



**MAKING THE MOST OF YOUR FIELD
NECROPSY**

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**“YOU SHOULD NEVER LET A DEAD
BODY GO TO WASTE”**
-Dr. Mary Smith



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ATTIRE



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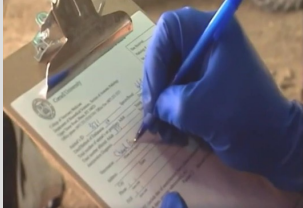
DIAGNOSTIC SPECIMEN SUPPLIES



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TOOLS & EQUIPMENT



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FIELD NECROPSY TIPS

- Document a complete history
- Thorough external visual exam- eyes, ears, nose, muzzle, joints, feet, mammary gland (express milk), skin, vulva/rectum
- Take photos (ID tag) and send them to the lab
- Collect a full set of samples!

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FORMALIN FIXED SAMPLES


FIX EVERYTHING!

- Histo S160 for field necropsy regardless of # of tissues


FIXED TISSUE SET

- Lung (section from each lobe)
- Liver (section from each lobe)
- Spleen
- Kidney
- Lymph nodes
- Forestomachs
- Jejunum, ileum, cecum and colon
- Skin
- Skeletal muscle
- Heart
- Brain
- Uterus
- Mammary tissue





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SAMPLE COLLECTION: HISTOPATHOLOGY



- Collect tissues \leq 1 cm thick for histo
- 1:10 tissue to formalin ratio
- Leak proof, non-breakable jar with wide mouth








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FRESH SAMPLES

- Fresh tissue set in individual containers, labeled
- Freeze until shipment



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SAMPLE COLLECTION: CULTURE (2 METHODS)

Tissue in sterile containers



Sear, then swab tissue



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AEROBIC CULTURE

1. Swab in Amies with or without charcoal or ATM; sear, stab, swab solid organ



- Chill

2. Piece of tissue

- Chill or Freeze




Amies with or without charcoal



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SEAR/STAB/SWAB TECHNIQUE FOR SOLID ORGAN CULTURE

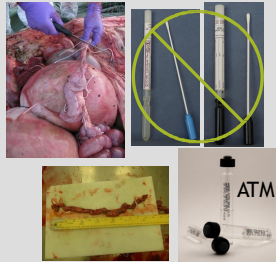


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ANAEROBIC CULTURE


1. Swab in ATM; sear, stab, swab solid organ
 - Room temperature
2. 3 cm cubed piece of tissue
 - Freeze
3. 8" tied off loop of intestine
 - Freeze, or swab in ATM



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SAMPLING INTESTINE FOR ANAEROBIC CULTURE




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NECROPSY


- Left lateral
- Reflect right limbs
- Cut from subcutaneous tissues
- Reflect skin, and partially reflect mammary gland



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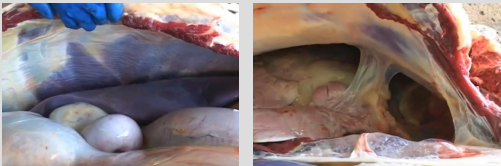
NECROPSY



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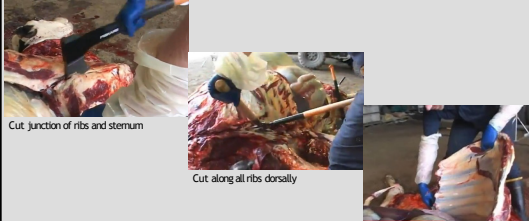
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ENTERING THE THORAX



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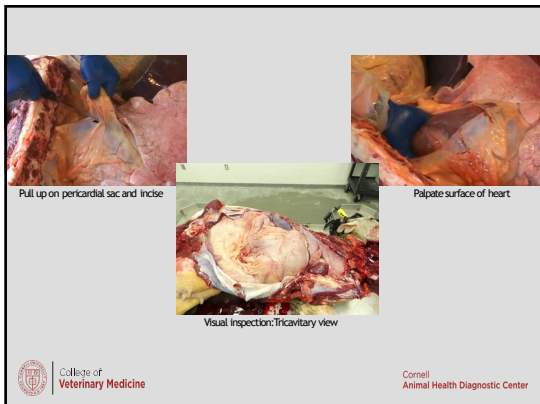
Cut junction of ribs and sternum

Cut along all ribs dorsally

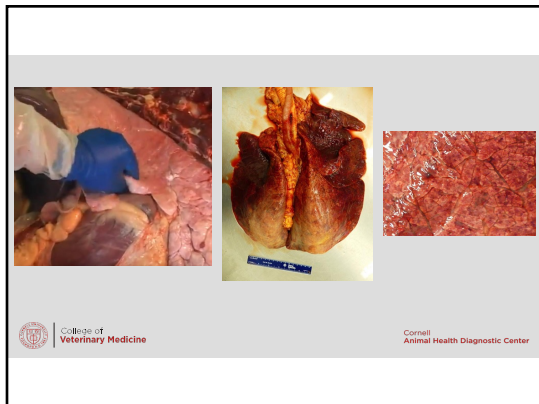
Remove entire rib plate; becomes your work surface for sample processing

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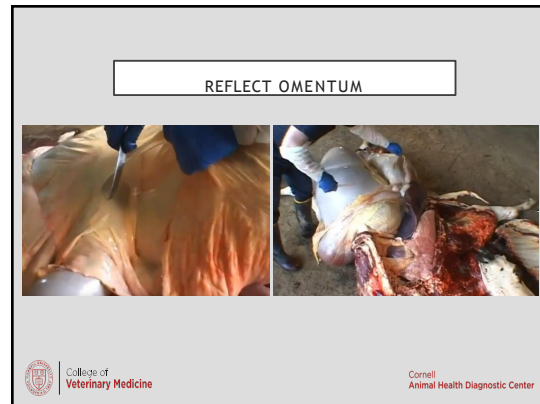
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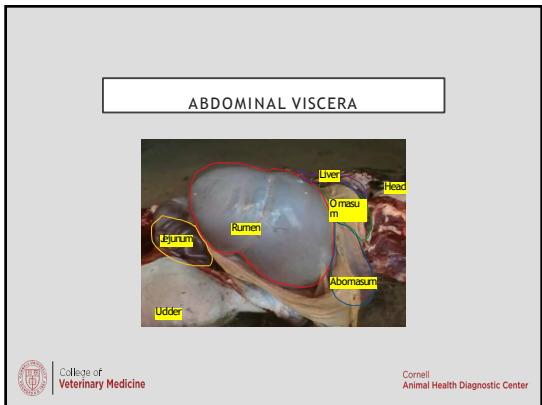
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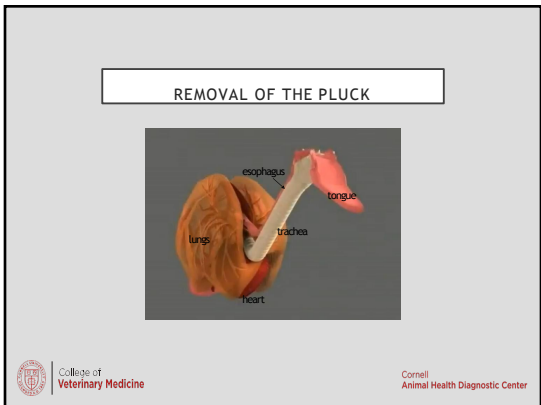
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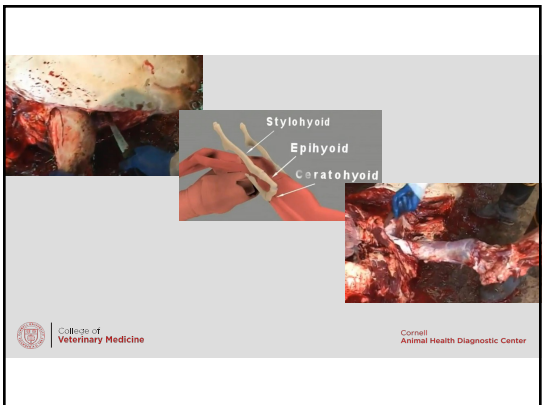
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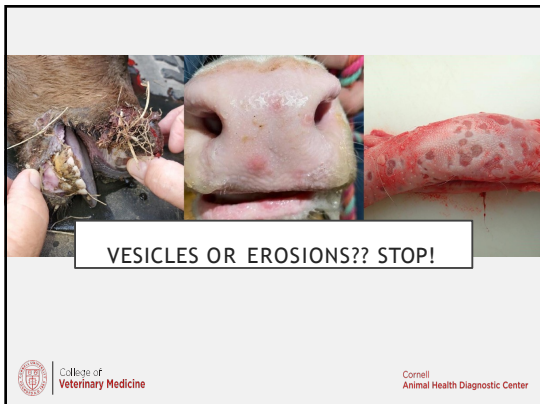
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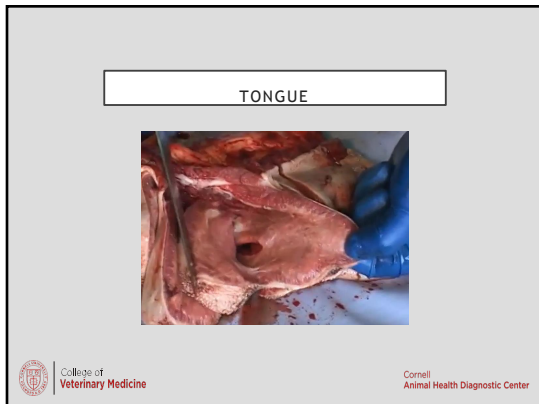
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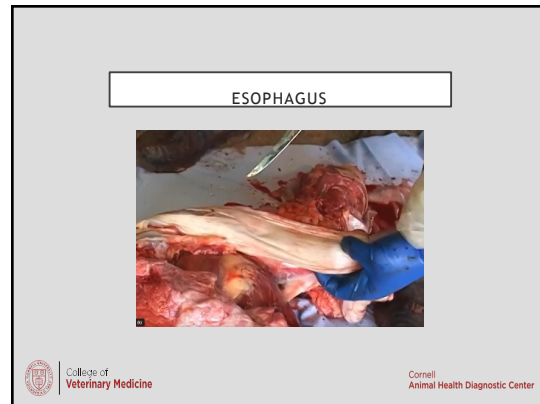
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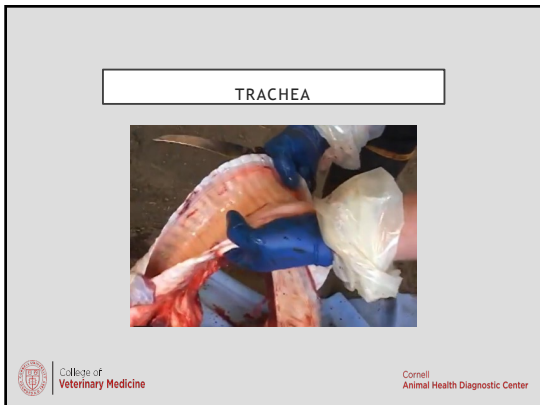
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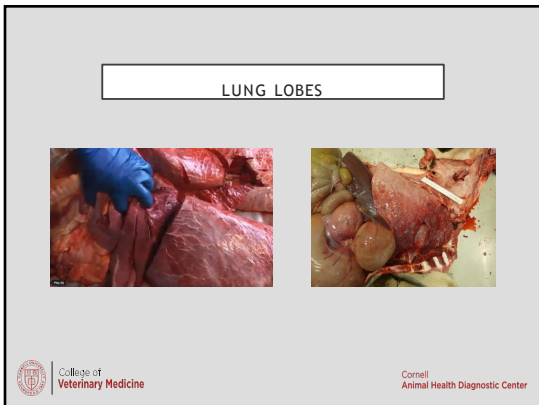
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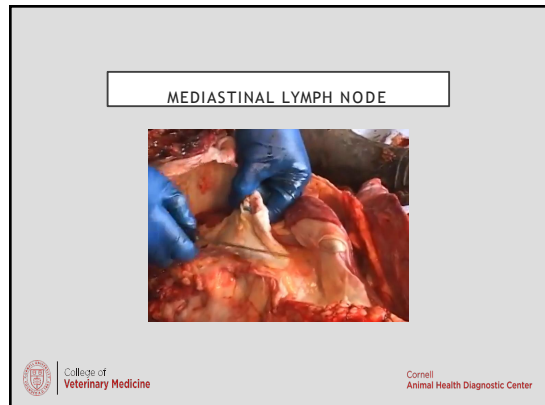
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RESPIRATORY WORK-UP: BACTERIAL

Samples	Differentials	Tests
<ul style="list-style-type: none">Lung	<ul style="list-style-type: none"><i>Mannheimia haemolytica</i><i>Pasteurella multocida</i><i>Histophilus somni</i><i>Trueperella pyogenes</i><i>Bibersteinia trehalosi</i><i>Mycoplasma</i> spp.<i>Salmonella</i> Dublin sepsis (neonate)Sepsis	<ul style="list-style-type: none">Aerobic cultureMycoplasma culture
<ul style="list-style-type: none">Lymph node, spleen, kidney		<ul style="list-style-type: none">Aerobic culture

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RESPIRATORY WORK-UP: OTHER

Samples	Differentials	Tests
<ul style="list-style-type: none">Lung	<ul style="list-style-type: none">BVDBRSVBHV1CoronavirusPI3	<ul style="list-style-type: none">PCR or FA for each (note: for BVD, intestine, spleen, or lymph node preferred)
<ul style="list-style-type: none">Colon contents	<ul style="list-style-type: none">Lungworm	<ul style="list-style-type: none">Fecal float
<ul style="list-style-type: none">Liver	<ul style="list-style-type: none">Selenium deficiency	<ul style="list-style-type: none">Selenium

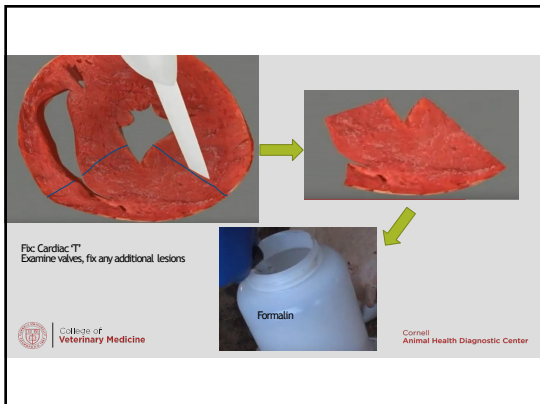
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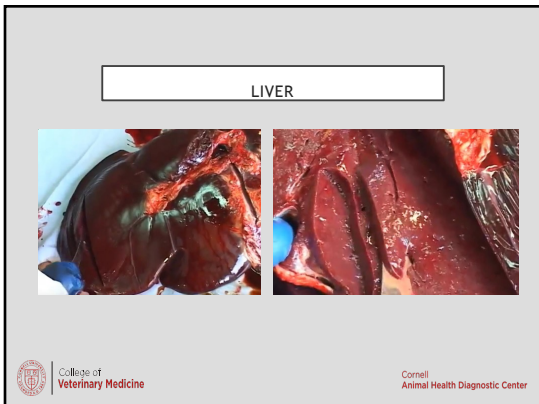
THE HEART

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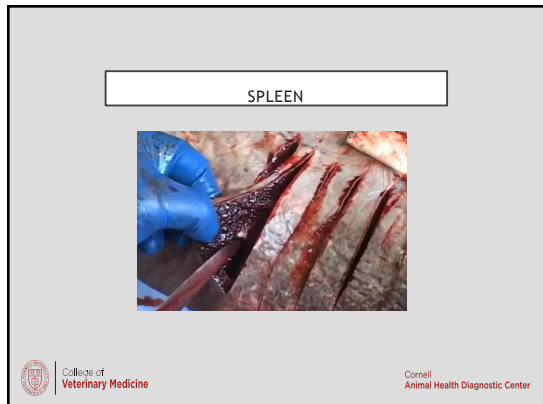
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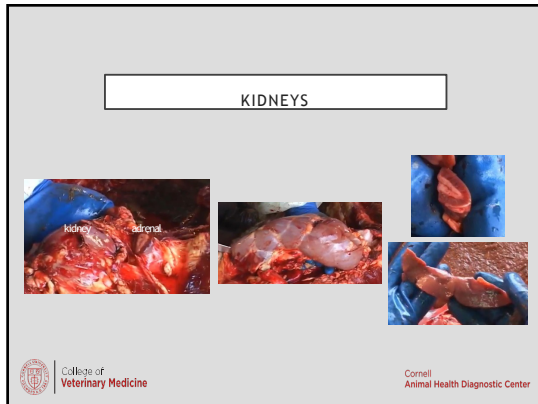
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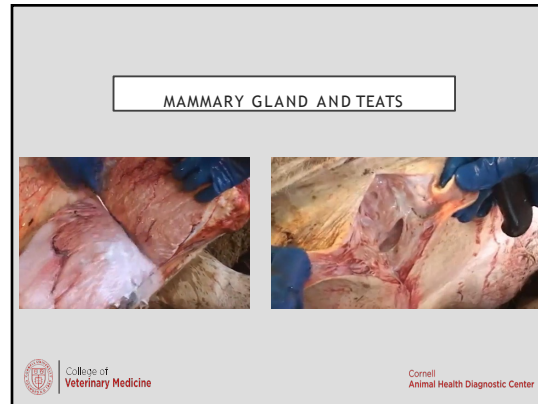
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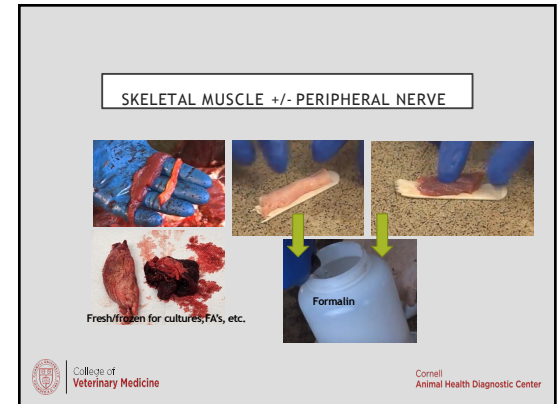
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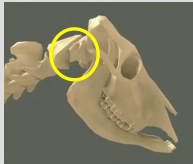
SUDDEN DEATH WORK-UP

Samples	Differentials	Tests
<ul style="list-style-type: none">Skeletal muscle (≥ 2 cm cubed)	<ul style="list-style-type: none"><i>Clostridium</i> spp.	<ul style="list-style-type: none">Anaerobic cultureHistotoxic Clostridial FA panel (C. chauvoei, novyi, septicum and sorbitilli)Fecal tox
<ul style="list-style-type: none">Colon contents	<ul style="list-style-type: none"><i>Strongylides papillosus</i>	
<ul style="list-style-type: none">Mammary gland	<ul style="list-style-type: none">Toxic mastitis	<ul style="list-style-type: none">Aerobic culture
<ul style="list-style-type: none">Lymph nodes, spleen, kidney	<ul style="list-style-type: none">Sepsis	<ul style="list-style-type: none">Aerobic culture
<ul style="list-style-type: none">Aqueous humour, urine, rumen contents, heart blood, colon contents, fresh and fixed tissues	<ul style="list-style-type: none">Suspected Toxicity	<ul style="list-style-type: none">Appropriate testing based on gross and histologic findings

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HEAD REMOVAL



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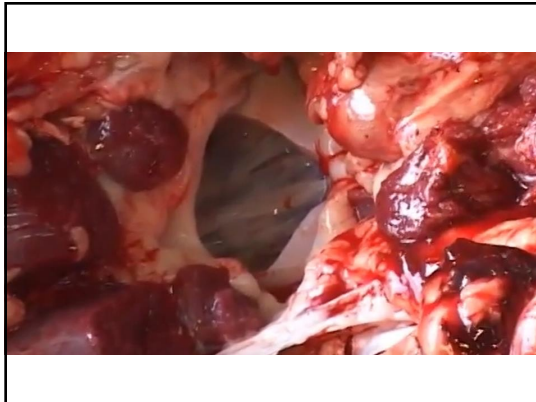
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HEAD REMOVAL

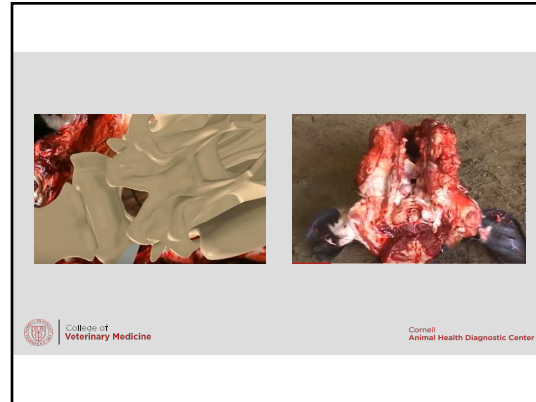


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AQUEOUS HUMOUR

- DO NOT send an entire eyeball fresh!
- Use 18-20 gauge 1" needle
- Pull off ASAP after death
- Red top tube
 - Refrigerate for:
 - Nitrates
 - Magnesium



The diagram shows a cross-section of an eye with labels: Cornea, Iris, Lens, Vitreous Chamber, Retina, Sclera, Choroid, and Optic Nerve. The photograph shows a red-top tube and a needle being used to collect fluid from an eye.

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BRAIN REMOVAL

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BRAIN REMOVAL

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BRAIN REMOVAL

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SAMPLING THE BRAIN: RABIES

Obex for BSE

Cerebellum and cerebrum sections for other tests

Rabies specimen

Remaining brain to be placed in formalin

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OTHER IMPORTANT BRAIN SAMPLES

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NEUROLOGIC DISEASE WORK-UP

Samples	Differentials	Tests
<ul style="list-style-type: none"> Brain (complete cross section cerebellum and brain stem) Brain stem Brain, swab of meninges Liver Brain (cerebrum) Liver or kidney 	<ul style="list-style-type: none"> Rabies Listeria monocytogenes Other bacterial meningitis/encephalitis Lead toxicosis Salt toxicosis Other heavy metal exposure 	<ul style="list-style-type: none"> Rabies virus FA Listeria culture Aerobic culture Lead quantification Mineral panel (to detect hypernatremia) Toxic heavy metal panel

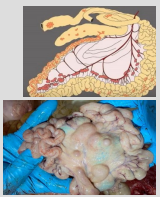
Note: that the diagnosis of polioencephalomalacia is made based on histologic examination of the brain

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SAMPLING THE GI TRACT


- Rumen (and contents)
- Reticulum (foreign objects? magnet?)
- Omasum
- Abomasum (ulcers? Hemorrhage? Neoplasia?)
- Lymph nodes and lymphoid aggregates



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SAMPLING THE GI TRACT



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TIED OFF LOOP OF BOWEL



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MESENTERIC LYMPH NODE



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GASTROINTESTINAL DISEASE WORK-UP

Samples	Differentials	Tests
<ul style="list-style-type: none">Tied off loops of bowel with contents (frozen)	<ul style="list-style-type: none"><i>Salmonella</i> spp., <i>Clostridium perfringens</i>, <i>Escherichia coli</i>	<ul style="list-style-type: none">Salmonella culture
	<ul style="list-style-type: none">Coronavirus, Rotavirus	<ul style="list-style-type: none">Anaerobic culture & C. perfringens Enterotoxin ELISA on contentsAerobic culture with E. coli genotyping PCRCoronavirus and Rotavirus FA or PCRBVD PCR
<ul style="list-style-type: none">Colon contents (NOT frozen)Colon contents or ileocecal junction	<ul style="list-style-type: none">BVDCoccidiosis, <i>Cyathostomum</i> spp.John's disease	<ul style="list-style-type: none">Fecal floatJohn's PCR or culture

Differentials & tests depend on age of animal

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GASTROINTESTINAL DISEASE WORK-UP: SEPSIS

Samples	Differentials	Tests
<ul style="list-style-type: none">Spleen, kidney, lung or lymph node	<ul style="list-style-type: none">Sepsis secondary to GI disease	<ul style="list-style-type: none">Aerobic culture


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ABORTION WORK-UP

Fetal Samples	Differentials	Tests
• Placenta, lung, abomasal contents	• Bacterial abortion (<i>E. coli</i> included)	• Aerobic cultures on each
• Kidney	• BHV1	• BHV1 PCR
• Lung	• BVD	• BVD PCR
• Placenta (or liver)	• <i>Campylobacter fetus</i>	• <i>Campylobacter fetus</i> FA
• Placenta and kidney	• Leptosporosis	• Leptospira PCR on each
• Fetal heart blood, or pleural/peritoneal/pericardial effusion	• BVD	• BVD SN (antibody)
	• Neospora	• Neospora IFA (antibody)

Collect a full set of fixed tissues for histology; fetal brain, heart and placenta important for dx of Neospora




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SUBMITTING SAMPLES TO A LAB

- History!
- Lesion severity
- Distribution
- Chronicity
- Anatomic location
- Suspected disease process
- Photos!
- Label all specimens—tissues, sites swabbed, etc.



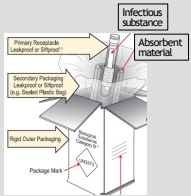
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SHIPPING SAMPLES

- Triple layer packaging (at minimum) is key!
- Must be leak-proof
- Absorbent material
- Rigid/durable





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AIR CARGO RATED CONTAINERS



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WHEN ASKED BY SHIPPING ATTENDANT:
"WHAT'S IN THE BOX?"

- DON'T SAY: Dead body, or a calf's body parts, etc... 
- DO SAY: 'Animal Specimens—Classified as Biological Substances Category B, UN3373' 

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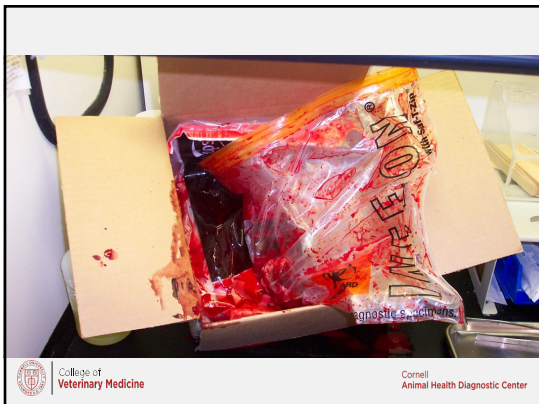
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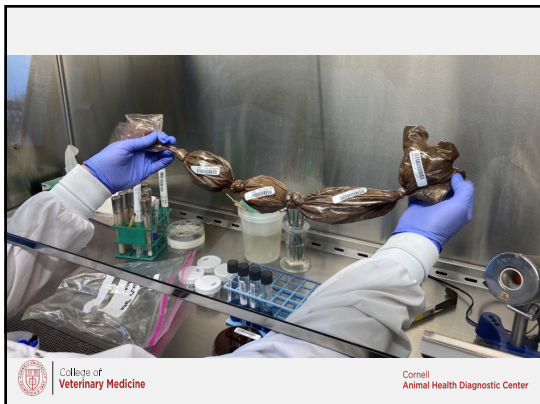
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SHIPPING SAMPLES


- ATM or other samples that should NOT be chilled: place in their own air cargo rated bag (to avoid contact with ice pack)

What else should NOT be chilled?
• Blood culture bottles
• Slides (blood smears)

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SHIPPING SAMPLES



Other fluid in tubes, fecal cups, Amies swabs


Tissues bagged individually & labeled; all bags placed in another sealed bag

All of these get placed into single large air cargo rated bag

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SHIPPING SAMPLES




That air cargo rated bag is placed in insulated pouch with freezer packs

The formalin jar get bagged with absorbent material; placed in box

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SHIPPING SAMPLES




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BOVINE NECROPSY VIDEO

- Cornell CVM, narrated live-action (Drs. Brad Njaa, Belinda Thompson)
- <https://www.youtube.com/playlist?list=PLz8RGKj10zTYTqLftbDM7a6WxChW7m>

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Questions?
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