

## AMERICAN FARMERS TO FEDERAL AVIATION ADMINISTRATION

October 10, 2104

- "Drones have great potential for mapping and assessing the health of crops and livestock so that producers can know how quickly they need to devote attention to those areas ."
- "We're behind the eight ball when it comes to places like Japan and Australia, which have been using drones in agriculture since the 1980s," said R.J. Karney, director of congressional relations for the American Farm Bureau.



## CSIRO : AUSTRALIA

- Locating cattle / sheep with unmanned aerial vehicles (UAV)
- CSIRO is working to develop, test and demonstrate thermal remote sensing technology on an Unmanned Aerial Vehicle to identify the location of livestock in extensive rangelands. By using a UAV platform, cattle can be located across very broad areas to assist producers in improving the efficiency, and reducing the cost, of mustering often done by helicopter at great expense.








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### Traffic Surveillance I

The Traffic Surveillance Drone project has received initial funding from the Georgia Department of Transportation and the Federal Highway Administration's Priority Technology Program.

The drone is currently under construction at the Georgia Tech Research Institute's Advanced Vehicle Development and Integration Laboratory.



A DRONE  
CAN DO  
THIS

# YAMAHA R- 50 JAPAN HAS AN ADVANCED PROGRAM



In 1983, Yamaha Motor Company received a request to develop a unmanned helicopter for crop dusting purposes from the Ministry of Agriculture, Forestry and Fishery of Japan. That began initial research and development efforts that led to the completion of the Industrial-use Unmanned Helicopter "R-50" in 1987.



Whilst research and development efforts in the field of industrial-use unmanned helicopters was being carried out around the world, the Yamaha R-50 with its payload of 20 kg was the first practical-use unmanned helicopter for crop dusting.



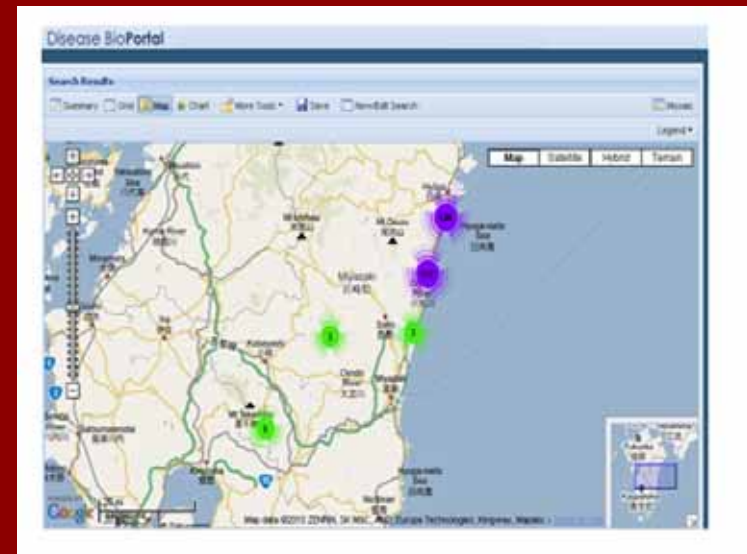


# MERGE THE OLD AND THE NEW VETERINARY EPIDEMIOLOGY

- Old fashioned  
animal disease  
detective work



- MODERN IT  
SUPPORT



There has to be a better way  
Eventually the first thing I  
Looked for on the sheep farm was a dog

FMD UK 2001 sheep surveillance

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I COULD HAVE USED A DRONE HERE

# Dr. T. Wilson UK FMD 2001 farm visits



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ON FARM SURVEILLANCE:  
NEEDS TO BE A BETTER WAY  
I RODE IN THE MANURE BUCKET

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# HOW TO CONDUCT A TAD / FAD FIELD INVESTIGATION: THE TWELVE (12) STEPS







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## FAD TAD INVESTIGATION Objectives

- Provide a veterinary medical assessment that consists of the following:
  - Differential diagnosis;
  - Classification of investigation, which is necessary to rank and prioritize the differential diagnosis in terms of the magnitude of suspicion for a TAD / foreign animal disease, in relation to the magnitude of suspicion for an endemic disease or condition;
  - Designation of diagnostic sample priority, which is necessary to rank and prioritize the speed at which diagnostic samples are to be collected, transported, and tested; FADD, AVIC, SAHO must agree on sample priority.

# Personal Protective Equipment (PPE)



You are Responsible for:

1. Taking Precautions to Prevent Disease Transmission
2. Determining the Likelihood of Zoonotic Disease
3. Use of Appropriate PPE



# Personal Protective Equipment Decision Tree



What is level of  
zoonotic  
risk to  
individual and  
community?

## Category I Risk: Limited

- Respiratory protection (can range from none to N-95)
- Coveralls & boots
- Gloves
- Disinfectant

### Examples

ASF  
FMD  
RCV



## Category IIA Risk: Moderate

- N-95 to PAPR
- Coveralls & boots
- Gloves
- Eye protection
- Disinfectant

### Examples

Anthrax  
BSE  
Encephalitis  
Glanders  
Hantavirus  
HPAI  
WNV  
Unknown Zoonosis (??)



## Category IIB Risk: Serious

- PAPR or SCBA
- Double gloving
- Water-resistant, washable, or disposable coveralls and boots
- Cut resistant gloves
- Tape
- Apron (cut resistant)
- Disinfectant

### Examples

Hendra  
Nipah  
Q-fever  
RVF



# How do you determine PPE



- Suspected Disease Agent
- Mode of Transmission; Airborne, Parenteral, Ingestion, etc.
- Availability of Vaccine / Treatment
- Infectious Dose
- Use of PPE Decision Tree to Determine Proper PPE
- In an outbreak situation this will be determined by the safety officer

# PPE

- Latex Gloves
- Thick Rubber Gloves
- Cut Resistant Gloves
- Waterproof Coveralls, Hood, Hair Cover
- Respirator, Powered Air Purifying Respirator (PAPR)
- Goggles, Face Masks
- Rubber Boots, Boot Covers
- Cut Resistant Apron
- Ear Plugs



## Clinical Comparisons: Snouts

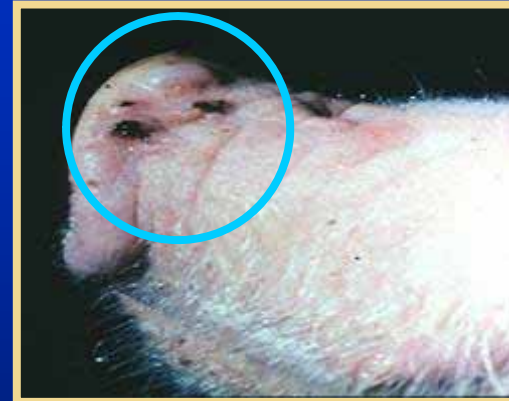
Accurate , timely sampling is always required

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### ■ Swine Vesicular Disease



### ■ Foot and Mouth Disease



### ■ Vesicular Stomatitis



### ■ Vesicular Exanthema

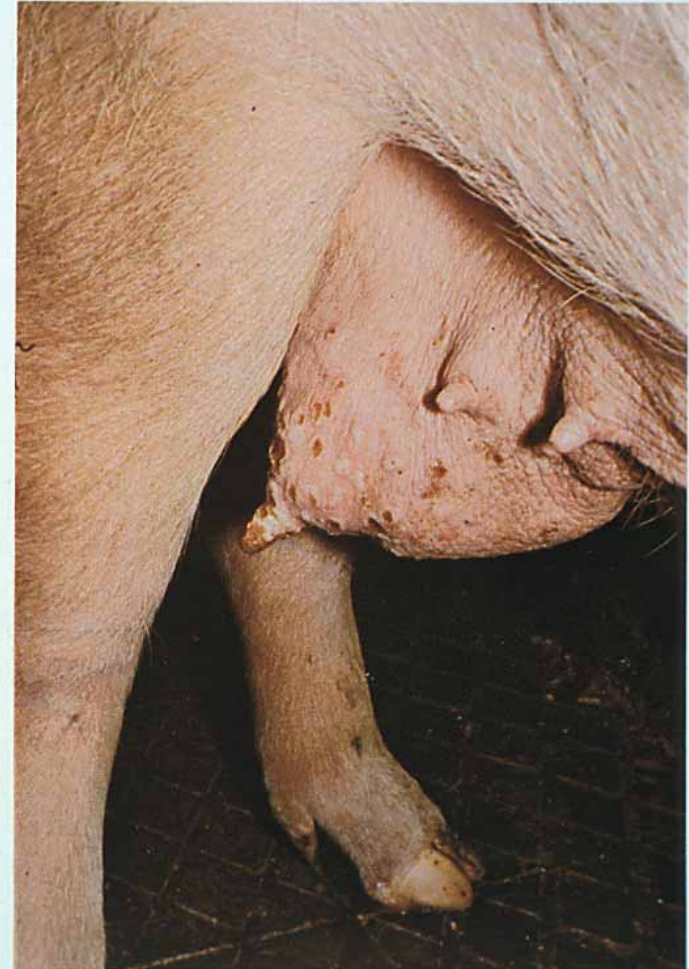




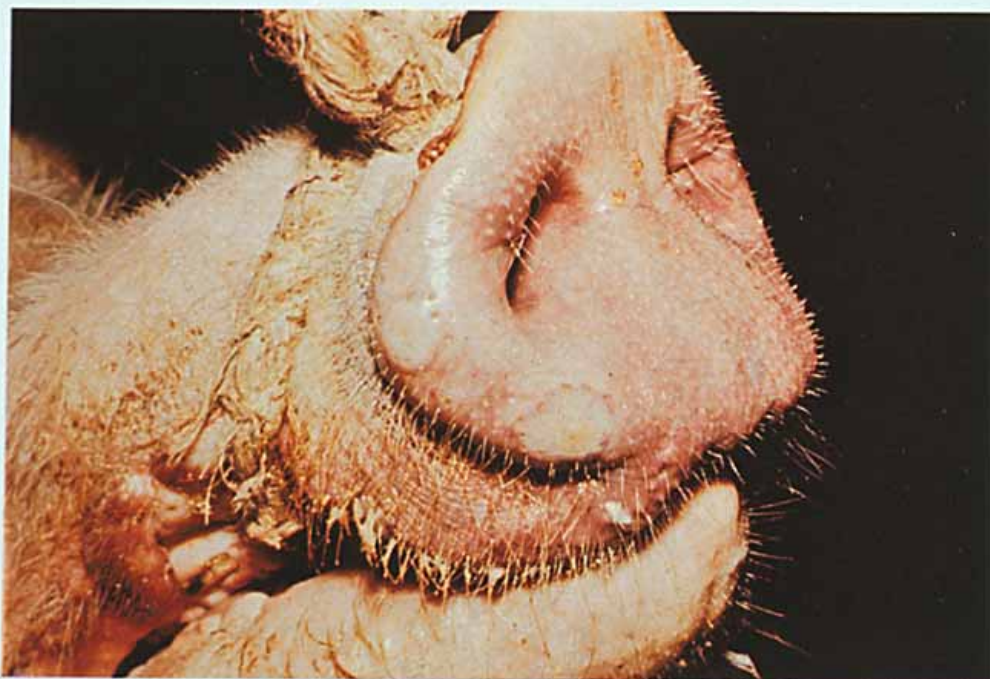
*PLATE 32: SWINE VESICULAR DISEASE  
DERMATITIS*

The several pale, slightly raised plaque like lesions on the udder proper and the teats are areas of epithelial degeneration and necrosis. Several have a brownish red, cratered center of ulceration remaining after the epithelium had sloughed. This was a natural case of swine vesicular disease. One has to differentiate this lesion from other viral diseases making similar lesions such as foot-and-mouth disease, vesicular exanthema and vesicular stomatitis.

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*PLATE 31: SWINE VESICULAR DISEASE  
DERMATITIS*

These two opaque plaque like vesicles on one side of the snout are the early lesions of degeneration and necrosis in the epithelium caused by the virus. Similar lesions may be seen on the udder and in the interdigital spaces. With time, they will slough centrally leaving a central reddened ulcer and a peripheral zone of opaque, swollen epithelium. A nonsuppurative encephalitis with a fairly characteristic partial wall necrotizing vasculitis with many neutrophils is commonly observed and was seen in this natural case of swine vesicular disease.

# Differentials for Vesicular Diseases in Cattle

- Foot and Mouth Disease
- Vesicular Stomatitis Virus
- Infectious Bovine Rhinotracheitis
- Bovine Virus Diarrhea
- Malignant Catarrhal Fever
- Epizootic Hemorrhagic Disease
- Trauma
- Papular Stomatitis
- Bovine Mammilitis
- Primary Thermal Injury – Sun Burn
- Photosensitization Dermatitis – secondary thermal injury ( Mold Toxicities, Lantana Poisoning, Clovers, etc)
- Chemical Burns
- Rinderpest
- Bluetongue Virus
- Foot Rot
- Trauma





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# Vesicular Diseases

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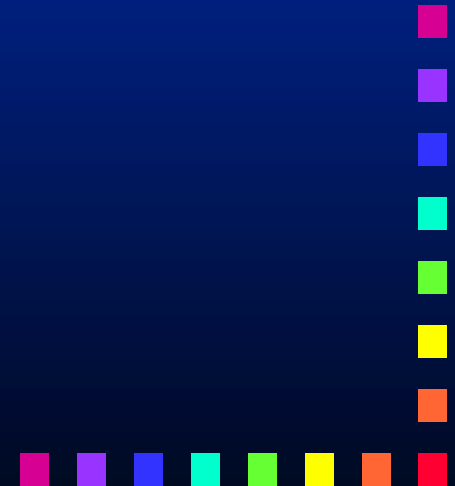
*Remember :*  
all vesicular diseases look alike

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# YOU MUST SAMPLE

Repeat: you must sample

If you can read this YOU MUST SAMPLE



# SAMPLES: BETTER TO HAVE MORE THAN LESS

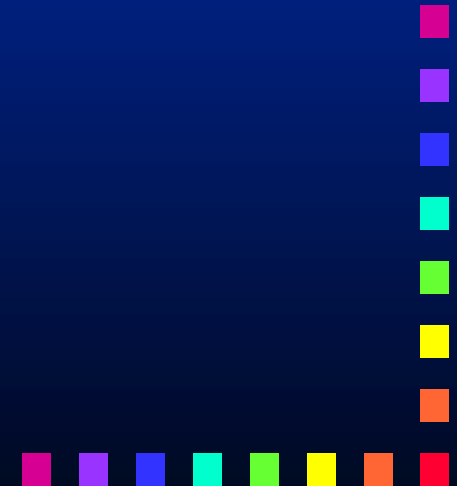
- The lab can always hold, later discard



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# TAIWAN FMD SAMPLES SENT TO PLUM ISLAND

- CHINA AIR
- CHINA AIR CUSTOMS
- SENT BY ME
- 25-35 SAMPLES
- ABOUT 10 SAMPLES HAD NO VIABLE VIRUS.
- I WAS SHOCKED



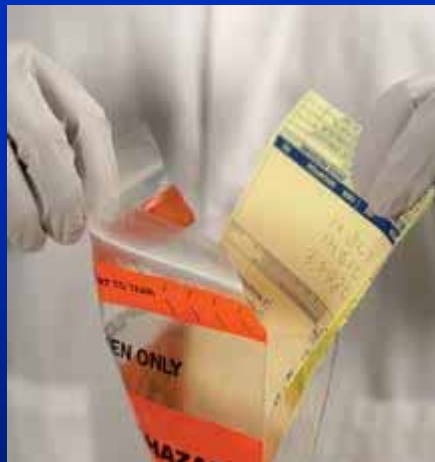


# Foot and Mouth Disease



Taiwan, 1997

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ON ARRIVAL AT PLUM ISLAND  
ABOUT 10/35 SPECIMENS WERE NONVIABLE



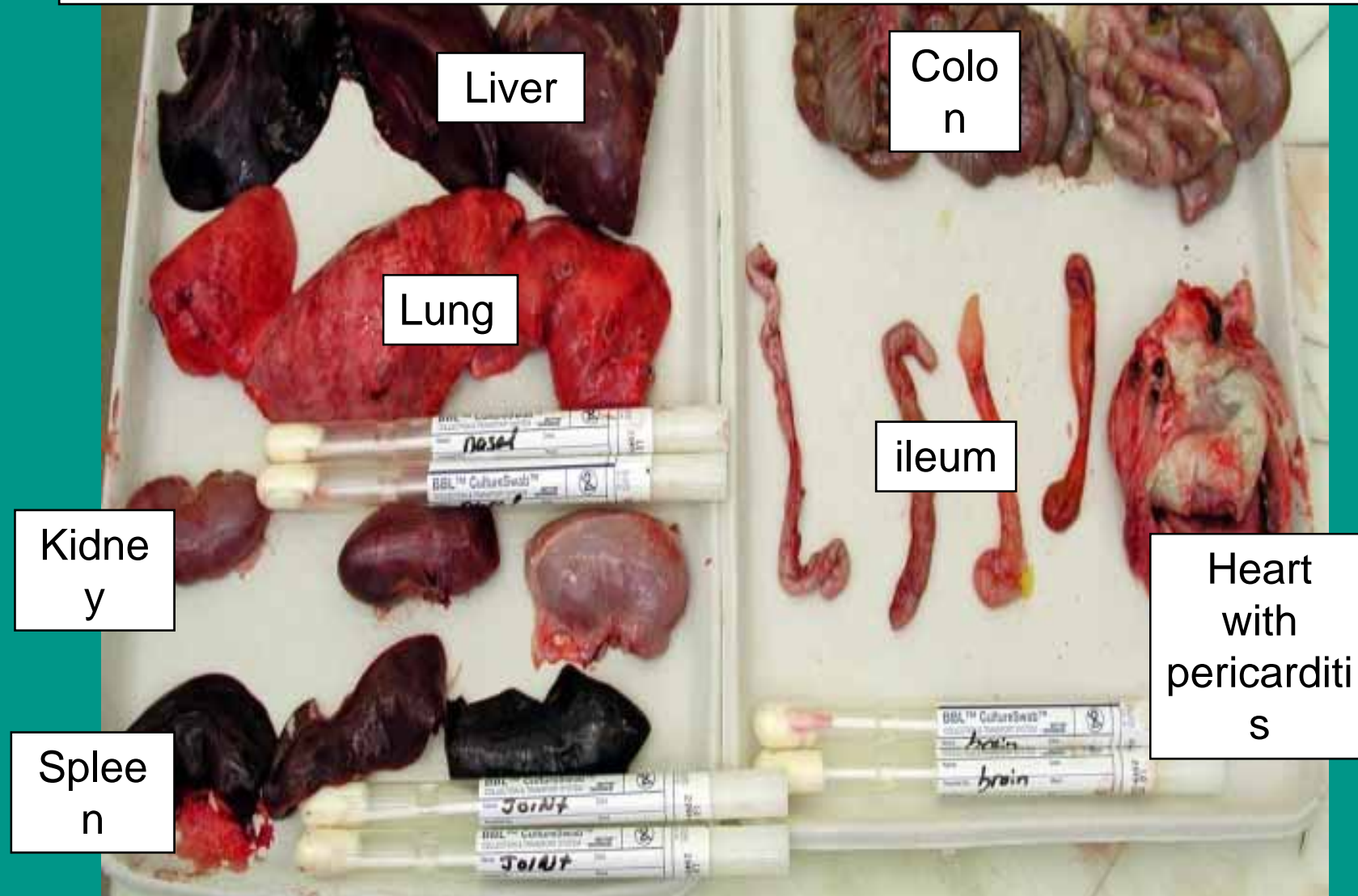
# Sample Collection

- Collect Proper Samples !
- Collect the Appropriate Number ,Type of Samples for each Lab- Virology, Bacteriology, Toxicology, Pathobiology\*



Safeguarding Animal Health

## Submission for a multisystemic disease investigation

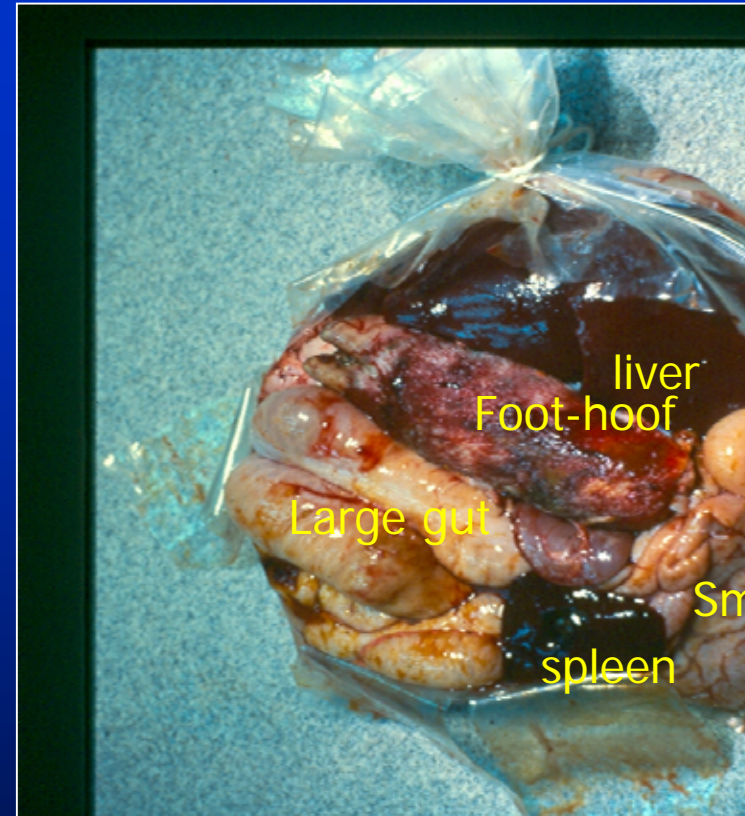




## Improperly Shipped Lab Samples

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YES: THE LAB WANTS SAMPLES. OK. Let's send them a little bit of everything in ONE BAG ! We must be sure not to forget a sample. The more the better ! Put it in one bag so it does not get lost !





Improperly Shipped Lab Samples: ONTARIO Veterinary College  
necropsy room: circa 1970



# Improperly Shipped Lab Samples



Specimen collection: constant , important process throughout disease investigation.



Taiwan - Hog Numbers - Pre FMD



Taiwan FMD

1997

Taiwan central mountain range



Taiwan FMD sample collection 1997

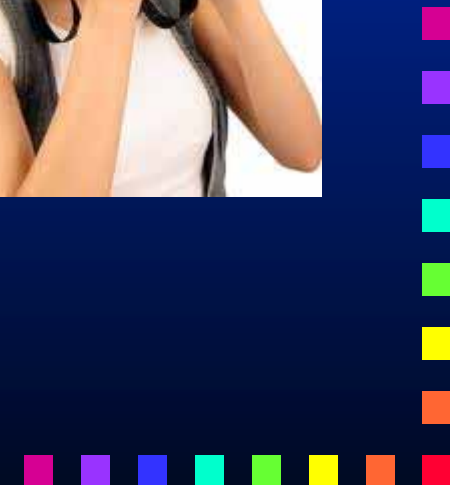




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## DIGITAL PHOTOS CAN ASSIST POLICY MAKERS

- DIGITAL PHOTOS OF HIGH PRIORITY CASES CAN BE ELECTRONICALLY SENT TO LAB AND ADMINISTRATION STAFF.





- ENCOURAGE TAD SUSPECT CASES DIGITAL PHOTOS
- ABOUT 50% OF THE SUSPECT FIELD TAD INVESTIGATIONS NOW HAVE DIGITAL IMAGES INCLUDED
- DIGITAL IMAGES STRONGLY ENCOURAGED