosiderin. In the spleen the red pulp is contracted. The kidneys are congested. The mammary gland is fairly well developed with moderate to large lobules containing acini that are filled with moderate amounts of vacuolated pink proteinaceous material compatible with milk. It is otherwise unremarkable. The uterine mucosa is congested and mildly edematous but otherwise unremarkable. The thymus is markedly atrophied compatible with a mature adult. The large cystic fluid filled pocket that was continuous with the right inguinal ring is composed of a somewhat irregularly arranged loose fibrous connective tissue which is lined by mesothelium and is variably edematous. There are scattered macrophages and lymphocytes in the stroma that are predominantly oriented towards the mesothelial surface.

Sections of intestine are autolyzed to a varying degree. In one section of small intestine there is a moderate increased superficial mucosal infiltrate of granulocytes (neutrophils and eosinophils?) that lie within the stroma of villi. The mucosa is otherwise relatively unremarkable. In the cecal mucosa there is a mild increased superficial mucosal infiltrate of apparent eosinophils. The mucosa is also congested and there are very infrequent small foci of superficial mucosal hemorrhage.

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

BOVINE CORONAVIRUS IMMUNOHISTOCHEM (IPX)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Block #T16	Tissue Block	19-Oct-2007	Negative	

BRSV - IMMUNOPEROXIDASE (IPX)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Block #T16	Tissue Block	19-Oct-2007	Negative	

BVD - IMMUNOPEROXIDASE (IPX)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Block #T16	Tissue Block	19-Oct-2007	Negative	

CHLAMYDIA - IMMUNOPEROXIDASE (IPX)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Block #T16	Tissue Block	19-Oct-2007	Negative	

EQUINE HERPES VIRUS 1/4 IMMUNOPEROXIDASE-IPX

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Block #T16	Tissue Block	19-Oct-2007	Negative	

IBR - IMMUNOPEROXIDASE (IPX)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Block #T16	Tissue Block	Pending		

MISCELLANEOUS - IMMUNOPEROXIDASE (IPX)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Block #T16	Tissue Block	19-Oct-2007	Negative	Paramyxovirus group 1 (avian) antibody is viral group specific

Immunology

BLUETONGUE VIRUS CELISA (BTVC CELISA)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Blood	18-Oct-2007	Positive	

BOVINE HERPES VIRUS 1 (IBR) - SVN

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Blood	Pending		

Bovine Respiratory Syncytiovirus - TVMDL

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Blood	Pending		

BOVINE VIRAL DIARRHEA TYPE I-SVN (BVDV I)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Blood	Pending		

BOVINE VIRAL DIARRHEA-TYPE II/BORDER DISEASE SVN

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Blood	Pending		

EPIZOOTIC HEMORRHAGIC DISEASE VIRUS-AGID (EHD)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Blood	Pending		

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

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Blood	Pending		

EQUINE INFLUENZA A-2 ALASKA - HI

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Clotted Blood	Pending		

EQUINE INFLUENZA TYPE A-1 - HI

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Clotted Blood	Pending		

EQUINE INFLUENZA TYPE A-2 - HI

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Clotted Blood	Pending		

PARAINFLUENZA VIRUS 3 - HI (PI3-HI)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Blood	19-Oct-2007	Negative @1:8	

Parasitology

FECAL EXAM - FLOTATION

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Feces	18-Oct-2007	No parasite eggs detected	

Toxicology

SELENIUM - TISSUE/OTHER

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Liver Tissue	18-Oct-2007	0.644	RL=0.020ppm

HEAVY METAL SCREEN

Animal/Source	Specimen	Specimen Type	Date Tested
D0712047-01	Amanda	Liver Tissue	18-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	42	PPM	0.100		25-100
Iron	159	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	24	PPM	0.100		20-90

Virology

BOVINE HERPES VIRUS 1 (IBR) - FA

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Lung Tissue	18-Oct-2007	Negative	
D0712047-01	Amanda fetus	Lung Tissue	Pending		
D0712047-01	Amanda fetus	Liver Tissue	Pending		

BOVINE RESPIRATORY SYNCYTIAL VIRUS - FA (BRSV)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Lung Tissue	18-Oct-2007	Negative	
D0712047-01	Amanda fetus	Lung Tissue	18-Oct-2007	Negative	
D0712047-01	Amanda fetus	Liver Tissue	18-Oct-2007	Negative	

DIRECT ELECTRON MICROSCOPY (EM)

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Lung Tissue	17-Oct-2007	Negative	

EQUINE HERPES VIRUS 1 (RHINOPNEUMONITIS) -FA

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Lung Tissue	18-Oct-2007	Negative	
D0712047-01	Amanda fetus	Lung Tissue	18-Oct-2007	Negative	
D0712047-01	Amanda fetus	Liver Tissue	18-Oct-2007	Negative	

VIRUS ISOLATION - MAMMALIAN

Animal/Source	Specimen	Specimen Type	Date Tested	Result	Comments
D0712047-01	Amanda	Lung Tissue	Pending		