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## **Regional Laboratory Updates: Guidelines for Sample Collection, Submission, and Transportation for Foot-and-Mouth Disease Virus Surveillance**

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# TOPICS:

**Sample  
Collection**

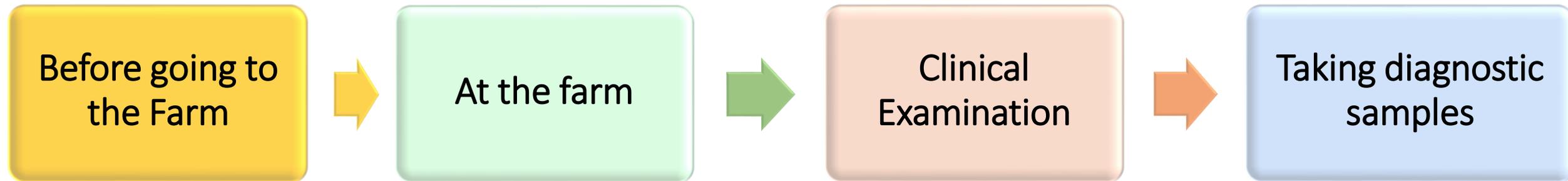
**Submission**

**Transportation**

- ✓ Outbreak investigation – diagnosis of FMD in suspected cases or possible contacts
  - ✓ Serological surveillance programs to estimate prevalence of disease in an endemic setting
  - ✓ Serological surveillance programs to demonstrate freedom from FMD infection or transmission
  - ✓ Post-vaccination monitoring
  - ✓ Research purposes
- ❖ That is essential to follow proper procedures for an accurate diagnosis of FMD, as it helps in controlling and protecting against the disease.

# ❖ Sample Collection

- A comprehensive guide for conducting clinical examinations and collecting samples for investigations related to Foot and Mouth Disease (FMD).

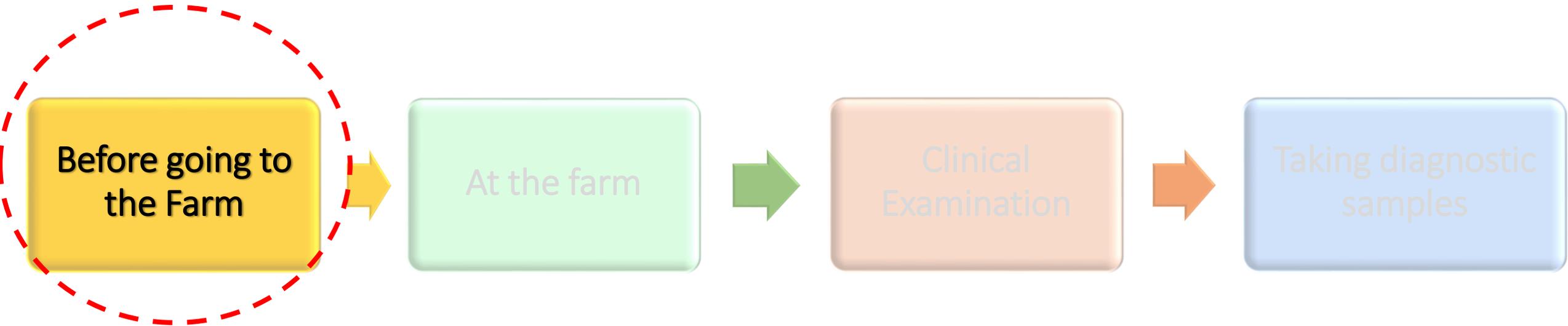


<https://youtu.be/bVwgS5USvic>

Ref; <https://www.youtube.com/@EUFMD>

# ❖ Sample Collection

- A comprehensive guide for conducting clinical examinations and collecting samples for investigations related to Foot and Mouth Disease (FMD).



# ❖ Sample Collection

- ✓ Why are samples collected?
- ✓ What equipment is needed?
- ✓ Which samples to take and when?
- ✓ Sampling Plans

## Before going to the Farm

Recording equipment.

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Biosecurity equipment

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Sampling equipment

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Animal handling equipmen

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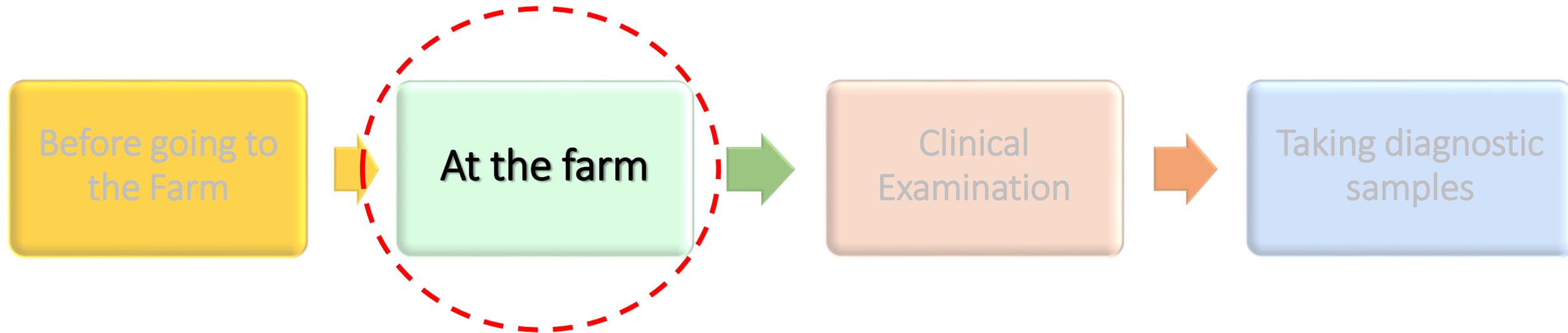
Manual 7

### Sample collection and transport



# ❖ Sample Collection

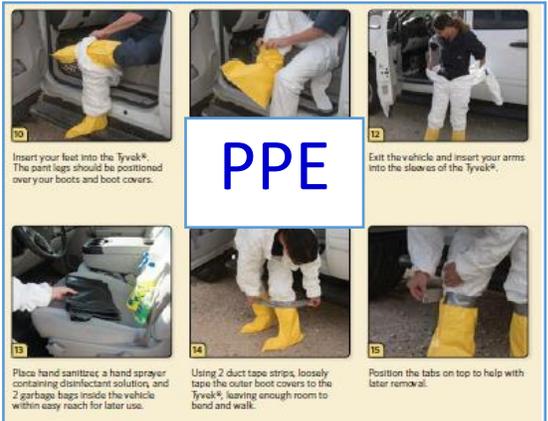
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# ❖ Sample Collection

## At the farm

Are any animals lame, drooling, not eating?



How many are affected?

When did this start?

✓ **Good Biosecurity;** Ensure good biosecurity: do not spread FMD further.

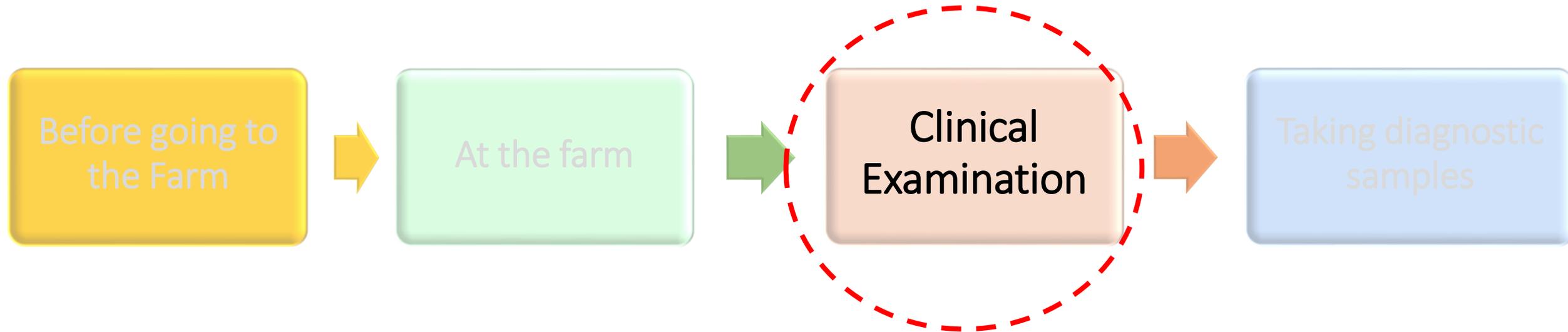


“Talk to the farmer”



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# ❖ Sample Collection

## Clinical Examination

Observe the animal: is it lame or salivating?

Physical Exam.; Open the mouth, look at the tongue and dental pad

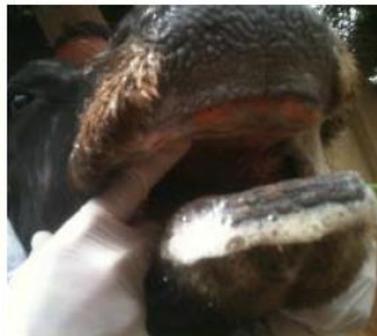
Lift the feet, check the interdigital space

Take the temperature of each animal

Examine the likely sites of vesicles thoroughly - muzzle, mouth, feet including the interdigital space (clean off dirt) and udder

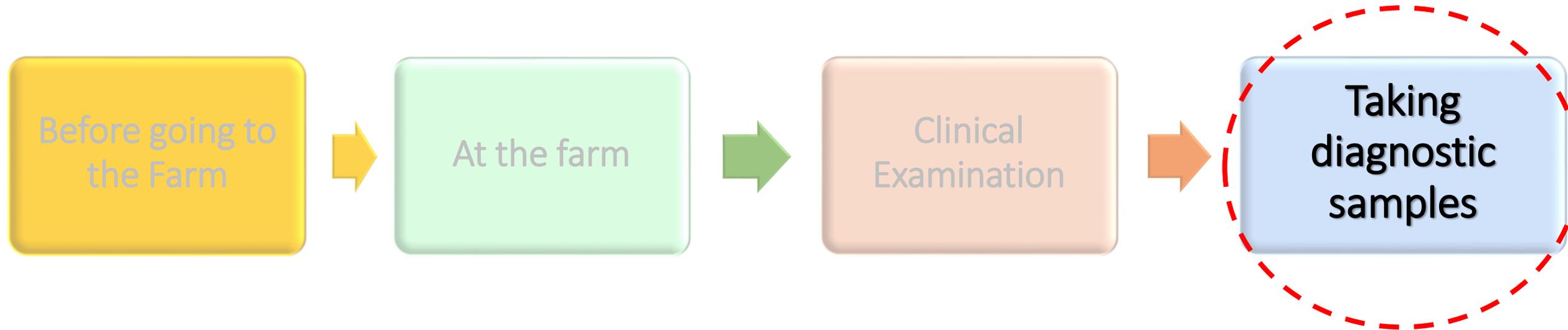
Enquire about milk yield if appropriate

Record your findings for each animal, including animal identity number.



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# ❖ Sample Collection

## Taking diagnostic samples



Fresh lesions



Figure 7: A buffalo being restrained using a permanent halter for blood sampling in Myanmar (photo: Polly Smith)

A fingernail-sized piece of lesion epithelium  
(Isolation buffer; glycerol and 0.04M PBS, 50/50 mix, pH 7.4 )

Take vesicular fluid if available.

Take a blood sample; affected animals.



- ✓ Carefully label all samples
- ✓ Take at least 6 epithelium samples and 20 blood samples, or all animals present if less than 20.
- ✓ Epithelium from a fresh lesion is the best sample

# ❖ Sample Collection

## ■ Checklist before leaving farm:

- Written records of what was found?
- How many animals had FMD lesions? How many animals on farm? How many were vaccinated?
- Fresh lesions found? At least 6 samples of fresh epithelium taken (if available)?
- Can each sample be linked to the written clinical findings for each animal?



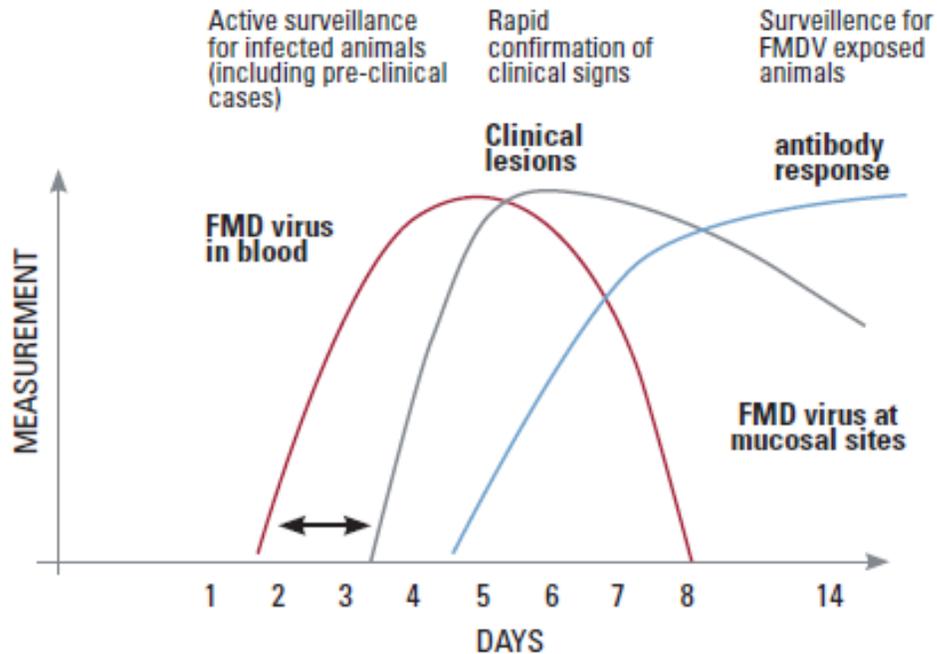
Figure 4: an un-ruptured vesicle in the interdigital space  
(The Cattlesite)



Figure 2: A ruptured vesicle on the tongue of a cow.  
(Photo: Emma Roffey, Mekong Livestock Research  
<https://mekonglivestock.wordpress.com/photos/>)

# ❖ Sample Collection

## ❖ Which samples to take and when?



**Figure 1:** This graph indicates the presence of virus in different tissues or fluids in an animal infected with FMDV and the presence of antibodies, relative to the onset of clinical signs (Paton and King (date unknown)). The type of testing applied at different times in the course of infection is indicated at the top of the graph

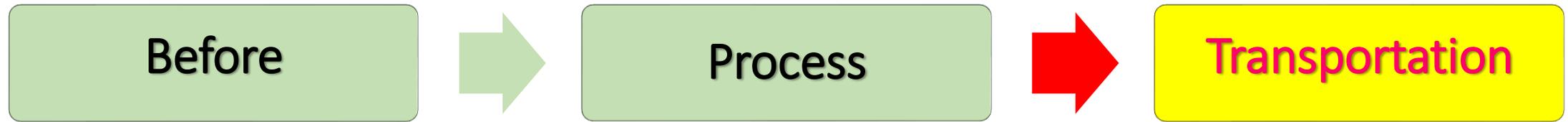
## ❖ Sampling Plans

- ✓ FMD-free country or zone (without vaccination)
- ✓ FMD-free country or zone (with vaccination)
- ✓ FMD-endemic country

## ❖ Lesion Ageing

Day of Clinical Disease	Appearance of lesion
Day 1	Blanching of epithelium followed by formation of fluid filled vesicle.
Day 2	Freshly ruptured vesicles characterised by raw epithelium, a clear edge to the lesion and no deposition of fibrin.
Day 3	Lesions start to lose their sharp demarcation and bright red colour. Deposition of fibrin starts to occur.
Day 4	Considerable fibrin deposition has occurred and regrowth of epithelium is evident at the periphery of the lesion.
Day 7	Extensive scar tissue formation and healing has occurred. Some fibrin deposition is usually still present.

# ❖ Submission



## BEFORE:

- ❖ FMDV can be destroyed by heat and acid, so proper handling of samples is crucial for successful identification and isolation in laboratory approaches.
- ❖ At a pH below 6.8, the FMD virus capsid can be disintegrated, rendering it non-infectious.
- ❖ Samples must be stored at neutral pH and kept cool at temperatures ranging from -20 to +4 °C.

# ❖ Submission

## Processing: Preparing

Which laboratory?

Provide the information to veterinary officers

Clarify information about sample collection and submission requirements

Details of requirements for packaging and labelling for transportation to the laboratory

# ❖ Submission

## Processing:

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### Labelling

- Date of sample collection

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- Sample number, that can be linked to more detail that is included on the submission form, such as animal ID etc)

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- Type of tissue (eg epithelium, vesicular fluid, blood)

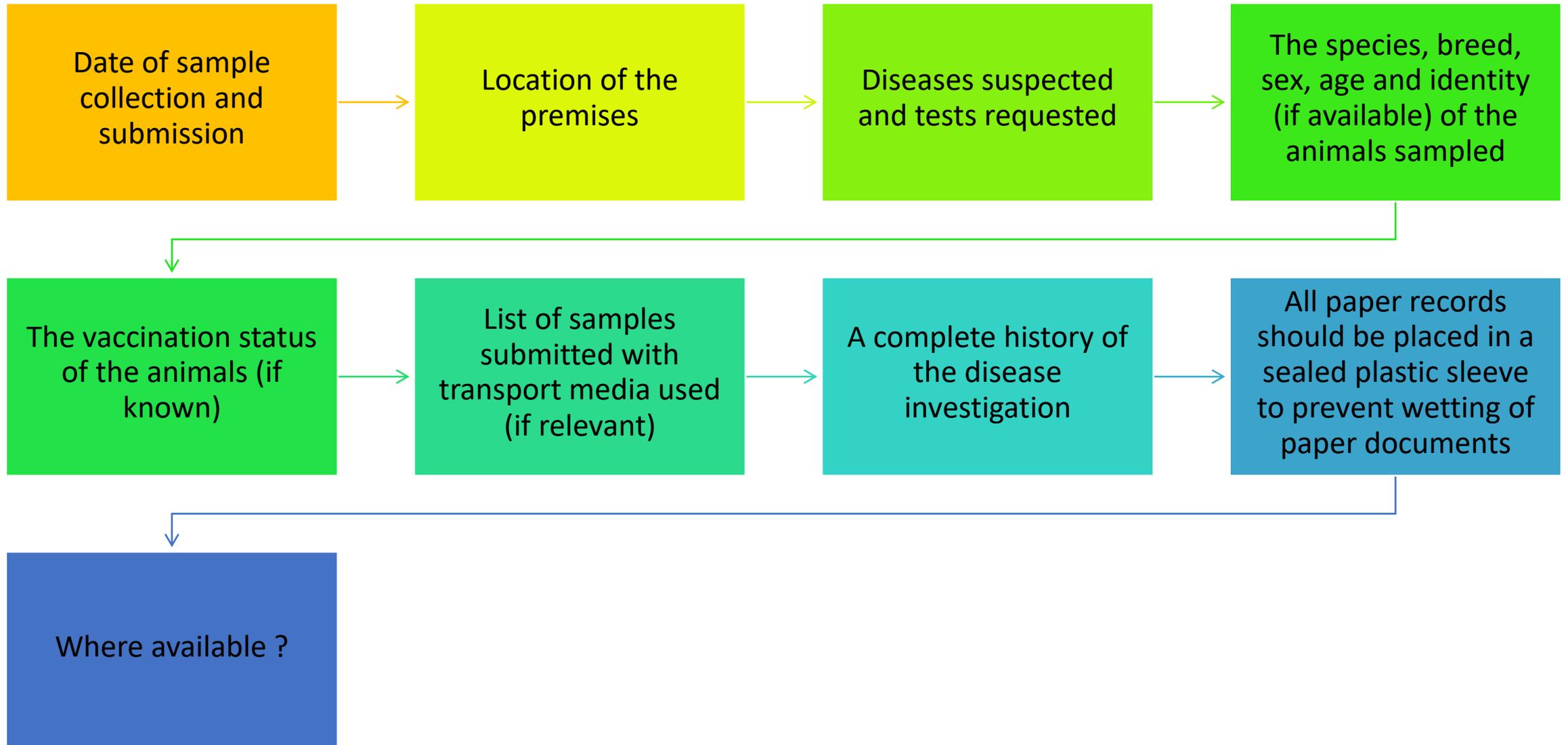
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- All labelling of the sample should be made in indelible ink

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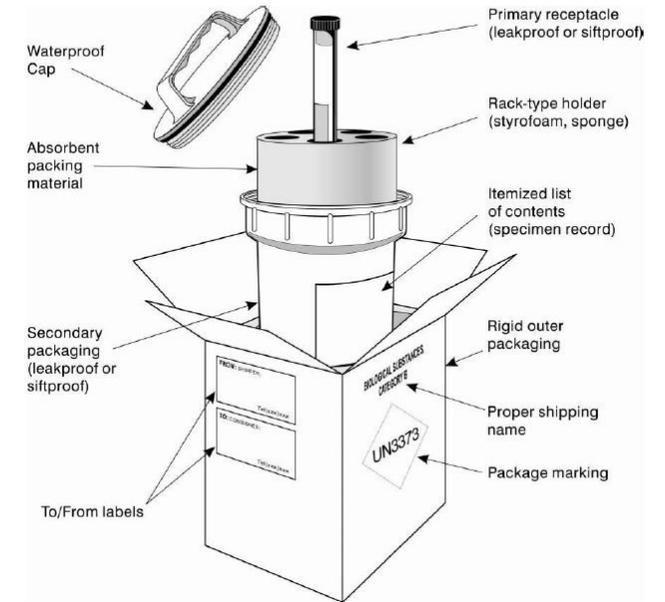
# Submission

## Processing: submission Form



# ❖ Transportation

- ✓ Packaging and dispatch of materials to laboratories
  - ✓ International Air Transporters Association; [IATA regulation](#)
    - ✓ Sample collection and primary containers
    - ✓ Primary container
    - ✓ Secondary packaging
    - ✓ Sufficient information and a list of samples
    - ✓ If freezer box is put outside the secondary packaging
    - ✓ If dry-ice is used for packaging, it must be placed outside the secondary packaging.



# ❖ Transportation

- ✓ **Route transportation**

- ✓ **Car Transportation:** Its depend the purposed

- ✓ **Airfreight direct:** provide details of the airway bill number, flight number and time and expected date of arrival of the package

# ❖ Transportation

## ✓ Labelling

- ✓ The name of submitter and address of institute submitting the samples
- ✓ Contact telephone numbers
- ✓ Infectious substance hazard label as appropriate
  - ✓ Biological materials fall into the following categories:
    - ✓ Infectious substances
      - ✓ Category A infectious substances (UN 2900) – 50 ml max volume
      - ✓ Category B infectious substances (UN 3373)
- ✓ Flight number and estimated arrival time
- ✓ Airway bill number
- ✓ Dry ice label (if necessary)

Thank you for your  
attention

