Colorado State University
Veterinary Diagnostic Laboratories

CSU Veterinary Diagnostic Laboratory - Fort Collins
2450 Gillette Drive
Fort Collins CO 80523
Phone: (970) 297-1281 Fax: (970) 297-0320

dlab@colostate.edu

Report Date: 5/19/2022 9:22:07 AM
Sent By: [redacted]

Final Report

Case Coordinator: [redacted]

Accession No: F22-0039656
Date Received: 4/23/2022
Collection Date: 4/23/2022
Owner/Producer: BLM - Canon City Complex

[redacted]

Phone: [redacted]

Associated Parties

Clinic	[redacted]
Report To	USDA BLM Mustang Rescue Program Albert J Kane
Veterinarian Submitter	[redacted]

Animal Information

Name	Taxonomy	Age
Horse- 5	Horse - Mustang	2 Days

Diagnosis/Case Summary

F22-39656

HISTORY:
Equine, Blue tape 2, chip #840003218849589, die off of Mustangs in the BLM facility Canon City CO.

GROSS LESIONS:
1. Body condition: Good.
2. Lungs: Fail to collapse, wet and heavy, mottled gray to red regions, large volume of white froth in trachea, nasal cavity, and bronchi.
3. Mouth: No ulcers observed.
4 All other internal organs are within normal limits.

GROSS DIAGNOSIS:
Lungs: Severe acute edema with multifocal regions of pneumonia and mild hemorrhage.

HISTOPATHOLOGIC DIAGNOSES:
1. Lungs: Severe acute necrosuppurative bronchitis and bronchiolitis with regional extensive subacute suppurative bronchopneumonia.
2. Spleen: Severe lymphoid depletion.

COMMENTS:

This horse does have a severe diffuse necrosuppurative bronchitis and bronchiolitis with large regions of subacute suppurative as seen in the other BLM mustangs. Influenza A subtype H3 was detected in lung tissues. Bacterial cultures were not done on the lungs in this horse.

HISTOPATHOLOGY:

Slide 1.
This slide contains four sections of lung, and it is similar to the other BLM horses. These four sections of lung all are characterized by severe acute fibrinopurulent bronchitis bronchopneumonia.

Slide 2.
Liver: No significant lesions. The liver has undergone moderate autolysis.
Spleen: The lymphoid tissue of the spleen is depleted.
Kidney: No significant lesions.
Heart: No significant lesions.

Slide 3.
Pituitary gland: No significant lesions.
Large intestine/colon: No lesions. The mucosa of the large colon has undergone fairly severe autolysis. No lesions are found.

Slide 4.
Brain: No lesions found.

[redacted]
Prelim: 4/26/2022 TRS
Full Report: 5/11/2022 ljb

Lab Findings

Biotechnology/Regulatory

Influenza (H3 subtype) real-time PCR - 4/27/2022 8:36 AM

Specimen	Nucleic acid	Ct
Horse- 5 - 2 Days		
Tissue-Lung	Detected	26.01

Influenza A virus real-time PCR - 4/26/2022 3:38 PM

Specimen	Nucleic acid	Ct
Horse- 5 - 2 Days		
Tissue-Lung	Detected	25.91

Equine arteritis virus (EVA) real-time PCR - 4/26/2022 3:27 PM

Specimen	Nucleic acid	Ct
Horse- 5 - 2 Days		
Tissue-Lung	Not detected	0.00

Horse- 5 - Tissue-Lung

Test: Equine herpesvirus types1 and 4 (EHV-1, EHV-4) PCR - 4/26/2022 11:47 AM	
EHV-4 conventional PCR	Not detected
EHV-1 (neurologic) real-time PCR	Not detected
EHV-1 neurological Ct	0.00
EHV-1 (wild type) real-time PCR	Not detected
EHV-1 wild type Ct	0.00

General Results
Results for Real-time PCR are measured by Ct value. The Ct value correlates with original amount of target nucleic acid in the sample and is inversely proportional (the lower the Ct value the higher the starting amount of nucleic acid). Ct values ranging from 12-36.99 are positive. Ct values ranging from 37.00-40.00 are suspect/weakly positive. A Ct of 0.00 is interpreted as a negative result.

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Chemistry Toxicology

Horse- 5 - Tissue-Fixed - liver

Test: Selenium HAAS - 5/18/2022 3:52 PM	
Selenium	1.5 ppm(dw)

Molybdenum GFAAS - 5/17/2022 4:43 PM

Specimen	Molybdenum
Horse- 5 - 2 Days	
Tissue-Liver - 7	3.6 ppm(dw)

Magnesium FAAS - 5/17/2022 3:16 PM

Specimen	Magnesium
Horse- 5 - 2 Days	
Tissue-Liver - 7	300 ppm(dw)

Copper FAAS - 5/17/2022 12:41 PM

Specimen	Copper
Horse- 5 - 2 Days	
Tissue-Fixed - liver	18.8 ppm(dw)

Zinc FAAS - 5/17/2022 12:30 PM

Specimen	Zinc
Horse- 5 - 2 Days	
Tissue-Fixed - liver	175 ppm(dw)

General Results

COPPER Diagnostic level
Equine: Liver (DW)
Normal 15-30 ppm
Deficient < 12 ppm
Toxic > 3,000 ppm

MAGNESIUM Diagnostic level
Equine: Liver (DW)
Normal 520-800 ppm

SELENIUM Diagnostic level
Equine: Liver (DW)
Normal 1.0-4.0 ppm
Deficient 0.5-0.8 ppm
Toxic > 10.0 ppm

ZINC Diagnostic level
Equine: Liver (DW)
Normal 160-500 ppm
High 640-2,000 ppm
Toxic > 5,000 ppm

Please note that there is no published normal **MOLYBDENUM - LIVER** concentration range available for **EQUINE**, therefore the diagnostic information for **BOVINE** has been provided for comparison.

MOLYBDENUM Diagnostic level
Bovine: Liver (DW)
Normal 0.6-6.0 ppm
Toxic > 10.0 ppm
Note that molybdenum toxicity occurs only when copper levels are deficient. Molybdenum levels in the toxic range are not a problem when copper levels are normal.

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Pathology

Necropsy histopathology - 5/11/2022 3:18 PM

Specimen	Histopathology
Horse- 5 - 2 Days	
Whole Animal - 5	Complete

Necropsy-equine gross examination only - 5/11/2022 3:18 PM

Specimen	Necropsy
Horse- 5 - 2 Days	
Whole Animal - 5	Complete

Client Report History

Report Type	Delivery Method	Sent To	Date Sent
[redacted]	[redacted]	[redacted]	[redacted]

Bulletin(s)

Thank you for choosing CSU for your diagnostic services. If you have any questions about test interpretation, we are happy to provide assistance. Please consult a licensed veterinarian regarding treatment options and management decisions