FOOT AND MOUTH DISEASE (FMD) POLICY AND MANAGEMENT PROTOCOL

DEPARTMENT OF VETERINARY SERVICES SARAWAK

MINISTRY OF FOOD INDUSTRY,
COMMODITY AND REGIONAL
DEVELOPMENT SARAWAK

DEPARTMENT OF VETERINARY SERVICES SARAWAK

DEPARTMENT OF VETERINARY SERVICES SABAH

This Foot and Mouth Disease (FMD) Management Policy is adapted from the *Polisi Pengurusan Penyakit Kuku dan Mulut* (FMD) of the Department of Veterinary Services Sabah to Sarawak's Regulations, legislative boundaries and workforce capacity .

Contingency, Preparedness and Prevention of FMD is a long-term commitment for both regions. As the Veterinary Authorities of these regions, we are committed to continually improve our knowledge, skills and competency to carry out this duty. This policy management protocol: Foot and Mouth Disease explains the standards, policies, objectives, goals and control strategies. We hope that all parties will use this policy as a guidance to achieve this goal.

Content

1: INTRODUCTION

Foot and Mouth Disease (FMD) is caused by an *Aphthovirus* from the *Picornaviridae* family that can infect animals such as cattle, buffalo, goats, sheep, pigs, deer and cloven-hoofed animals.

The incubation period of the FMD virus is 14 days. Clinical signs of the disease include lameness, drooling saliva, drastic reduction of milk production, sores between the hoof, vesicles on the surface of the tongue, gums, lips, mouth and teats. FMD can spread very rapidly through direct or indirect contact of infected animals during movement.

Infected livestock will show clinical signs or be subclinical while recovered livestock may become virus carriers. In addition, vehicles, clothes, shoes and equipment contaminated by the virus as well as livestock products from infected animals can also be the source of virus spread.

FMD is an important disease listed in the World Organisation for Animal Health (WOAH). FMD can cause economic losses to farmers as it causes decrease in livestock productivity and death in young animals. Sarawak and Sabah successfully maintain FMD disease-free status without vaccination by WOAH since 2004.

2: OBJECTIVES

a) Provide a uniform guideline to prevent FMD entry and to maintain FMD disease-free status without vaccination.
b) Outline strategies to control and eradicate FMD in the event of an outbreak.

3: DISEASE CONTROL STRATEGIES

FMD is a reportable disease under the Veterinary Public Health Ordinance (VPHO), 1999. In order to achieve the objectives of the policy, several strategies have been identified which are divided into two (2) main categories, namely prevention strategies carried out prior to an outbreak and management/control strategies if an outbreak occurs in Sarawak.

Prevention strategies include import control and quarantine, surveillance, declaration of FMD Control Areas and awareness campaigns. Five (5) divisions bordering Kalimantan namely; Kuching, Serian, Sri Aman, Miri and Limbang have been declared as FMD Disease Control Areas on the 14th June 2022 under Section 35(1)(b)to prevent the entry of FMD into Sarawak. The control measures include mandatory movement permits for FMD susceptible animals in and out of these divisions, intensified awareness, and surveillance for FMD.

While the disease control management strategies include disease reporting, emergency vaccination, disposal of livestock, zoning (Infected Zone, Control Zone & Free Zone), movement control of livestock movement and animal products, slaughter control, disinfection, surveillance and awareness campaigns.

4: OPERATIONAL GUIDELINES

4.1: QUARANTINE & IMPORT CONTROL

The importation of livestock into the State of Sarawak is fully controlled by the Department of Veterinary Services Sarawak (DVS Sarawak) through the issuance of import permits. Sarawak only imports livestock such as cattle, goat and sheep from FMD-free countries according to WOAH Terrestrial Animal Health Code (Chapter 8.8.).

However, only fresh meat of water buffaloes is allowed to be imported from countries which are not free of FMD disease but must comply with Article 8.8.22. The import license contains conditions that must be fully complied with where failure to comply with any of the import conditions may cause the animal to be ordered to return to the country of origin or face legal action, Section (9), Veterinary Public Health Ordinance, 1999.

Veterinary Public Health Ordinance, 1999 also set some additional conditions for the import of domestic ruminants and pigs as follows:

Domestic Ruminants and Pigs

a) The animals must have visible identification for traceability.
b) The animals have been examined and found to be free from clinical signs of infectious and contagious diseases and fit to travel at the time of export and have a Veterinary Health Certificate from the Exporting Country.

The Department of Veterinary Services Sarawak, Director (State Veterinary Authority) reserves the right to amend the import conditions at any time when necessary. On arrival the animals shall proceed to undergo quarantine at the Bako Large Animal Quarantine Station or to an approved quarantine/farm facility for period of not more than ten (10) days and feeding of animals whilst in quarantine is to be borne by the owner of the animals.

4.2: ZONING

When FMD disease is detected through laboratory tests anywhere in the state of Sarawak, 3 new zones will be established to manage FMD disease, namely the Infected Zone, the Control Zone and the Free Zone.

The Infected Zone for FMD disease covers a distance of 1 kilometer radius around the Disease Index (DI). FMD vaccination in this area is mandatory and the movement of livestock out of this zone is prohibited. Monitoring will be intensified in these zones to determine the status of FMD disease infection and awareness campaigns will be enhanced as well.

In the Infected Zone, the Disease Index (DI) will be managed under a colour coded system to show the progress of the control activity, namely: Gray, Red, Yellow, Green and White. Please refer to Appendix 1 for details.

The Control Zone is a zone that is 2 - 10 km radius outside the Infected Zone. This zone is divided into two, namely Control Zone 1 and Control Zone 2. Control Zone 1 covers a 2-5 km radius where vaccination is still carried out in the zone. While Control Zone 2 covers a 5-10 km radius where surveillance and awareness campaigns are carried out intensively. The movement of livestock across the control zone is permitted with a special permit.

Apart from vaccination, animal quarantine activities, movement control, livestock slaughter control and disinfection are will be carried out. Awareness campaigns will be made strategically to stakeholders about the prevention, and control of FMD disease.

A Free Zone is a zone that is outside the boundaries of the Control Zone. It is an area where no cases of FMD have been reported where monitoring will be carried out as stipulated in the Annual National Surveillance Plan.

Changing the Control Zone into a Free Zone can be achieved through a screening test with negative results 2 times in a row within a 12-month interval. Livestock movement within the Free Zone is unrestricted. However, if it is to be taken to the Control Zone and the Infected Zone, a special permit must be obtained.

4.3: SURVEILLANCE

Surveillance is an important information-based activity involving the systematic collection, analysis and interpretation of large volumes of data originating from a variety of sources. The frequency of surveillance should be appropriate to the current disease situation. For FMD disease, surveillance will be carried out in two forms, namely active and clinical and carried out differently between zones. In Protected Zones and Free Zones, surveillance is determined and scheduled in the Annual National Surveillance Plan.

In clinical surveillance, monitoring will be carried out at the field level by observing clinical signs, mortality and reporting them. On FMD suspected premises samples should be taken and sent to the Sarawak Veterinary Diagnostic Laboratory (SVDL) for disease diagnosis purposes.

Surveillance in the Infected Zone and Control Zone will be carried out more intensively to detect and prevent the widespread spread of the disease. The objectives of surveillance in these zones are to:

- determine the extent of disease spread
- detect new outbreaks
- determine the current status of a zone

Surveillance in Infected Zone will be carried out on farm and livestock inspections by monitoring clinical symptoms. If necessary, samples are taken as monitoring support. The surveillance team that conducts monitoring and sampling should ensure that appropriate samples are taken. In order to avoid data dropout, detailed information should be collected by each division and submitted to the Epidemiology Unit to plan the action taken in the disease control area.

Surveillance in Control Zone involves monitoring at slaughterhouses, periodic serum sampling and investigating reported FMD cases. This surveillance method also will be used in areas outside the Control Zone to prove that the area is disease-free.

Sampling and surveillance during outbreaks need to be coordinated as best as possible to optimize existing resources, prioritizing reports of suspected cases in new areas. Strict decontamination procedures must be adhered to when entering and leaving the premises.

4.4: REPORTING

The speed of reporting for any incidents of infectious diseases is one of the determinants of the effectiveness of disease management and control. With reports, disease control actions such as mapping, and traceability can be done quickly to control infectious diseases from spreading. FMD is a reportable disease in Sarawak and the following actions should be carried out:

a) DVS officers must investigate reports of suspected FMD disease immediately and report to the Animal Health Division (AHD) within 24 hours.
b) If farmer or owner fails or does not report FMD incidents to the Department of Veterinary Services Sarawak (DVSS), legal action will be taken under Section 30, VPHO (1999).
c) If any Veterinarian fails to report FMD incidents to DVSS, legal action will be taken under Section 31(1) Animal Act 1953.

4.5: VACCINATION

Vaccination is one of the effective methods to increase livestock immunity against a disease. In FMD disease, the virus serotype needs to be identified first so that the correct and protective vaccine is used because the distinct serotypes are not cross protective. FMD vaccination is not allowed in Sarawak and Sabah because recognized as FMD-free Zone without vaccination. However, strategic vaccination will be considered in 2 situations, namely vaccination in the infected zone and the control zone. All livestock that have been vaccinated must have an identification mark for tracking purposes. All vaccinated animals should eventually be slaughtered as a condition to regain FMD disease-free status without vaccination.

Vaccination During an Epidemic (Vaccination Ring)

I. When there is an outbreak of FMD, the veterinary authority needs to plot the area of the village, district and division involved in the control program and identify the farmers and ruminant and pig population involved.

II. The range of the area involved in a ring vaccination is as shown in diagram 1 below:

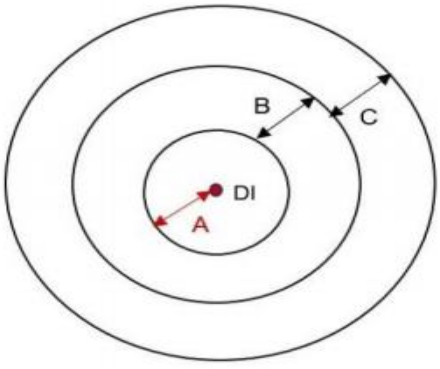


Diagram 1: Area from DI for vaccination action

	Disease Index (DI)	Infected Zone
A	1 km radius from DI	
B	2 – 5 km radius from DI	Control Zone
C	5 – 10 km radius from DI	

iii. Healthy livestock in the Disease Index Area and Area A and B (Control Zone 1) are required to be vaccinated against FMD.

iv. Livestock in area C (Control Zone 2) are subjected to clinical monitoring and active surveillance activities on suspected cases as well as an intensive awareness campaign.

v. Livestock that are infected in the disease index area are not given the vaccine and only receive supportive treatment as follows:

Treatment Guide

a) Isolate diseased livestock.
b) Clean the wound and wash it with a 7% iodine solution.
c) Spray woundsarex to prevent myiasis.
d) Cotton and gloves used during treatment must be collected and burned.

Vaccination Schedule

a) Records of vaccine use must be kept by the district/division that carries out the vaccination and to submit a copy to the Animal Health Division.
b) Vaccination must be done by the veterinary authority of the district/division involved.
c) Vaccination will be done on livestock aged 3 months and above as described below:
    - Primer 1 (P1) – first injection
    - Primer 2 (P2) – 4 to 5 weeks after the injection of primer 1
    - Repeat (Booster) – every 6 months

4.6: LIVESTOCK MOVEMENT CONTROL

The State of Sarawak will implement livestock movement control if there is a case suspected FMD under Section 33 and 35, VPHO (1999), if livestock is taken out of the premises, legal action can be taken against the owner. Any Livestock movement control will be announced by the Director of the Department of Veterinary Services Sarawak upon the advice of the Veterinary Health and Compliance Management Committee. The decision to cancel or extend movement control measures depends on the investigation findings and laboratory results.

When FMD disease is detected, all animals at infected premises will be quarantined. The ban on the movement of animals from the control zone to another zone will be lifted once the premises have been confirmed disease-free through monitoring. As for the infected zone, the ban on the movement of animals out of other zones will be withdrawn if the there are no clinical FMD cases detected 28 days after the last case was reported and vaccination coverage have reached 70% for all healthy animals in the Infected Zone and Control Zone 1.

The movement of animals and animal products in and out is prohibited during the surveillance and inspection period. Briefly, the movement of livestock when the zone is established is as follows:

		Destination		
Origin	ZONE	Infected Zone	Control Zone	Free Zone
	Infected Zone	Group 1	No Entry	No Entry
	Control Zone	Group 2	No Restriction	Group 3
	Free Zone	No Entry	No Entry	No Restriction

Group 1: Does not pass through other zones

Group 2: Not passing through the Free Zone (animals are vaccinated)

Group 3: Not passing through the Infected Zone

The movement of livestock across zones (except the Infected Zone) must meet the following conditions:

General Conditions

- Has been confirmed negative for FMD by the Sarawak Veterinary Diagnostic Laboratory (SVDL).
- Has been examined and certified healthy by a Veterinarian with a Veterinary Health Certificate.

Special Conditions

- Movement within the Infected Zone does not pass through other zones.
- Movement across Zones does not pass through the Infected Zone.
- Movement should be direct to the destination without transit.

4.7: SLAUGHTER HOUSE CONTROL

Livestock from Infected Zones can be slaughtered at council slaughterhouses or licensed slaughterhouses under the supervision of the divisional veterinary authority. All movement of livestock is only for slaughter and not allowed to be reared for breeding purposes nor transit to other places.

Livestock showing clinical signs of FMD at the slaughterhouse during antemortem examination should be isolated and treated until they are cured before slaughter.

The sale of slaughtered products is only allowed within the same zone. However, sales in other zones is allowed on the condition that the main bone and lymph nodes must be removed and left to mature at a temperature of 4°C for 48 - 72 hours (pH < 6). Waste from slaughter is disposed of in a suitable way either by burning or burial.

Slaughterhouse managers need to identify the original premises of the infected livestock and report the FMD incident to the nearest Divisional/District officer to conduct the disease investigation at the original premises of the infected livestock.

4.8: LIVESTOCK PRODUCTS CONTROL

Dairy Farm

I. Raw milk from FMD-infected farm cannot be sold unless it is sent to a factory to produce heat treated milk.
II. Milk from FMD-infected livestock must be treated by pasteurization or UHT methods before it can be sold.
III. Raw milk traceability must be done in dairy farms confirmed infected with FMD. If the raw milk has been sold and processed for human consumption, then surveillance should be carried out within a 1 km radius from the place where the milk is sold. Leftover raw milk is recommended to be treated by heating. On the other hand, if the raw milk is used on livestock, then the product must be treated before use.

4.9: DISINFECTION

Disinfection is done in an infected area to prevent the spread to a disease-free area. Disinfection should be done on equipment, vehicles and people because it can be spread through fomites. Some steps that can be taken to control FMD disease are as follows:

I. Farmers need to provide disinfection facilities at the farm entrance.
II. All vehicle tires entering and exiting the infected premises and premises within the 1 km radius from the infected premises must be sprayed with disinfectant or vehicle dip.

The use of appropriate disinfectant also plays an important role in carrying out this procedure. Examples of disinfectants that can be used are Lime powder, Virkon, Chlorine Powder or Lysol.

4.10: ANIMAL DISPOSAL PROTOCOL

Disposal is the activity of eliminating carcasses / animal carcasses / animal products / biological materials and infected materials individually or in large quantities that have been confirmed to be diseased or at risk with consideration of the appropriate method and suitable environment.

During a FMD epidemic, disposal will be carried out on dead livestock from the FMD virus. The recommended method of disposal in FMD disease control is by burial or burning. The disposal site must be identified in advance and with approval from the Natural Resources and Environmental Board (NREB) Sarawak and the Department of Irrigation and Drainage so as not to pollute the environment.

Disposal by burial can be done by loading all carcasses into a pit that has been dug, followed by covering the pit with soil and liming.

4.11: PUBLIC AWARENESS CAMPAIGN

Awareness campaign is an important element to create a society that is aware of their respective responsibilities irrespective of whether there is a disease outbreak or not, thus developing a rapid and stable information network. If there is a suspected case, the basic knowledge gained during the awareness campaign can lead to immediate reporting.

When an outbreak is detected, an effective awareness campaign can form a community that cares about the actions of the authorities and can provide appropriate cooperation to contain the disease from spreading to other areas.

Public awareness campaigns shall be conducted in community centres; at the workplace of the enforcement agency; public gathering places such as function sites, events; and through mass, electronic and social media.

The information presented should include general health aspects of FMD, factors that increase the risk of infection, introduction to the common and important clinical signs of FMD; method of reporting suspected cases as well as any related material.

Factors that cause disease such as the use of kitchen waste as livestock feed and movement control need to be emphasized. Explanation about the process of animal disposal during an outbreak needs to be emphasized to the public and media to avoid any issues related to the environment.

5: SUMMARY

In summary, this policy was developed to prevent, detect and eradicate FMD disease rapidly so that the impact on the economy is minimal, by using the following strategies:

a) Import animals from FMD disease-free countries or zones.
b) Import of animal products is based on risk analysis.
c) Quarantine requirements are imposed on imported and infected animals.
d) Three (3) zones are created in an FMD outbreak.
e) The implementation of active and clinical surveillance is different for each zone.
f) Prompt investigation and reporting of FMD infection cases.
g) Vaccination is only allowed in emergency situations.
h) Limited movement control may be imposed on suspected cases.
i) Slaughter is done under the supervision of the veterinary authority.
j) In the event of an outbreak, only processed and treated livestock products can be traded.
k) Disinfection is important to eradicate FMD disease.
l) Disposal of animals to destroy pathogenic agents with consideration of appropriate methods and suitable environment.
m) Conduct awareness campaign to inform the community in order to get their cooperation and contain the disease incidents quickly.

6: DISEASE DETECTION AND DIAGNOSTICS

Having skilled staff in detecting and diagnosing the disease is one of the rapid emergency response action required in eradicating FMD. FMD disease can be detected through clinical signs seen in livestock. FMD virus in livestock can be confirmed through the isolation and detection of the virus as well as serological tests from the laboratory.

6.1: CLINICAL SIGNS

The earliest signs in cattle are listlessness, lack of appetite and fever up to 40°C - 41°C. Vesicles, wounds, ulcers and sores on the mouth (tongue, gums, lips) and on the feet (interdigital spaces, coronet). Dairy cows also suffer from decreased milk production and sores on the teats. Excessive drooling and limping depending on the level of infection. Infected livestock will isolate themselves from the herd and may not be able to stand.

6.2: VIRUS DETECTION AND ISOLATION

FMD virus in livestock can be confirmed by isolation of the virus from the fluid in the vesicles and epithelial tissue of the lips, tongue and gums or detection by PCR method or FMDV Antigen ELISA test (Appendix 2 - Specimen Guide for FMD Virus Isolation, Serotyping, and Laboratory Tests).

7: ACTION PLAN IN FMD OUTBREAK

FMD outbreak needs to be dealt systematically to ensure the production of optimal output within the stipulated time. This section explains the activities to control the FMD outbreak; organisation chart of disease control activities; list of duties of members involved; function of the operation room as well as the necessary facilities and tools.

Briefly, a cycle of disease control activities begins with the investigation of suspected cases and ends with the closure of control activities when the Green Disease Index is reached. Here are the processes involved in a chronological order:

I. Suspected Case
II. Further investigation / Sampling
III. Laboratory Results
    - Negative – End
    - Positive – Follow the next step
IV. Declaration of outbreak
    - Minister of Food Industry, Commodity & Regional for declaration of disease outbreak
    - Gazette the Declaration Order through State Attorney General
V. Field Activities (Simultaneous)
    - Operation centre is activated
    - Ring vaccination in Infected Zone and Control Zone 1.
    - Enhance surveillance and awareness campaign in Control Zone
    - Enforcement of inter-zonal movement regulations
    - Disposal of dead animals due to FMD infection
    - Disinfection (premises, vehicles and equipment)
VI. Closure of Operation Room
    - No new FMD clinical cases detected through surveillance in the infected zone and the control zone for the past 28 days.
    - Vaccination coverage in the Infected Zone and Control Zone 1 have reached 70% of the total ruminant and pig population.

7.1: ORGANISATION CHART FOR FMD OUTBREAK CONTROL

The Organisation chart for FMD disease control and eradication operations depends on the location and locality where the outbreak is detected. If the outbreak only involves one district within the division, a Simple Outbreak Organisation Chart will be used. Meanwhile, a Multiple Outbreak Organisation Chart is suggested, should the disease outbreak occur in more than one district within a division. However, if outbreaks are detected in several divisions, each division in Sarawak will have its own organisation chart.

7.2: OPERATION CENTRE/ROOM

The Operations Centre plays an important role to connect the outbreak area with the management team. The function of the Operation Centre include:

I. Collecting daily operation information from the outbreak area
II. Verifying daily information submitted from the epidemic area
III. Reviewing and analyzing daily information
IV. Preparing daily reports to be distributed to relevant authorities
V. Preparing reports for mass media
VI. Receiving reports from the public
VII. Ensuring reports from the public are followed through

7.3: OPERATION STAFF

Operation Centre Officers include:

I. Head of Operation Centre:
    - District Officer (Single Outbreak)
    - Divisional Officer (Multiple Outbreak)

II. The members consist of personnel from the district where the operation room is activated. The officers on duty must always be in the Operation Room throughout the period the epidemic declaration is in force.

7.4: STAFF COMPETENCY

Each member working in the Operation Room must have the following competencies:

I. Use of ICT (Computer/fax/email)
II. Use of office equipment
III. Recognizing clinical signs of FMD disease

7.5: OPERATION ROOM FACILITIES

The FMD infection control operation centre needs to be equipped with the following equipment and facilities:

I. Telephone line - hotline, SMS link
II. Map of state/division/district
III. Access to computers with internet connection- email, websites
IV. Posters, brochures, leaflets
V. Common office equipment
VI. Field technical equipment - please refer to the staff equipment attachment
VII. Access to refrigerators and vaccines
VIII. Database – cabinet files and files
IX. Technical disease information (Manual / disease control protocol)
X. List of operation members.
    - Name, address, mobile phone number including drivers with their respective office vehicle license plate number and vehicle condition
XI. List of Private Veterinarians

7.6: DATA MANAGEMENT

The Operation Room is a component of the operation centre playing an important role in receiving data from various sources. The data will be analyzed and compiled into information. The information in the form of reports will be released from time to time according to the needs and instructions from the management. The sources of information normally received by the operating room come from:

I. Control Steering Committee
II. AMT – Alert Management Team
III. Field Officer
IV. Diagnostics (e.g.: laboratory)
V. Public / Farmers

The information obtained must be recorded in the relevant form and appropriate action must be taken. Forms that are common and must be present in the operation centre include: Complaint Form, Attendance Form, Vaccination Form, Surveillance Form, Disposal Form, Laboratory Test Form, Disinfection Form and Movement Form.

Every report prepared and issued from the Operation Room must first be reviewed and approved by the Head of the Operation Room. Information released from the Operating Room include:

I. Daily Report (Infection/vaccination/disposal/disinfection)
II. Final Report
III. Instructions from time to time to all teams
IV. Financial report of the disease control operations centre

7.7: TASK LISTS AND CHAIN OF COMMAND

Operation Director (OD): Deputy Director of Veterinary Health and Compliance

I. Deliver and implement top management directives.
II. Plan, conduct, supervise, monitor and evaluate strategies and disease control together with committee members.
III. Present operation report to the Director of DVS Sarawak.
IV. Prepare reports to mass media and other government agencies after getting approval from the Director.
V. Give instructions to committee members.
VI. Budget financial requirements and obtain funding from Management.
VII. Chair Divisional Disease Control Operation Centre Committee Meeting.

Deputy Operation Director (DOD): Head of Animal Health Division (HAHD)/Regulatory Division(HRD)

I. Implement all disease control activities in the division.
II. Regulate movement, surveillance activities and disease investigation information.
III. Head of the operation room in a "multiple outbreak" situation.
IV. Take over Chairman's duties when required.

Rapid Action Team (RAT)

I. Receive instructions from the DOD or operation room to investigate FMD suspected disease reports.
II. Carry out field investigations and obtain information on the disease incident (Animal, Place and Time).
III. Sample animals showing clinical symptoms of FMD disease and carry out the initial treatment for animals with clinical symptoms.
IV. Provide advisory services and awareness to farmers during investigations.
V. Report the results of the investigation to the operation room.

Head of Operation Room (Divisional Office Head)

I. Supervise all activities in the operation room.
II. Coordinate communication with the OD and other agencies.
III. Prepare and organize information and daily operation schedules for the action of committee members .
IV. Provide operation room facilities - maps, pictures, census, etc.
V. Distribute information to the management and field staff.
VI. Prepare reports (Daily/Final) for the management.

(Role to be taken over by HAHD or HRD in multiple outbreaks)

Chief Enforcement Officer

I. Plan and coordinate all enforcement activities throughout the state including "checkpoints" and patrolling border / high risk areas.
II. Maintain quarantine on infected premises.
III. Investigate cases that violate enforcement laws.
IV. Manage the disposal of confiscated items according to procedure.
V. Carry out patrols and roadblocks to curb the movement of animal within the state.

Head of Disposal

I. Plan and coordinate disposal activities on materials that can spread FMD disease and dead livestock in infected areas.
II. Liaise with agencies that have assets which can be used for disposal activities.
III. Get advice from the Natural Resources and Environment Board (NREB) Sarawak and the Department of Irrigation and Drainage (DID) before carrying out any large-scale disposal.
IV. Disposal methods include burial or burning which must comply with existing regulations.
V. Prepare disposal data/report.

Head of Surveillance

I. Plan active and clinical surveillance activities in infected zones and control zones.
II. Ensure that each group performs their tasks in the assigned zone to prevent the spread of disease.
III. Conduct livestock census in Infected Zone and Control Zone.
IV. Obtain demographic and socioeconomic data of the population in the Infected Zone & Control Zone.
V. Conduct active and clinical surveillance for FMD disease in the Control Zone.
VI. Establish good relations with local community leaders.
VII. Conduct awareness campaigns in infected and control zones before carrying out disposal and vaccination activities.

Head of Vaccination

I. Receive instructions from the operation room to vaccinate livestock.
II. Plan vaccination in Infected Zone and Control Zone.
III. Ensure that the number of vaccine brought is enough from the livestock census data.
IV. Ensure that the equipment (PPE) and tools used for livestock vaccination are sufficient.
V. Prepare livestock vaccination reports and submit to the operation room.

Head of Logistics

I. Coordinate epidemic logistics needs such as safety clothing, equipment for disinfection, sampling equipment and FMD vaccine for each task force.
II. Ensure the provision of equipment and essential items for "field operation" is sufficient.
III. Manage the requirement of vehicles, equipment and others.

8: CONCLUSION

Strategies and plan of actions to control and eradicate FMD disease is dynamic and needs to be improved in accordance with the development of risk factors and diagnostic technology knowledge. Until there is any significant development on the above matter, this policy is applicable throughout the State of Sarawak for the purpose of preventing the entry of FMD disease, controlling and eradicating the FMD epidemic if it succeeds in penetrating the state borders.

9: REFERENCES

AUSVETPLAN. (2014). Disease Strategy Foot and Mouth Disease. 3rd Edition. Australian Veterinary Emergency Plan, Version 3.4. Agriculture Ministers' Forum. Australia.

JPV, Malaysia. (2010). Kempen Kesedaran Awam. Kementerian Pertanian Dan Industri Asas Tani, Malaysia. *Arahan Prosedur Tetap Veterinar Malaysia, (APTVM)*, 21(a):1/2010.

JPV, Malaysia. (2010). Penghapusan. Kementerian Pertanian Dan Industri Asas Tani, Malaysia. *Arahan Prosedur Tetap Veterinar Malaysia, (APTVM),* 21(e):1/2010.

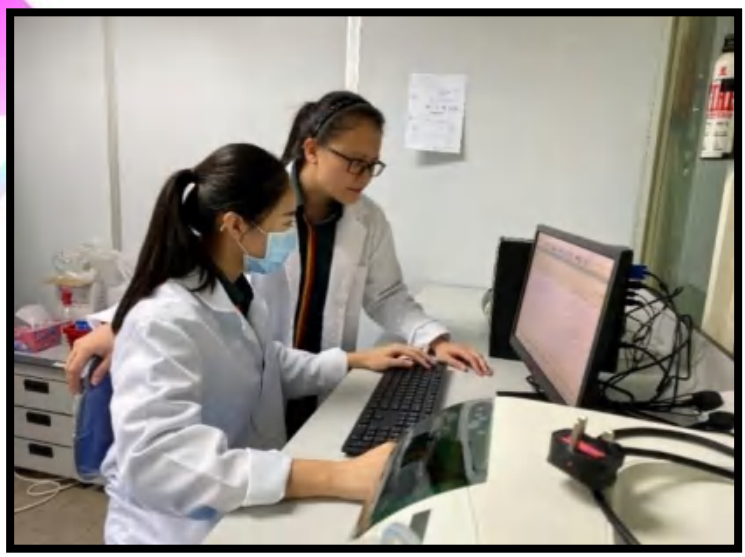
JPV, Malaysia. (2011). Penyakit Kuku dan Mulut - Foot and Mouth Disease (FMD). Kementerian Pertanian Dan Industri Asas Tani, Malaysia. *Protokol Veterinar Malaysia (PVM)*, 1(9):1/2011.

JPV, Malaysia. (2020). Penyakit Kuku dan Mulut - Foot and Mouth Disease (FMD). Kementerian Pertanian Dan Industri Makanan, Malaysia. *Protokol Veterinar Malaysia (PVM)*, 1(9):2/2020.

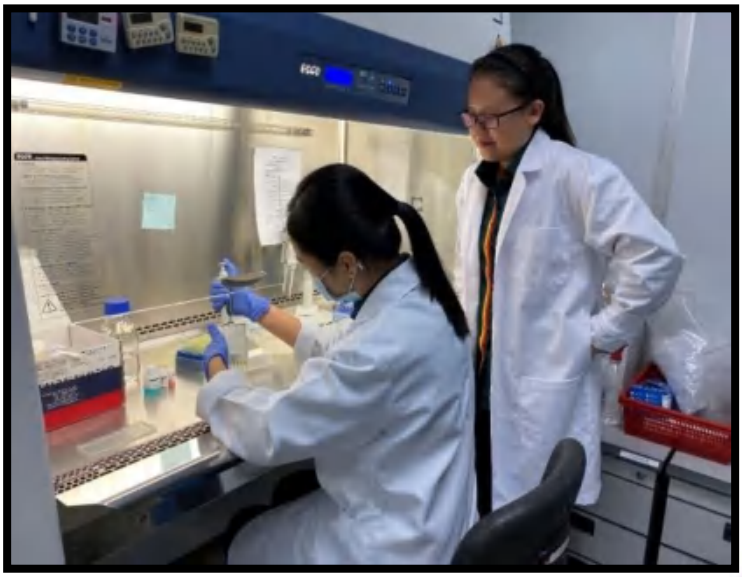
JPV, Malaysia. (2021). Disinfeksi. Kementerian Pertanian Dan Industri Makanan, Malaysia. *Arahan Prosedur Tetap Veterinar Malaysia*, *(APTVM)* 22(d):1/2021.

JPV, Sabah. (2022). Polisi Pengurusan Penyakit Kuku dan Mulut (FMD). Jabatan Perkhidmatan Veterinar Sabah.

WOAH. (2023). Founded as OIE. Codes and Manuals. Terrestrial Code Online Access. Animal Diseases. Foot and mouth disease. From https://www.woah.org/en/disease/foot-and-mouth-disease/ Retrieved on May 17th, 2023.



10: APPENDICES



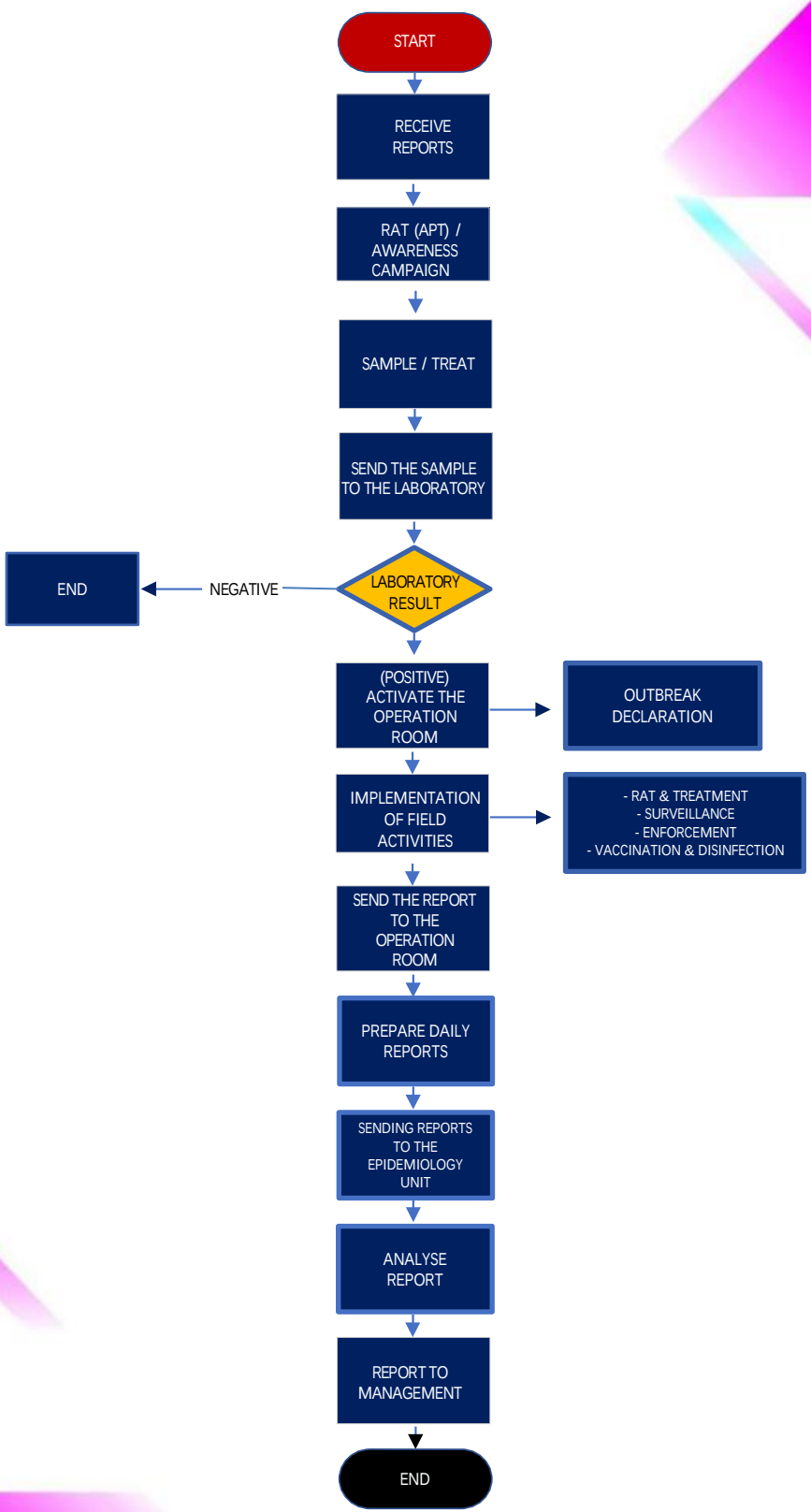
APPENDIX 1 - DISEASE INDEX MANAGEMENT

DISEASE INDEX	COLOR	NOTE
Suspected Index	Grey	• Clinical case detected in livestock through clinical symptoms of FMD • Send Epis 01 (Suspected) report to Epidemiology Unit
Active Index	Red	• Disease incidence case is confirmed based on laboratory diagnosis. • Set a 1 km radius from the infected premises as an infected zone and a 2-10 km radius as a control zone. • Send Epis 01 (Active) report to the Epidemiology Unit
Controlled Index	Yellow	• Measures to control and curb the spread of disease according to policy. 1) Quarantine infected animals 2) Emergency vaccination *'ring vaccination'* 3) Movement control 4) Disinfection (premises, vehicles, and equipment) • Send the Epid 06 report (Control) to the Epidemiology Unit
Recovery Index	Green	• The control measures above (yellow) are satisfactory • No clinical signs 28 days from the date of the last case in the same district. • Send the Epis 06 report (Recovery) to the Epidemiology Unit
Free Index	White	• No new cases detected through screening tests in the herd after 2 times of surveillance within 2 years (12 months apart) from the date of the last infected case detected.

APPENDIX 2 - SPECIMEN TYPE GUIDE FOR FMD VIRUS ISOLATION, SEROTYPE, AND LABORATORY TESTS

SPECIMENS	TIME	TEST	PURPOSE
Epithelium Tissue	During clinical and before lesions heal	i) ELISA Antigen Detection ii) PCR	Confirmation of disease and serotype
		Isolation of Viruses	- Virus subtyping - Comparison with vaccine virus strains
Serum	After 30 - 60 days the vaccine is injected	ELISA LPBE	To determine the level of vaccination immunity
Serum	When needed	ELISA FMDV NSP	- To determine the status of FMD infection - DIVA test to detect antibodies from field infection among the vaccinated livestock

APPENDIX 3 - FMD CONTROL ACTIVITY CHART



JABATAN PERKHIDMATAN VETERINAR SARAWAK
(*Department of Veterinary Services Sarawak*)
IBU PEJABAT PERKHIDMATAN VETERINAR,
LOT 877, JALAN SEMENGGOK, OFF BATU 12 JALAN
KUCHING–SERIAN,93250 KUCHING, SARAWAK

Tel: 082-628248 | Faks: 082-628227 | Email: dvs@sarawak.gov.my
Website: dvs.sarawak.gov.my | FB: www.facebook.com/DVSSarawak