

FOREIGN ANIMAL DISEASE CASE REVIEW

FOR

USDA FAD AWARENESS FOR DVMS

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PRESENTATION OUTLINE

- ✘ National Perspective of Foreign Animal Disease Investigations
- ✘ Florida Perspective of Foreign Animal Disease Investigations
- ✘ Objectives of a FAD/EDI Investigation
- ✘ Critical Elements of a FAD/EDI Investigation
- ✘ Critical Data/Information is to be Collected
- ✘ USDA FAD Threat List
- ✘ Recent Investigation Summaries
- ✘ Information available in VS Memorandum No. 580.4



LIST OF FOREIGN ANIMAL DISEASES (FAD)

- ✘ Tier 1 - diseases are those of national concern. They pose the most significant threat to animal agriculture in the United States, as they have the highest risks and consequences. This category includes:
 - African swine fever
 - classical swine fever
 - foot-and-mouth disease
 - notifiable avian influenza (H5 and H7 strains that need to be reported to the World Organization for Animal Health, or OIE)
 - virulent Newcastle disease



CHALLENGES OF AN FAD RESPONSE

- ✘ Significant disruptions to interstate commerce and international trade can occur.
- ✘ Response activities are complex and require significant planning and preparation before an event.
- ✘ Outbreaks can become large or widespread.
- ✘ Travel may be affected



WHY FOREIGN ANIMAL DISEASES MATTER

Preparing for and responding to foreign animal diseases (FADs) are critical activities to safeguard our nation's animal health, public health, and food supply.

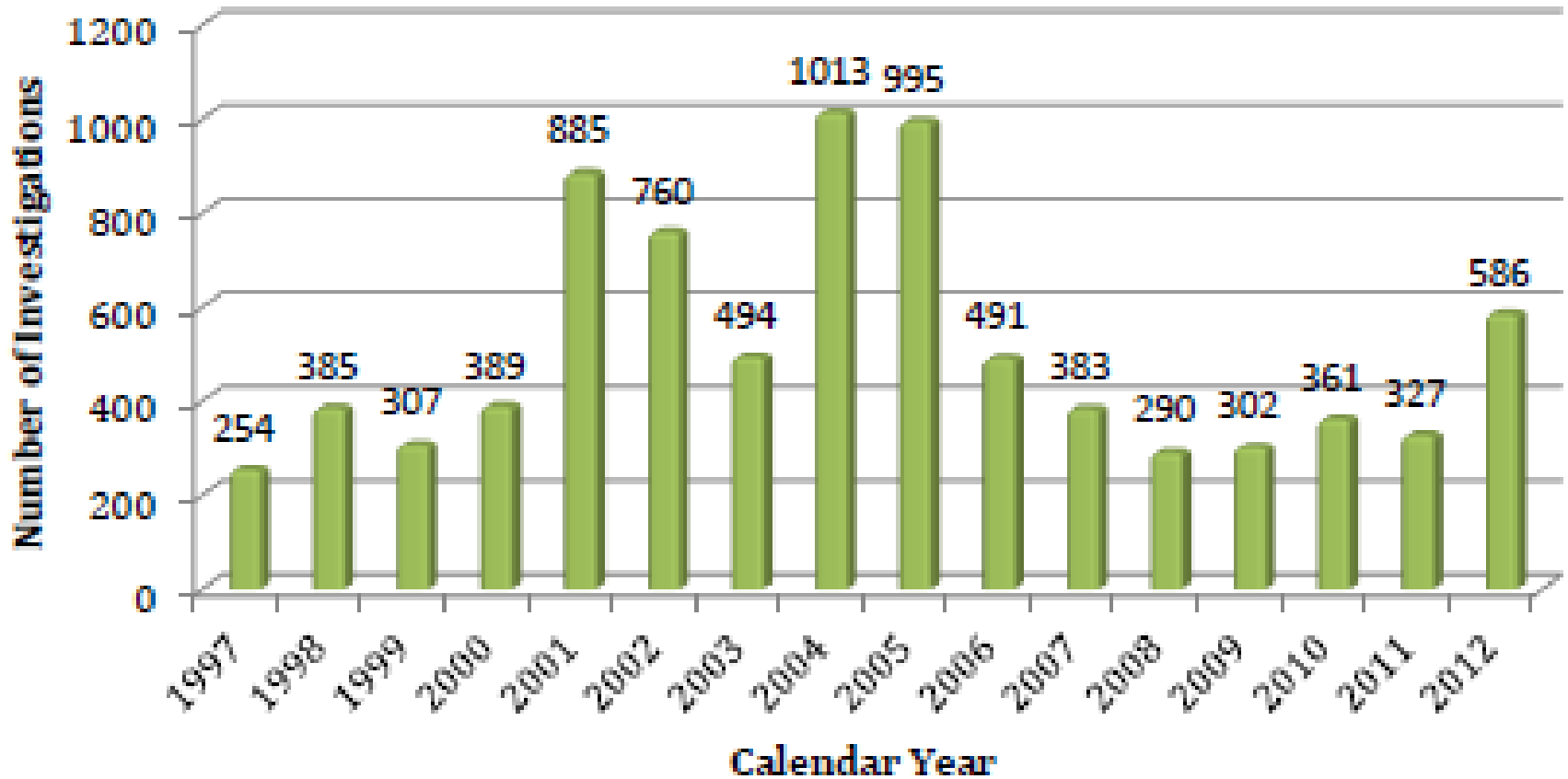


RECENT DISEASE OUTBREAKS

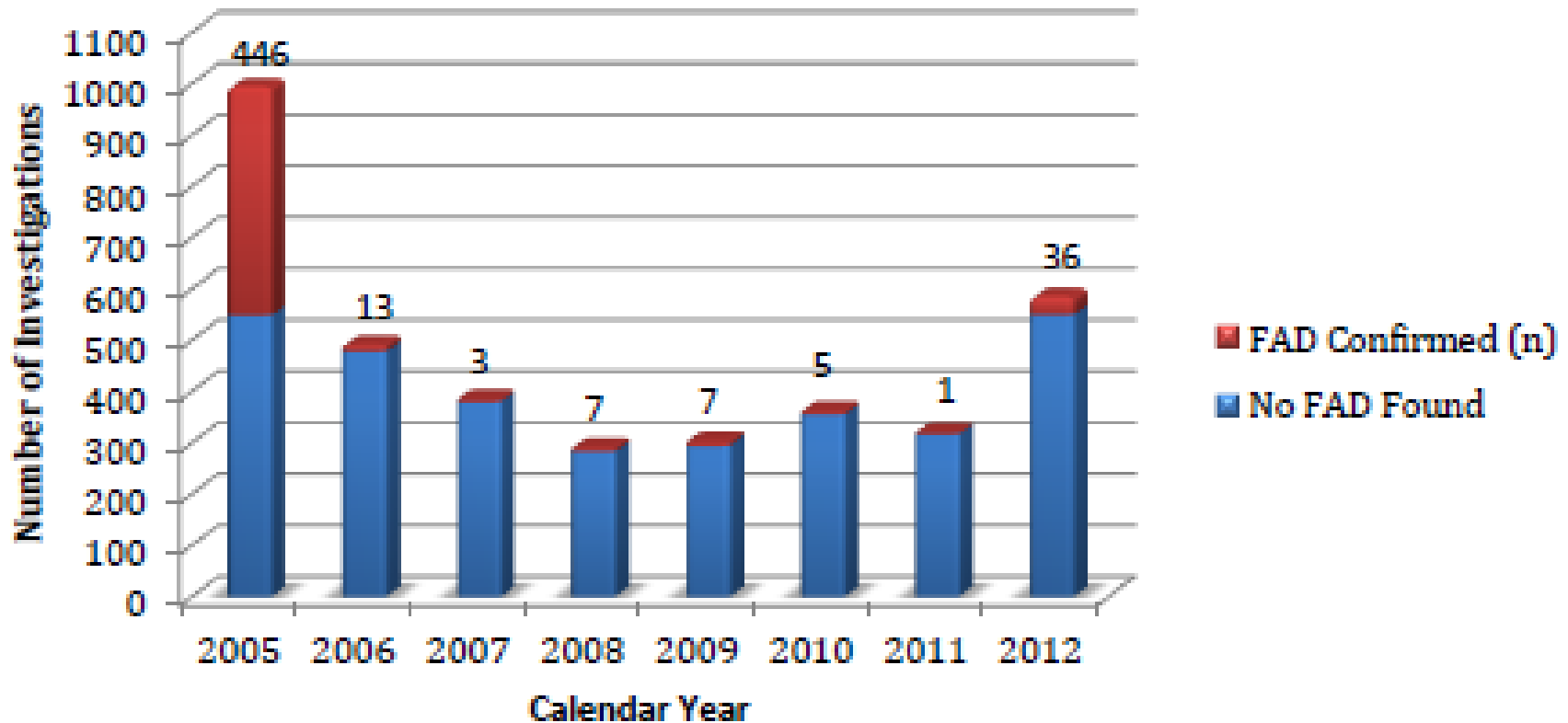
- ✘ 1971 US—8 million birds killed (END)
- ✘ 1983 US—17 million birds killed (AI)
- ✘ 1997 Taiwan— 4 million hogs killed (FMD)
- ✘ 1998 Netherlands—11 million hogs killed (CSF)
- ✘ 1999 Malaysia—1 million hogs killed, 256 humans sick and 100 died (Nipah)
- ✘ 1990-2001 UK – Mad Cow Disease >\$ 3 billion
- ✘ 2001 UK - 10 million killed, \$13B (FMD)
- ✘ 2002-03 US – 5 million killed, \$150-200 Million (END)



FAD INVESTIGATIONS FROM 1997 TO 2012

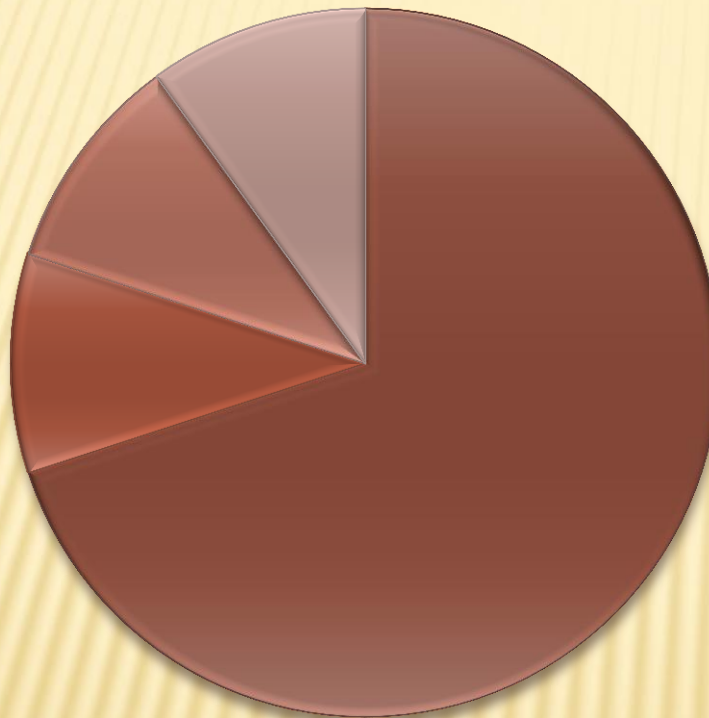


FAD INVESTIGATIONS BY RESULT 2005 TO 2012



FADS IN FLORIDA

Initiating Reason



■ CS - Vesicular lesions

■ Positive Surveillance Sample

■ CS - avian death above baseline

■ CS- maggots

Changes by year/ongoing outbreaks



CONFIRMED FAD INCIDENTS

- ✘ Dec 2008 to 2011 – CEM – Fjord stallion imported from Denmark in 2000 – 23 stallions, 5 mares positive, with 1000 animals exposed, 28 states involved
- ✘ Oct 2009 to ongoing – Theileria equi & Babesia cabali (EP) – over 190,000 horses tested, 22 states involved



CONFIRMED FAD INCIDENTS

- ✘ April 2010 – Rabbit hemorrhagic disease – premise in Minnesota, 25 rabbits died, no source or outbreak identified
- ✘ May 2010 to July 2010 – Vesicular stomatitis in Arizona, 2 premises
- ✘ 2011- CEM in an Arabian stallion born in Arizona, not epidemiologically linked to cases in previous years. All in-contact stallions and mares were tested, none had positive results
- ✘ 2012 - Vesicular Stomatitis, total of 2 equine premises in 2 Colorado counties and 34 equine premises in 10 New Mexico counties were VSV-positive, all New Jersey serotype



OBJECTIVES OF A FAD FIELD INVESTIGATION

Provide a Veterinary Medical
Assessment and Make a Differential
Diagnosis List



CRITICAL ELEMENTS OF A FAD/EDI INVESTIGATION

- ✘ Interviewing persons for incident history
- ✘ Observing Clinical Signs
- ✘ Performing Physical Examinations
- ✘ Collecting/Analyzing Epidemiological Information
- ✘ Collecting Diagnostic Samples as Necessary
- ✘ Performing Necropsies



CRITICAL DATA/INFORMATION

- ✘ Species Affected
- ✘ Clinical Signs
- ✘ Lesions Observed
- ✘ Herd/Flock Morbidity and Mortality Rates
- ✘ Duration of Illness
- ✘ Vaccination History
- ✘ Nutritional Status
- ✘ Premise Conditions
- ✘ Movement History
- ✘ Contact History
- ✘ Evidence or indication of pest or vector
- ✘ Evidence or indication of a Zoonosis



SO WHAT DISEASE IS #1 ON THE FAD THREAT LIST ?



FAD THREAT LIST

**K. Table III-1: List of Terrestrial FAD Threats to the United States and its Territories.
This List Does Not Contain All Potential Terrestrial FAD Threats.**

Foreign Animal Disease	Primary Type of Animal Affected	NVS Most Dangerous Disease List	Highly Contagious Disease (HCD)	Contagious Disease (CD)	Vector Borne Disease	Zoonotic Disease Potential
Highly Pathogenic Avian Influenza (HPNAI)	Avian, and Others	No. 1	Yes	Yes	No	Yes
Foot-and-Mouth Disease	All Cloven Hoofed Animals	No. 2	Yes	Yes	No	No
Rift Valley Fever	Bovine, Ovine, Caprine, Canine	No. 3	No	Yes	Yes	Yes
Exotic Newcastle Disease (Virulent ND)	Avian	No. 4	Yes	Yes	No	Yes Minor
Nipah Hendra	Swine, Equine	No. 5	Yes (Nipah)	Yes	No	Yes
Classical Swine Fever	Swine	No. 6	Yes	Yes	No	No
African Swine Fever	Swine	No. 7	Yes	Yes	Yes	No
Rinderpest	Bovine, Cloven Hoofed Animals	No. 9	Yes	Yes	No	No
Japanese Encephalitis	Equine, Swine	No. 10	No	No	Yes	Yes
African Horse Sickness	Equine, Donkey, Mules	No. 11	No	No	Yes	No
Venezuelan Equine Encephalitis	Equine, Avian,	No. 12	No	No	Yes	Yes
Contagious Bovine Pleuropneumonia	Bovine	No. 13	Yes	Yes	No	No
Heartwater (<i>Ehrlichia ruminantium</i>)	Bovine, Ovine, Caprine, others	No. 14	No	No	Yes	No
Akabane	Bovine, Ovine, Caprine	No. 17	No	No	Yes	No



FAD Threats List Continued

Swine Vesicular Disease	Swine	n/a	Yes	Yes	No	No
Lumpy Skin Disease	Bovine	n/a	No	Yes	Yes	No
Peste des Petits Ruminants	Caprine, Ovine	n/a	Yes	Yes	No	No
Sheep Pox, Goat Pox	Ovine, Caprine	n/a	Yes	Yes	No	No
Glanders	Equine, Donkey, Mules	n/a	Yes	Yes	No	Yes
Dourine	Equine	n/a	No	Yes	No	No
Contagious Equine Metritis	Equine	n/a	No	Yes	No	No
Contagious Caprine Pleuropneumonia	Caprine	n/a	Yes	Yes	No	No
Nairobi Sheep Disease	Ovine, Caprine	n/a	No	No	Yes	Yes Minor
Surra (<i>Trypanosoma evansi</i>)	Equine, Donkey, Bovine, Others	n/a	No	Yes	Yes	No
Theileriosis (East Coast Fever)	Bovine	n/a	No	No	Yes	No
Bovine Babesiosis (FAD if detected outside of quarantine areas)	Bovine	n/a	No	No	Yes	No
Vesicular Stomatitis Virus	Equine, Bovine, Swine Sheep, Goats	n/a	No	Yes	Yes	Yes Rare
Equine Piroplasmiasis	Equine	n/a	No	No	Yes	No
Rabbit Hemorrhagic Disease	Domestic Rabbits (European Breeds)	n/a	Yes	Yes	No	No



RECENT INVESTIGATIONS IN FLORIDA

- ✘ Cattle/Bison
 - + Complex Case of Cattle Deaths
 - + Malignant Catarrhal Fever in Bison
- ✘ Sheep/Goats
 - + Bluetongue in a sheep
 - + Contagious Ecthyma in Goats
- ✘ Swine
 - + Pox lesions in swine
- ✘ Avian
 - + Newcastle's Disease
 - + Pigeon Paramyxovirus



COMPLEX CASE OF CATTLE DEATHS



CATTLE DEATHS WITH ORAL LESIONS

- ✘ Observed a cow that had died earlier that day and was informed that they had two cows with similar signs that were still alive.

+ History:

- ✘ Adult cattle with clinical signs consistent with hypomagnesaemia (Grass Tetany) two weeks prior to investigation
- ✘ Cattle progressively developed the following signs
 - ★ Blistered Muzzle
 - ★ Reddened and Inflamed lesions around the eye with a green ocular discharge
 - ★ Ulcerative oral lesions (tongue and buccal mucosa)
 - ★ Inflamed skin on Udder/Teats
 - ★ Inflamed skin at coronary band of feet
 - ★ Dark colored watery diarrhea
 - ★ Death



DIFFERENTIAL DIAGNOSIS

- ✘ FMD (Initial report by the reporting DVM due to the oral lesions. His gut feeling was that it was not FMD, but didn't want to ignore this and be a newspaper headline)
- ✘ VS
- ✘ BVD
- ✘ Malignant Catarrhal Fever
- ✘ Exotic Strain of Bluetongue/EHD
- ✘ Plant Toxicosis

It is important to remember that FADDL does not provide testing for same agents as NVSL...

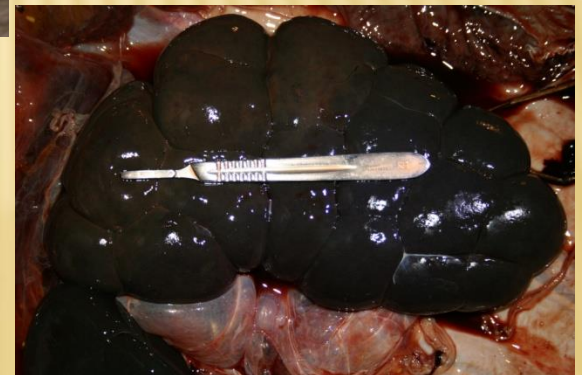
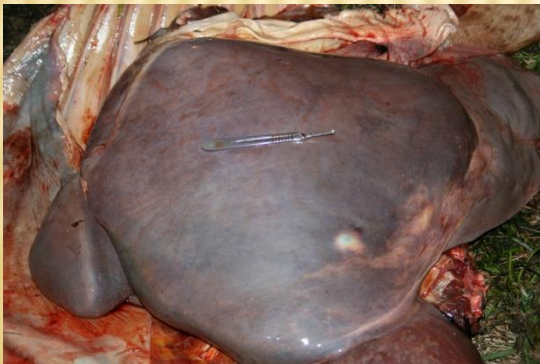
Make a Plan that Results in a Diagnosis even if it is not the FAD agent suspected



IMAGES OF CLINICAL CASES



NECROPSY IMAGES OF INITIAL CASE

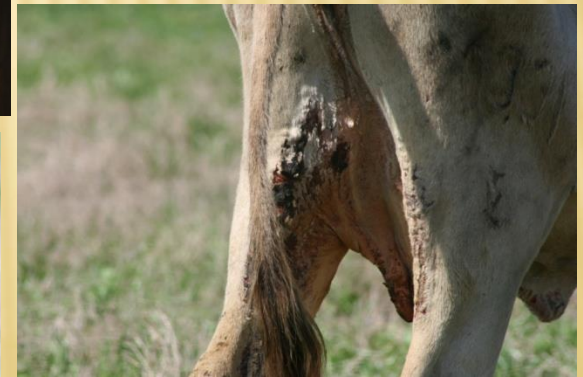


FAD CASE UPDATE

- ✘ Received a call on 4-5 days following the initial examinations that some of the cows were displaying signs of Photosensitization (sunburn)
- ✘ The clinical signs were now evident in an adjacent herd of ~200 head of 2 year old heifers but not to the degree of the older herd of cows



PHOTOSENSITIZATION



CASE SELECTED FOR SUBMISSION TO BADDL



CASE UPDATES

- ✘ All Testing at FADDL and NVSL – No Viral or Bacterial Agents were Suspected
- ✘ Investigation shifted to Plant Toxicosis (due to Clinical Signs)
- ✘ Cattle were moved off the affected pastures as precaution
- ✘ Dr. Owen Rae from UFL CVM came to assist in the investigation of a plant toxicosis
- ✘ Plants collected for identification and testing
 - + Ryegrass with possible Fungal growth (endophytes)
 - + Plants thought to be in the Mustard Family
 - + Hairy Vetch
 - + Miscellaneous unidentifiable plants



POTENTIAL TOXIC PLANT ID

- ✘ KADDL's Dr. Johnson saw changes in the histopath lesions on 2nd Necropsy consistent with a Plant Alkaloid Toxicity in the Liver and suggested several possibilities including Senecio spp.
- ✘ Dr. Rae called on the same day that IFAS Botanist Identified a poisonous plant in the Senecio spp. family - Butterweed



BUTTERWEED – *PACKERA GLABELLA*



PYRROLIZIDINE ALKALOID TOXICITY

- ✘ Pyrrolizidine Alkaloids (PA) are the toxic agent in Butterweed
 - + Toxic to Cattle and Horses (Sheep/Goats are able to detoxify the PAs)
 - + Estimates are that consumption of 1-5% of Body Weight will cause disease
 - + In horses 1 Senecio plant per day will cause clinical disease in 2 weeks
- ✘ Absorbed in the intestine and transported to the liver where they are metabolized to pyrroles
- ✘ Pyrroles are toxic metabolites that are very reactive chemically causing photosensitization
- ✘ Liver is primary organ effected and ultimately fails
- ✘ Damage occurs also to lung which leads to right heart failure
- ✘ Kidney damage also occurs



CASE CLOSURE

- ✘ Investigation started out as a FAD/EDI Investigation
 - + FAD Protocols Followed and the Presence of a FAD Ruled Out
- ✘ Investigation uncovered a little known Plant Toxicosis
- ✘ Case Coordination of Field and Laboratory Ended with a Diagnosis
 - + An Example of Team Work



ACUTE DEATH LOSSES IN BISON WITH HEMORRHAGIC LESIONS OF MULTIPLE ORGAN SYSTEMS



CASE HISTORY (INDEX CASE)

- ✘ Exhibition herd of 10 animals
- ✘ Feb 8th an adult female Bison was showing signs of rapid respiration that ended in death by 9:20 Am
- ✘ The animal had not been ill the previous day.
- ✘ On 2/8, no other animals with illness.
- ✘ This animal was submitted to KDL for a necropsy

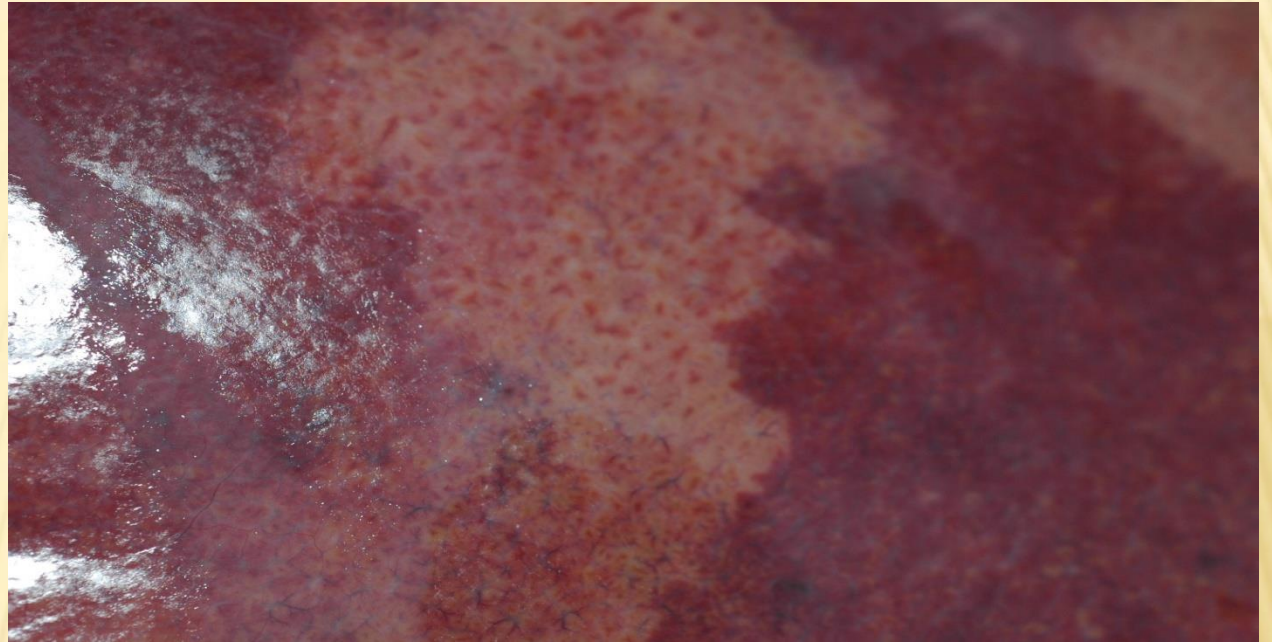


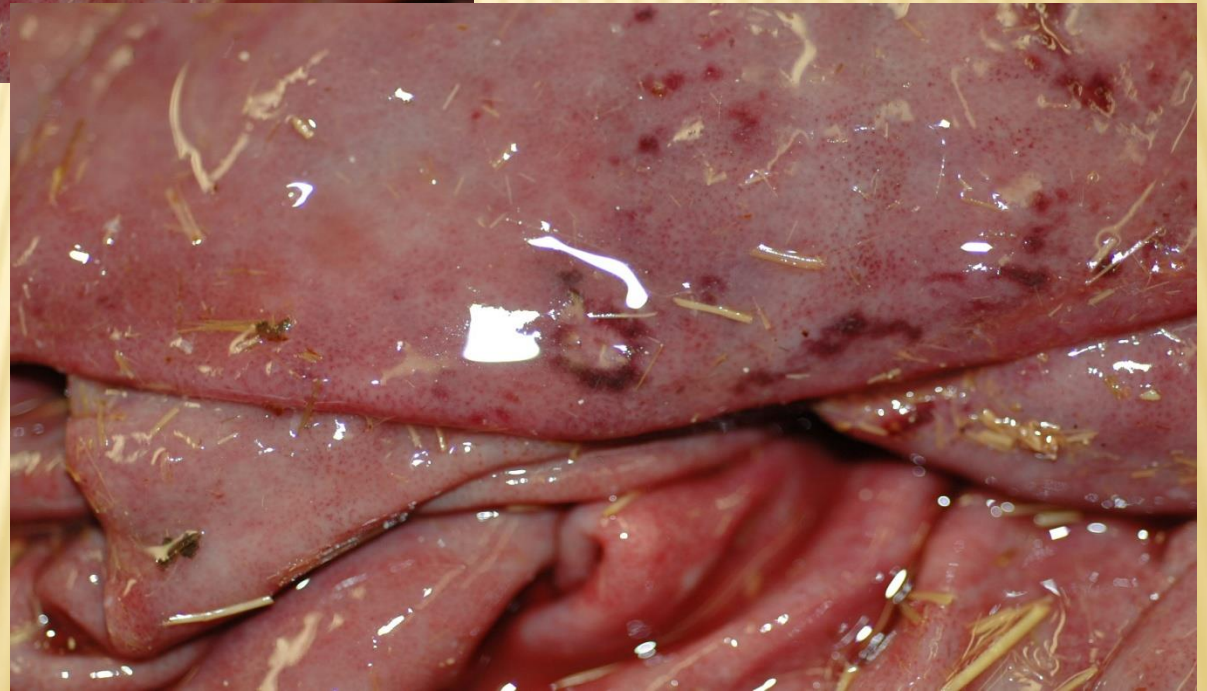
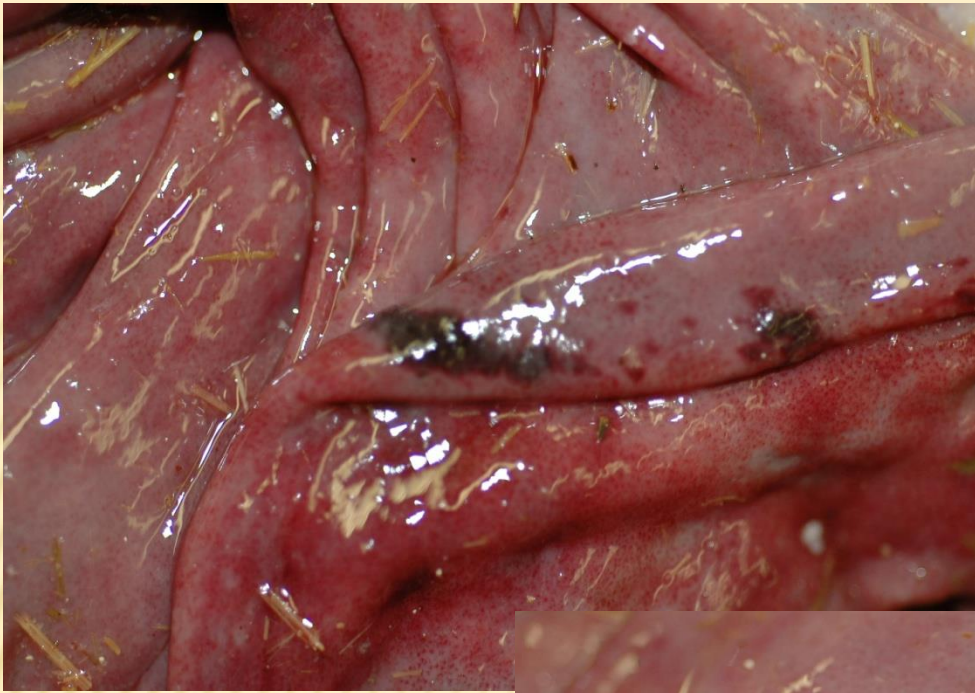


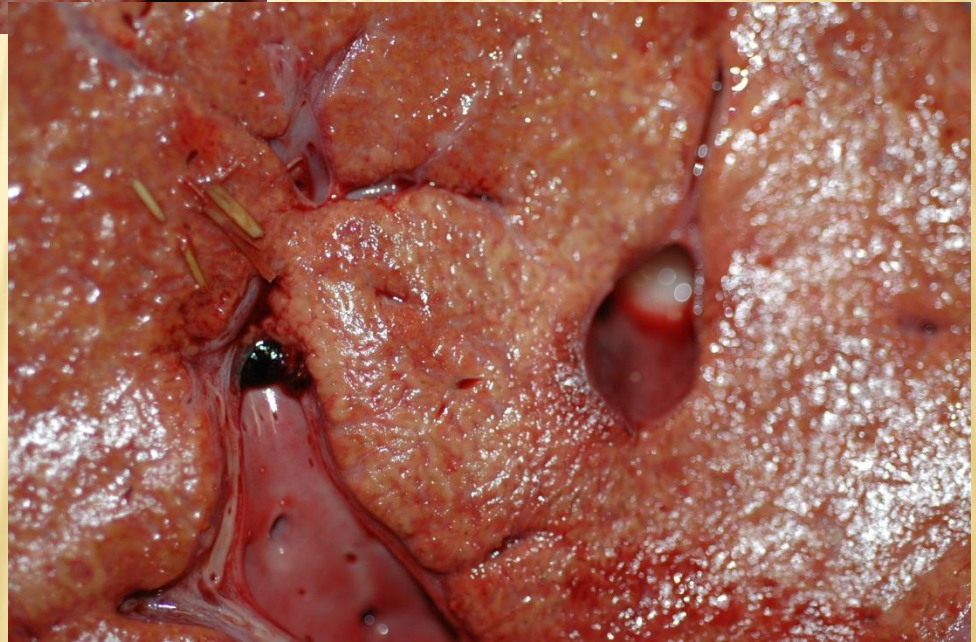
FIRST CASE, DC

- ✘ On 2/08/2006 female, pregnant buffalo for necropsy.
- ✘ S.C.T. and skeletal muscles . Hematomas.
- ✘ Epistaxis and clots of blood in numerous passages.
- ✘ Respiratory and digestive system. Millitary petechial hemorrhages.
- ✘ Lungs. Hemorrhage, interlobular edema.
- ✘ Heart. Subendocardial hemorrhage, severe.
- ✘ Lymph nodes. Lymphadenopathy, hemorrhagic, generalized.
- ✘ Small intestine. Congestion, diffuse.
- ✘ Colon and rectum. Hemorrhage, petechial. Intraluminal clots of blood.
- ✘ Kidneys. Interstitial nephritis, chronic.
- ✘ Liver. Hepatitis, necrotizing, chronic.
- ✘ Urinary bladder. Cystitis, hemorrhagic, severe.
- ✘ Eyes. Corneal opacity.









FETUS

- × 5 months-old fetus:
 - + Lungs. Hemorrhage, petechial, multifocal.
 - + Spleen. Hemorrhage, petechial, milliary.
 - + Kidney. Reddened.
 - + Placenta. No lesions



CASE HISTORY (#2)

- ✘ On 2/9 another adult female began showing signs of lethargy, no appetite, excessive tearing with a cloudy right cornea (eye).
- ✘ She also had a fever of 104 °F, rapid pulse, but normal lung sounds.
- ✘ Blood samples were sent to KDL and a general treatment plan was initiated (Antibiotics, Anti-inflammatory meds, and B complex vitamins).
- ✘ She was retreated on 2/13 and now both corneas were cloudy (and both eyes were bulging) and she was unable to see.
- ✘ She was treated again on 2/16, but further treatment was not continued because it was more stressful than successful.
- ✘ Note: this animal was euthanized after the diagnosis for humane reasons (her condition slowly continued to deteriorate)



CASE HISTORY (#3)

- ✘ On 2/15 (PM) a third animal (Fe) was seen as lethargic and was examined by the DVM on 2/16.
- ✘ Presenting signs: lethargy, bloody discharges from the nostrils, excessive tearing, corneal edema, bulging eyes, and an exaggerated gait (although the gait problem had been seen the previous year in this animal).
- ✘ On 2/17 at 7:30 she was found down, thrashing, kicking wildly and could not rise.
- ✘ She subsequently died at 8:30 AM with no further notable lesions.
- ✘ This animal was submitted to KDL for a necropsy

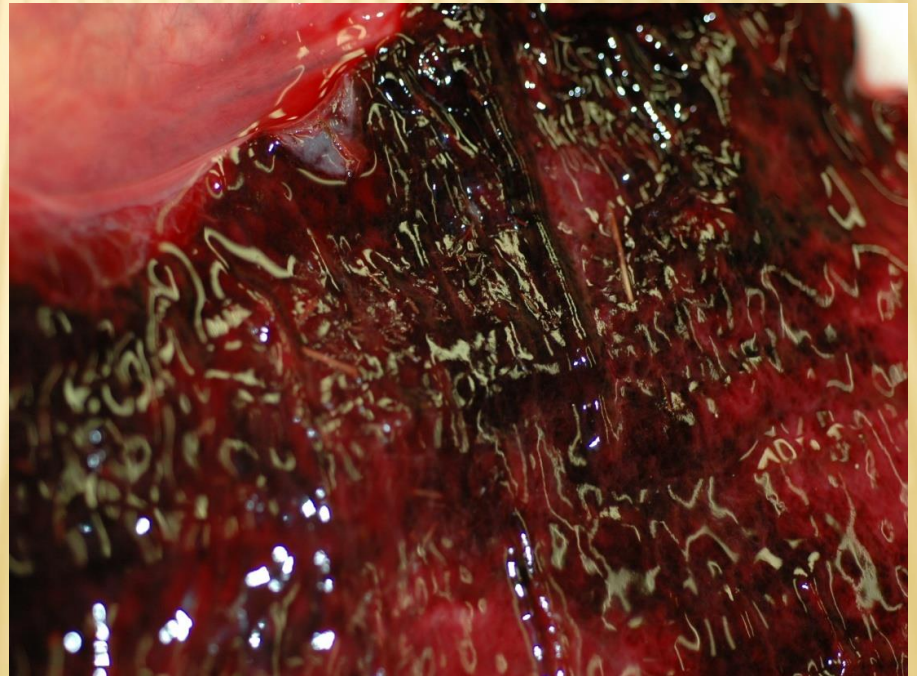
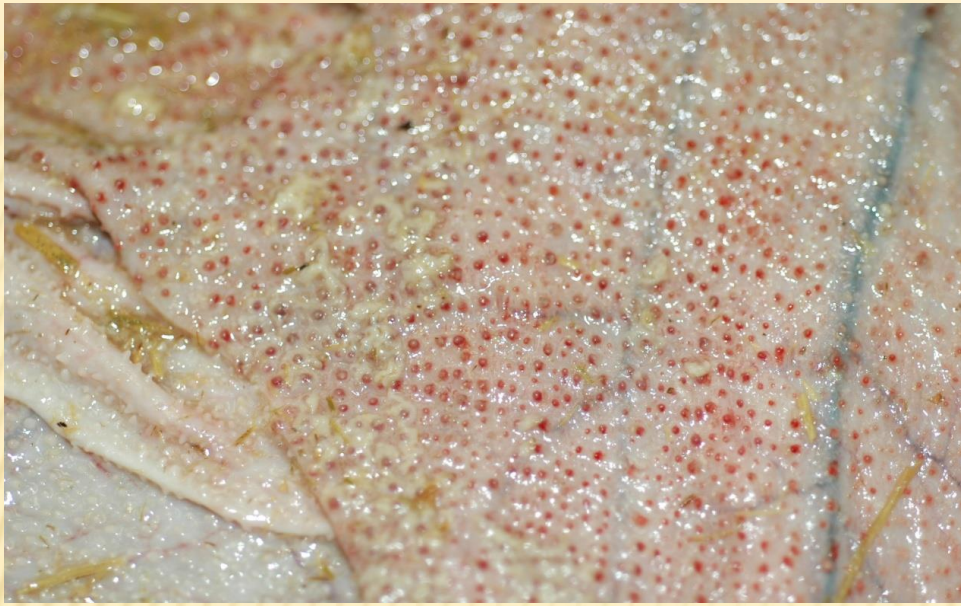


NECROPSIES CASE 2 AND 3

- ✘ 3/14/2006. Female non-pregnant Buffalo.
- ✘ 3/29/2006. Male Buffalo.

- ❖ All cases exhibited similar symptoms, signs and lesions to Case 1
- ❖ Last two cases exhibited more severe lesions in Omasum and Abomasum.





HISTOPATHOLOGY, DC

- ✘ Kidney. Interstitial & periarterial nephritis. Pyelitis.
- ✘ Liver. Hepatitis, periportal and periarterial, lymph/plasm.
- ✘ Small intestine. Enteritis, atrophic & hemorr.
- ✘ Colon. Colitis, Hemorrhagic.
- ✘ Urinary bladder. Cystitis, fibrinohemorrhagic.
- ✘ Lung. Edema. Hemorrhage, periarteritis.
- ✘ Brain. Encephalitis, perivascular (cuffing),
Epidural & perivascular Hemorrhage.
- ✘ Eye. Iridocyclitis, perivascular, non-suppurative.
- ✘ Abomasum. Abomasitis, necrotizing, perivascularitis.
- ✘ Omasum. Omasitis, lymphocytic, severe.



CHARACTERISTIC LESIONS

- ✘ Corneal Opacity (arteritis)
- ✘ Neurological symptoms (Perivascular encephalitis, vasculitis)
- ✘ Mucopurulent discharge eyes, nostrils, erosions oral mucosa.
- ✘ Forestomachs & intestine: Hemorrhage
- ✘ ARTERITIS, ENDARTERITIS,PHLEBITIS
- ✘ Periportal hepatitis
- ✘ Periarterial and interstitial nephritis.
- ✘ Hemorrhagic cystitis



EPIDEMIOLOGICAL INFORMATION

- ✘ The Bison herd at facility for 3 years
- ✘ Sheep from out of state (with a valid OCVI) were leased to facility for their Holiday Program (Nov of previous year)
- ✘ Sheep were housed totally separate from the Bison. No Clinical disease seen in the sheep.
- ✘ Only exposure was through the arena but the bison and sheep were never in the arena at the same time!



DIFFERENTIAL DX

- ✘ BVD (Mucosal Disease)
- ✘ IBR
- ✘ Bluetongue
- ✘ FMD
- ✘ VS
- ✘ Rinderpest (thought to be eradicated)



PRESUMPTIVE/CONFIRMED DX

- ✘ Clinical Signs, History of exposure to sheep and a Necropsy with clinical signs consistent with MCF, a presumptive DX of MCF was made.
- ✘ NVSL confirmed that the samples from the two animals submitted by KDL from DS were indeed positive for OHV 2 ...
 - + Sheep Associated Malignant Catarrhal Fever



TWO FORMS OF MCF

- ✘ AHV 1 is primarily in Africa
 - + Susceptible Species exposed to Wildebeest carriers
- ✘ OHV 2
 - + Worldwide distribution
 - + Carriers are domestic/wild Sheep and Goats
 - + 1st case in US in 1970's (South Dakota)
- ✘ These are Old Diseases



KEY FEATURES

- ✘ Carrier Species are Asymptomatic
- ✘ Low Morbidity 30-40 % (# of sick animals)
- ✘ High Mortality 90-100% (in affected animals)
- ✘ This is an important viral disease of farmed or ranched Bison
- ✘ Some type of stress may be a necessary factor to see disease with this agent
- ✘ Both AHV and OHV are Herpesviruses



TRANSMISSION

- ✘ Ewes have a recrudescence of the viral infection without clinical signs in late pregnancy
- ✘ Ewe pass OHV 2 to their lambs 2-3 months after lambing
- ✘ Both lambs and susceptible species are infected upon close contact with infected sheep
- ✘ Nasal Secretions are thought to be the main way the virus is transmitted



INCUBATION PERIOD

- ✘ Experimentally 9-77 days
- ✘ Generally thought to be 50+ days
- ✘ One actual outbreak was demonstrated to be as long as 220 days (Bison)



3 CLINICAL FORMS OF THE DISEASE

- ✘ 1. Peracute (Less than 3 days course of disease)
 - + Fever
 - + Severe inflammation of the oral and nasal membranes
 - + Bloody diarrhea with death in 1-3 days
 - + Or may just find a dead animal
- ✘ 2. Intestinal (4-9 days course of disease)
 - + Fever
 - + Diarrhea
 - + Reddened oral and nasal membranes
 - ✘ with discharge
 - + Swollen lymph nodes..... →



3RD AND MOST COMMON FORM OF MCF



✘ Head and Eye Form

- + Nasal and eye discharges that progress from clear to yellow/cloudy
- + Muzzle and nostrils eventually get crusty which leads to open mouth breathing and drooling
- + Intense redness and necrosis of the oral mucosa
- + Eye lesions start with corneal cloudiness which may be in one or both eyes
- + Fever (104-107 F) is common
- + Sometimes the above signs are accompanied by a nervous component (trembling, shivering, uncoordinated gait).



DIFFERENTIAL DIAGNOSIS

- ✘ BVD (Particularly Mucosal Disease Form)
- ✘ Bluetongue
- ✘ VS (don't forget FMD and Rinderpest)
- ✘ Salmonellosis
- ✘ Pneumonia Complex
- ✘ Mycotoxins
- ✘ Poisonous Plants (Lantana)
- ✘ Oral exposure to caustic materials



TREATMENT

- ✘ None
- ✘ Survival is rare
- ✘ Mortality reaches 100%
- ✘ No available vaccine
- ✘ Recovered animals will be virus carriers



SO...

Any susceptible animal with sudden death, fever, erosions of the mucosa, nasal and eye discharges, one or both eyes cloudy should be tested for MCF particularly if there is a history of exposure to sheep, goats, antelope or wildebeest.



PREVENTION/CONTROL OF SHEEP/GOAT ASSOCIATED MCF

- ✘ Separate infected carrier animals (sheep/goats) from susceptible species
 - + Stocking of cattle ranches with alcelaphine antelope (Wildebeest, Oryx, Ibex, Muskox,) and wildebeest, sheep or goats should be discouraged.
- ✘ Use virus free sheep/goats
 - + It is suggested to require a negative MCF serological test. Similar testing should occur before wild ruminants are placed in or transferred between premises as a preventative measure.



ORAL LESION CASE IN A SHEEP



BRIEF HISTORY

- ✘ 1-2 year old pregnant Southdown ewe (10 head sheep total)
- ✘ Anorexia
- ✘ Temp 103
- ✘ Oral lesions
- ✘ Nasal lesions (crusts- serosanguinous discharge)
- ✘ Clinical Respiratory signs (slight cough/congestion)
- ✘ Private DVM called and asked for assistance due to oral lesions



HISTORY (CONT)

- ✘ Affected ewe shared pasture with 2 other young ewes (they were clinically normal)
- ✘ Affected ewe came to premise with another ewe 2 months prior to this episode of clinical disease (Affected ewe from MA: other from OK)
- ✘ Only one other ewe had left premise (breeding)
- ✘ Adjacent premise had goats and 1 calf < 1 yr
- ✘ No other neighbors with cattle, sheep, or goats



CLINICAL EXAM

- ✘ Ulcer on the buccal edge of the dental pad 0.5 cm X 2.5 cm
- ✘ Crusts on nares with Serosanguinous secretions
- ✘ Slight mucopurulent discharge from both eyes
- ✘ Crusts similar to those on nares found around rectum and vulva
- ✘ Soft productive cough/slight respiratory congestion
- ✘ Mild inflammatory lesions at the coronary band and interdigital area but no lameness
- ✘ Seemed depressed and dull but was active when asked to move
- ✘ Eating very gingerly and Temp on day 2 was 102.



VISUAL EXAM



VISUAL EXAM



VISUAL EXAM



VISUAL EXAM



DIFFERENTIAL DX

- ✘ Bluetongue
- ✘ EHD
- ✘ Contagious Ecthyma (Orf)



DX

- ✘ Virus Isolation in Cell Culture – Reovirus
- ✘ Bluetongue Virus Isolation – Positive
- ✘ Bluetongue AGID – Positive
- ✘ EHD AGID – Negative
- ✘ Isolate was Positive for Type 2 Bluetongue



CONCLUSIONS

- ✘ DX confirmed BT
 - + This type of BT is not uncommon
 - + Not a vesicular disease (oral ulcers/erosions)
- ✘ This sheep came from another state and was likely naïve for this type of BT
- ✘ Owners other sheep, the neighbors goats, or deer populations are probable reservoir of this virus
- ✘ Culicoides vectors very prevalent in this area
- ✘ Sadly, a few months later this animal presented with a prolapsed uterus and died (unrelated to the BT)
- ✘ Three years later there was another mild case of BT at this facility.



REPORT OF VESICULAR LESIONS IN GOATS



BRIEF REPORT

- ✘ DVM examined the goats and saw oral lesions. Due to recent reports of VS, this DVM was concerned that he needed to report this even though he did not think it was VS.
- ✘ 5 goats were purchased from a “trader”
- ✘ Owner noticed slight cough w/o nasal discharge and ocular discharge.
- ✘ Treated eyes with T/C ointment, treated with topical pyrethrin, started feeding peanut hay
- ✘ Diarrhea developed and put on neomycin and sulfa orally on the advice of the feed store



CASE PROGRESSION

- ✘ 10 days after receiving the goats, the owner noticed oral lesions on the mouth
- ✘ Called DVM, and his exam triggered the referral exam by us to rule out VS



CLINICAL EXAM

- ✘ 2 of 5 goats had lesions (scabs) at the commissure of the mouth (dry, hard scabs suggested that the lesions were there well before the owner saw the lesions)
- ✘ Ocular lesions / slight lacrimation (Resp Sys dis)
- ✘ Nasal lesions / Slight nasal discharge (Resp Sys dis)
- ✘ No other oral lesions (no oral cavity/tongue lesions)
- ✘ No lesions at the coronary band
- ✘ All goats eating well and diarrhea was resolving
- ✘ Owner was concerned that this might be a zoonotic disease as her son possibly might be immuno-compromised
- ✘ Pulled Red Top tube of blood for serology to rule out VS and confirm this as a possible Contagious Ecthyma (Orf)



DIFFERENTIAL DX

- ✘ Contagious Ecthyma (Orf)
- ✘ Bluetongue ?????
- ✘ Rule out Vesicular Disease (VS, FMD, etc) given the reporting of the DVM, not because there was evidence of a vesicular disease



COMMISSURE OF THE LIPS LESIONS



COMMISSURE OF THE LIPS LESIONS



OCULAR DISCHARGE



NASAL LESIONS/DISCHARGE



DX

- ✘ Contagious Ecthyma
 - + VI positive (Orf)
 - + EM – Parapox particles observed
- ✘ Negative for FMD and VS



INFECTIOUS SKIN LESIONS IN FEEDER PIGS



BRIEF HISTORY

- ✘ 16 pigs purchased by students of a local HS
- ✘ 13 of 16 came from Indiana but thru another HS
- ✘ Purchased Sept - 1 pig died in first 2 weeks – no lesions – poor doer – no necropsy/vet exam
- ✘ Early November these pigs started with blisters in the ears – but still eating well
- ✘ Nov 6 pigs were taken by trailer (not unloaded) to County Fair tagging. Were in trailer for 7+ hours.
- ✘ Shortly there after the skin lesions became much worse
- ✘ Ag teacher thought it was mostly a mosquito issue.
- ✘ White pigs affected – Dark pigs unaffected



BRIEF HISTORY (CONT)

- ✘ DVM called due to the number of affected pigs
- ✘ DVM suspected Pox virus and called Dr. Jeter to request diagnostic assistance



CLINICAL EXAMS

- ✘ All white pigs (13 of 16) were affected. All affected pigs and were from Indiana
- ✘ All black pigs (3 of 16) were unaffected. On further investigation, the 3 pigs came from a local breeder in the county and were acquired later than the pigs from Indiana
- ✘ Lesions start out as edematous raised spots that become inflamed, then dry and become crusty. Lesions are pruritic and results in secondary attacks from insects



VISUAL EXAMS



VISUAL EXAMS



VISUAL EXAMS



VISUAL EXAMS



UNAFFECTED PIGS



DIFFERENTIAL DX

- ✘ Swine Vesicular Disease
- ✘ Swine Pox
- ✘ Papular/Pustular Dermatitis
- ✘ Parakeratosis of swine
- ✘ Swine hypotrichosis cystica suis
- ✘ Demodicosis of swine



CONCLUSIONS

- ✘ Samples were negative for Pox virus
- ✘ Appeared like a Classical Pox virus
- ✘ Most likely was a pustular dermatitis compounded by insect vectors



AVIAN CASES IN WILD SPECIES WITH NEUROLOGICAL CLINICAL SIGNS



BRIEF OVERVIEW

- ✘ Wild Birds were brought to a Seabird Sanctuary by wildlife rehabbers for treatment
- ✘ Cormorants with neurological signs
 - + Paralysis in head and legs
 - + Unable to eat on their own
 - + Thick mucopurulent discharge from eyes
 - + Clinical signs did lead to deaths



POPULATION DYNAMICS

- ✘ The clinical birds were seen by the public and taken in by the rehabbers
- ✘ The sanctuary had 275 birds
 - + Primarily the population was seabird species
 - + The population was both resident species (75) and injured birds (200) that were being treated for possible return to the wild.
 - + The 200 birds were Brown Pelicans and Cormorants
 - + No clinical disease was observed in either groups



CLINICAL CORMORANT CASES

- ✘ These birds were brought to the hospital and sampled for diagnostic purposes.
- ✘ Strict biosecurity measures were in place to prevent transmission of disease between the hospital birds and the resident/rehab birds
- ✘ Once a Diagnosis was made, the facility euthanized the positive neurological cases and contact cases.
- ✘ All new cases were further isolated away from the hospital facility with additional biosecurity practices put into place
- ✘ All Cormorants were sampled upon intake and neurological cases were euthanized immediately



DIFFERENTIAL DIAGNOSIS

- ✘ Highly pathogenic avian influenza
- ✘ Fowl cholera
- ✘ Infectious laryngotracheitis
- ✘ Fowl pox (diphtheritic form)
- ✘ Coryza
- ✘ Psittacosis (chlamydiosis) (psittacine birds)
- ✘ Mycoplasmosis
- ✘ Infectious bronchitis
- ✘ Pacheco's parrot disease (psittacine birds)
- ✘ Management errors such as deprivation of water, air, feed









CONCLUSIONS

- ✘ Exotic Newcastle Virus but only was in wildbirds
- ✘ No transmission to resident birds at this facility due to the excellent biosecurity measures implemented by facility
- ✘ There are resident and migratory flocks of cormorants in Florida. The affected birds were felt to be from the migratory flocks.
- ✘ Recommendations: develop a surveillance plan for both migratory and resident cormorants to stay ahead of the impacts that this disease would have on Florida's diverse avian species industries (with the assistance of Florida Fish and Wildlife Conservation Commission)



AVIAN NEUROLOGICAL CASES (PIGEONS)



BRIEF HISTORY

- ✘ 6 weeks prior to my exam the owner admitted that another pigeon owner was allowed to enter while purchasing birds-
- ✘ 1 week later the younger birds in these cages (this area was primarily adult breeders) started with head tremors that progressed to head tilt then ataxia. Soon thereafter they were unable to stand and died
- ✘ Adult birds that became neurologic recovered
- ✘ Some birds also had ocular discharges and respiratory signs but this was an inconsistent clinical feature



HISTORY (CON'T)

- ✘ Outbreak took about 2 weeks to go from one end of this 75 foot length loft/house
- ✘ Outbreak appeared to disappear and at that point did not involve any of his other 3 lofts
- ✘ Two weeks after the first house cleared, a 2nd loft developed the same neurological clinical signs and shortly thereafter in 3rd loft.
- ✘ A week later the final loft (200 ft away) developed the same neurological clinical signs



BIOSECURITY MEASURES (LACK THEREOF)

- ✘ This owner did not have any footbaths nor did he practice any generally accepted avian species operational biosecurity measures
- ✘ Owner admitted that sometimes he would move birds from house to house
- ✘ Owner did use a face mask if he had birds with respiratory signs
- ✘ Most of this owner's birds were for food consumption but one loft was white pigeons used at weddings/events



DIFFERENTIAL DX

- ✘ Highly pathogenic avian influenza
- ✘ Avian Paramyxovirus
- ✘ Fowl cholera
- ✘ Infectious laryngotracheitis
- ✘ Fowl pox
- ✘ Coryza
- ✘ Psittacosis (chlamydiosis) (psittacine birds)
- ✘ Mycoplasmosis
- ✘ Infectious bronchitis
- ✘ Pacheco's parrot disease (psittacine birds)
- ✘ Management errors such as deprivation of water, air, feed





Birds sitting with ruffled feathers



Ruffled feather and tail drop



Torticollis and Ataxia



Biosecurity measures??

DIAGNOSIS

- ✘ Avian Paramyxovirus
- ✘ This was actually the second outbreak of this virus at this premise (3 years previously), but the clinical picture was somewhat different than the first outbreak
- ✘ First outbreak was due to allowing someone to keep pigeons to a pen adjacent to his birds. He evicted them and all of the discussions about biosecurity were evidently forgotten or he did not make the connection that another bird owner could bring a disease causing agent in on his clothing or shoes.



QUESTIONS??

Thank You!

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