FEDERATIVE REPUBLIC OF BRAZIL
Ministry of Agriculture, Livestock and Food Supply
Secretariat for Agricultural Defense
Animal Health Department

BRAZILIAN SURVEILLANCE AND VETERINARY EMERGENCIES SYSTEM
SISBRAVET

CONTINGENCY PLAN FOR FMD

- TACTICAL AND OPERATION LEVELS -

ANIMAL HEALTH EMERGENCY DECLARATION AND MANAGEMENT

EDITION JULY/2020

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Initial considerations

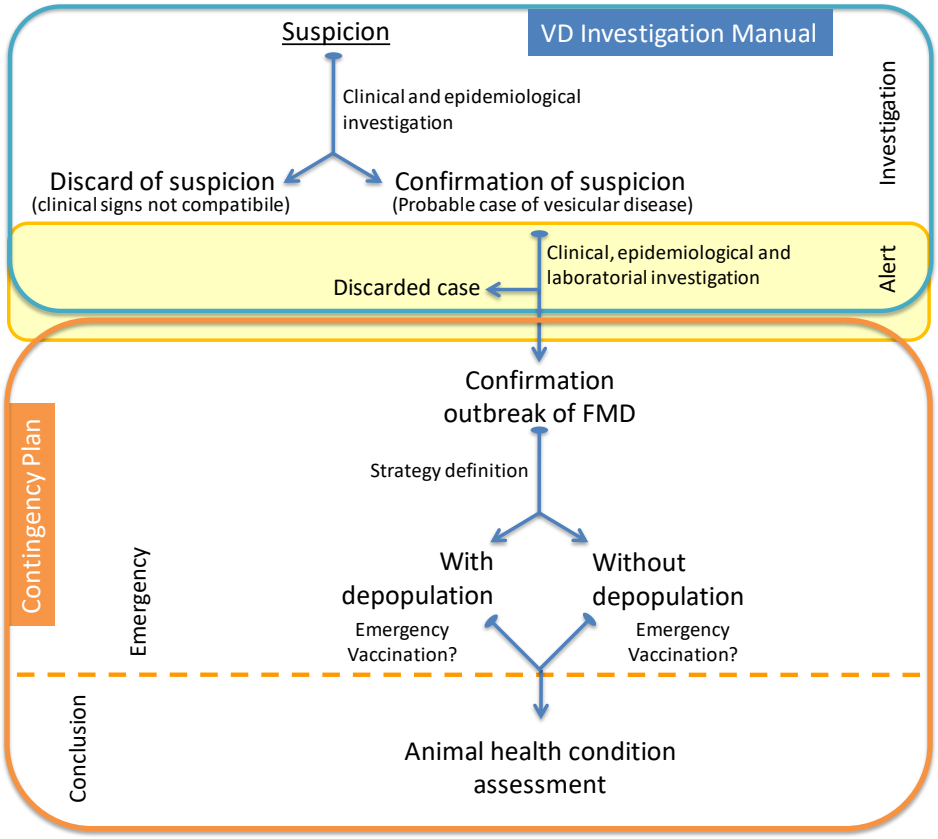
The occurrences of Foot-and-mouth disease (FMD) recorded in Brazil, at the end of 2005, in the free zone with vaccination, as well as the experiences obtained in the prevention and preparation for action in cases of avian influenza, in face of the pandemic recorded in 2009, reinforced the need for a review in the procedures for operating in animal health emergencies, which represent a complex set of activities distributed in an intricate network of technical, political, economic and social aspects. Thus, this action presupposes planning and definitions related to all aspects involved, constituting a control and management system, such as the "National System for Agricultural Emergencies" (SINEAGRO), instituted by Normative Instruction No. 15, of March 9, 2018. This System, within the scope of the Ministry of Agriculture, Livestock and Supply (MAPA), is organized into four levels of coordination with different attributions and responsibilities in order to allow an adequate institutional organization: **Level 1**, political-administrative, under the direct responsibility of the Minister, with legal acts and institutional guidelines as the main regulations and organization documents; **Level 2**, strategic, represented by the Secretariat of Agricultural Defense (SDA), referring to the decision making aimed at the implementation, maintenance, and evaluation of the entire system, with emphasis on the elaboration and updating of the National Contingency Plan for Agricultural Emergencies (PNCEA); **Level 3**, tactical, under the responsibility of the Departments of Animal Health (DSA) and Plant Health (DSV), including technical guidelines for carrying on\agricultural emergency actions, according to the type of harm or incident; and Level 4, operational, represented by provisional structures created specifically to respond to agricultural emergencies. For levels 3 and 4, there is the standing out effective participation of the State Agencies for Agricultural Defense.

In the area of animal health, the "National Animal Health Information System" (SIZ) and the "Brazilian Veterinary Surveillance and Emergency System" (SISBRAVET) are constituted, both under the coordination of the Animal Health Department (DSA / SDA / MAPA). These systems encompass the flow of information and the technical guidelines for surveillance of animal diseases in all phases of action (prevention, detection, and containment), having as reference the list of diseases subject to the application of animal health protection measures, described in the Normative Instruction No. 50, of September 24, 2013.

In the specific case of FMD, the general guidelines for action are defined by Normative Instruction No. 48, of July 13, 2020, which defines the bases for the National FMD Surveillance Program (PNEFA). Among the technical documents to support action in the face of suspected vesicular disease, with emphasis to the publication in 2009 of the "Plan of Action for FMD - volume 1", updated in 2020 and renamed the Vesicular Disease Investigation Manual, dedicated to the investigation and alert phases, having been made available to all veterinarians of the official service, in printed and electronic format, and used as a reference document for the training conducted within the Federation units. As of 2010, there were meetings and studies started in order to prepare this document, with specific instructions to be adopted in the face of the confirmation of the occurrence of the disease. Therefore, it refers to the emergency and completion phases, requiring specific training of professionals who must remain in constant preparedness to act in animal health emergencies. Its elaboration involved intense review activities and several technical meetings, a simulated field study in 2019, and this document represents the result of this work, after contribution and validation by the Veterinary Services in the Federation units.

The organization of these documents considers the different phases of action in the FMD surveillance system, as summarized in the diagram below. However, It must be clear that the proposed schematic division cannot reduce the importance of the close dependence and connection between the existing phases, that is: the EMERGENCY phase, in fact, begins during the ALERT phase, which, in turn, instead, depends on the quality of the work carried out during the INVESTIGATION phase and, finally, the COMPLETION phase of the animal health emergency activities will directly depend on the quality and effectiveness of the operations developed in the previous phases.

Phases of the FMD surveillance system



In addition, there was also the preparation of this document, the review and update of the “Action Plan for FMD - volume 1. An important adjustment was made regarding the denomination of the documents, with an option to change the name of volume 1 to “Vesicular diseases (VD) investigation Manual" and this hereby document for "Contingency plan for FMD - Tactical and operational levels", in order to adjust to the terminology used in different countries and, thus, improve international dialogue, as well as highlight the levels of coordination of SINEAGRO, including the expression “tactical and operational levels”.

As of 2018, with the entire national territory free of FMD recognized by the World Organisation for Animal Health (OIE), a new stage in the country begins, aimed at the progressive implementation of free zones without vaccination, as proposed in the Strategic Plan - 2017 - 2026. According to the aforementioned Plan, “The expectation is to promote significant changes in the way the Program operates, which will stop using systematic vaccination and will increasingly reinforce the [surveillance] mechanisms, aiming at expanding the capacity for early detection and quick response to possible occurrences of FMD ”. To this end, among the strategic guidelines provided for, there are the adequacy and strengthening of the surveillance system, which should have enough capacity to face the challenges of the new animal health condition, strengthening the actions of early detection and quick response to emergencies. This document seeks to contribute, specifically, to the preparation for responses on the occurrence of FMD.

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FIGURES

ATTACHMENTS

Acronyms used

COEZOO	Animal Health Emergency Operations Center
DSA	Department of Animal Health
FORM-COM	Investigation form, complementary
FN-SUASA	National Force of the Unified System of Attention to Agricultural Health
FORM-IN	Investigation Form, initial
GTA	Animal Traffic Guide
MAPA	Ministry of Agriculture, Livestock and Supply
OIE	World Organisation for Animal Health
Panaftosa	Pan American FMD Center
PGA	Agricultural Management Platform
PNCEA	National Contingency Plan for Agricultural Emergencies
PNE	Non-structural proteins
PNEFA	National Surveillance Program for FMD
SCI	Incident Command System
SDA	Secretariat of Agricultural Defense
SFA	Federal Superintendence of Agriculture, Livestock and Supply
SINEAGRO	National Agricultural Emergency System
SINPDEC	National System of Protection and Civil Defense
SISBRAFITO	Brazilian System of Surveillance and Phytosanitary Emergencies
SISBRAVET	Brazilian Veterinary Surveillance and Emergency System
SIZ	National Animal Health Information System
SVS	State Veterinary Service
SVO	Official Veterinary Service (federal and state)
EU	European Union
UF	Federation Unit

INTRODUCTION

Foot-and-mouth disease (FMD) is a worldwide disease with high morbidity in non-immunized herds. Its occurrence in Brazil is classified as an emergency, in view of the Animal Health condition of the Country and the serious socioeconomic consequences that arise from it. Operations during Animal Health emergencies involve complex measures and require adequate field operational structure. The occurrences of the disease in the country, like those recorded in Mato Grosso do Sul and Paraná, in 2005 and 2006, and in Rio Grande do Sul, in 2000 and 2001, as well as the experiences obtained in the prevention and preparation for action in cases of avian influenza, demonstrate the impossibility of Animal Health emergency actions to be limited to the structures of the Brazilian Veterinary Service: Ministry of Agriculture, Livestock and Supply (MAPA), and State Veterinary Services (SVS). There is a clear need to count on the support of other government structures, both in the federal sphere, as well as on state and municipal agencies, with emphasis on the Ministries of Defense, National Integration and Justice.

In order to improve the necessary institutional interrelationships, especially with the National System of Protection and Civil Defense (SINPDEC), the National System of Agricultural Emergencies (SINEAGRO), [1] and its subsystems in the animal (SISBRAVET - Brazilian System of Surveillance and Veterinary Emergencies) and plant (SISBRAFITO - Brazilian Surveillance and Phytosanitary Emergencies) areas, considering the definition of DISASTER as "the result of adverse events, natural or man-made, on a vulnerable ecosystem, causing human, material and environmental damage, and resulting economic and social damage", [2] Animal Health emergencies, such as the occurrence of FMD, are classified within the parameters adopted by SINPDEC, as a state of emergency or state of public calamity. [3] This understanding allows triggering the entire government system that aims, among other objectives, to prevent or minimize damage, to help affected populations, to rehabilitate and recover areas deteriorated by disasters. All procedures related to the declaration of the state of public calamity, as well as the organization and insertion of the animal health defense system in SINPDEC, should be established and described in the National Contingency Plan for Agricultural Emergencies (PNCEA), to be prepared by MAPA, and, therefore, are not part of this document. The plan, of a strategic nature, shall specify the administrative authorities that must intervene and their respective powers and responsibilities, as well as the channels and procedures for exchanging information between all those involved.

The **contingency plan for FMD - tactical and operational levels** aims to describe the specific operations involved in the containment and elimination of outbreaks of FMD, and to present the structure and field organization necessary for the execution of these operations, as well as to create conditions for evaluation of animal health condition during the completion phase. However, due to the geographical, livestock and

[1] MAPA Normative Instruction No. 15 of March 9, 2018

Article[2] of Decree No. 7,257 of August 4, 2010, which regulates Law No. 12,608 of April 10, 2012, establishing the National Policy for Civil Protection and Defense - PNPDEC; and provides for the National System of Protection and Civil Defense - SINPDEC and the National Council for Civil Protection and Defense - CONPDEC

[3] Definitions according to Decree No. 7,257/2010:
. Emergency situation: an abnormal situation caused by disasters, causing damage and damage that implies the partial impairment of the response capacity of the public power of the affected member.
. State of public calamity: an abnormal situation caused by disasters, causing damage and damage that implies the substantial impairment of the response capacity of the public power of the affected member.

socioeconomic diversity of the country, contingency plans cannot be expected to fully meet all demands during an emergency action. These Plans are tools that help to reveal the objectives and guide procedures in Animal Health emergency situations. Due to the diversities found in the field, there will always be a need for adaptations. For this reason, those professionals in charge of managing emergency operations in the field must have operational autonomy and the technical knowledge necessary for decision- making.

This document was prepared based on the same references and experiences described for the **Vesicular Disease Investigation** Manual. Its publication was also preceded by technical discussions, with the participation of different sectors of MAPA and SVS, with addition of the experiences accumulated during the simulated exercises of emergence in FMD conducted in Mato Grosso, in 2009, and Paraná, in 2019, with technical support from the Pan American Center for FMD (PANAFTOSA).

The items that make up this document are grouped into two parts. **The first** consists of the items related to definitions, knowledge and procedures that precede the field implementation of Animal Health emergency activities and deal with the following subjects:

- Item 1 → points to consider for defining the initial strategy in the emergence of FMD.
- Item 2 → immediate procedures after confirmation of FMD outbreak, with emphasis on the flow of communication of Animal Health occurrence.
- Item 3 → legal basis related to emergence in FMD.

Given that the above issues involve legal rules, as well as international rules or agreements, there is a need for constant updating.

The second part deals with the specific objective of this document: implementation and management of activities, and field procedures for the containment and eradication of outbreaks of FMD.

Due to the complexity of the subject and considering the particularities and details of the different activities involved in an Animal Health emergency, the preparation for action in the eradication of outbreaks of FMD should not be limited to this document. In addition to the complete mastery of the **Vesicular Disease Investigation Manual,** complementary readings are strongly recommended, especially:

- Health Code for Terrestrial Animals, World Organiszation for Animal Health (OIE), with emphasis on the following chapters (http://www.oie.int/es/normas-internacionales/codigo-terrestre/acceso-en-linea/):
  - Chapter 4.4: Zoning and compartmentalization
  - Chapter 4.13: Disposal of dead animals
  - Chapter 4.14: General recommendations on disinfection and disinfection
  - Chapter 4.18: Vaccination
  - Chapter 7.5: Slaughter of animals
  - Chapter 7.6: Killing of animals for disease control purposes
  - Chapter 8.8: Infection with foot and mouth disease virus
- Guide to the attention of outbreaks and situations of health emergencies of FMD, published by the United Nations Food and Agriculture Organization (FAO), 2013, (http://www.fao.org/3/a-i3168s.pdf)
- Manual procedures for attention to FMD occurrences and other vesicular diseases, PANAFTOSA (http://www.agricultura.gov.br/arq_editor/file/procedimentos_panaftosa.pdf)

PART 1

Definition of strategies and declaration of Animal Health status of emergency

1. Points to consider for defining the initial strategy in the emergency for FMD

Interventions in animal health emergencies, such as FMD, involve an essentially geographical operational approach, including economic and social interrelationships between the different actors participating in agro-industrial systems or agroproductive chains. The initial objectives, regardless of the specific strategies to be adopted, aim to know the dimension of the problem, seeking its containment to the smallest possible territorial space, with consequent reduction of economic and social impacts. To this end, the following procedures should be adopted immediately, which will be further detailed in the second part of this document:

a) identification and intervention in the outbreaks, aiming, among other activities, to contain and eliminate sources of infection and to gather information to support the identification of the origin of the viral agent;

b) analysis of animal movement and epidemiological investigation with inspection in rural properties, especially those with epidemiological link (e.g., ingress/egress of animals or geographical proximity). The identification of the probable origin of the viral agent should be identified, and the existence of secondary outbreaks should be evaluated, as well as assessment of the extent and contiguity of the affected areas;

c) delimitation of initial geographical space for interdiction and intervention, with a prohibition of movement of animals and risk products; and

d) organization and mobilization of the technical and structural apparatus to be used in the management of activities of containment and elimination of the Animal Health occurrence.

The above procedures are important both for the initial containment of the disease and to support decision-making about the specific strategies to be used, and may include one or more of the following activities: stamping-out policy, quarantine, movement control, screening, zoning, emergency vaccination, and biosafety measures. These activities are the three fundamental principles for the control of transmissible diseases (FAO, 2011): [4] reduction/restriction of the production of the disease agent; reduction of the contact rate in the population; and reduction in the number of susceptible animals.

It is important to highlight that prior knowledge of existing livestock production systems, including the flows and relationships between the different actors involved (value analysis of production chains), associated with the assessment of the risks of diseases occurring and disseminating among the different elements that make up these production systems (risk-based analysis), this is, as recommended by FAO (2011)[4], an indispensable measure for adequate efficiency and definition of surveillance actions, regardless of the phase involved: prevention, detection or containment. **In summary, the performance in Animal Health emergencies requires preparation, especially at local and state level, including up-to-date knowledge about the systems and processes of livestock production and marketing, with identification of the main flows and existing links.** This knowledge is important for defining Animal Health measures of greater efficiency and lower economic and social impact, with the participation of the main actors involved.

[4] FAO. 2011. *A value chain approach to animal diseases risk management – Technical foundations and practical framework for field application.* Animal Production and Health Guidelines. N° 4. Rome (http://www.fao.org/docrep/014/i2198e/i2198e00.htm)

The preliminary delimitation of the emergency area should involve a wider area that guarantees a high probability of including all cases, until better knowledge about the extent and intensity of the problem and more specific information is obtained. This initial delimitation should be carried out immediately, under the responsibility of MAPA and with the knowledge and participation of the SVS involved. In the occurrences of FMD recorded in Brazil, the initial criterion of interdiction has been adopted, the total area of the municipalities affected by a radius of 25 km measured from the index outbreak, associated with the [5] evaluation of issues such as: existence of geographical barriers; road network; capacity for rapid implementation and pre-existence of control points; predominant livestock production system and initial evaluation of the region's vulnerabilities and about the economic and social interrelationship with other locations in the country. This is a practical approach to initial decision-making, but it does not apply to all situations and regions in the meantime. It is important to reinforce that the initial interdiction area should be feasible, that is, allow adequate and proven separation and control, by the Official Veterinary Service (SVO), in relation to the rest of the country. In addition, it should be clear that the radius of 25 km represents only an imaginary line, not being recommended as a limit of interdiction, as well as for the implementation of checkpoints.

The definitions of the other strategies and measures to be adopted should be shared between MAPA and SVS, considering, in addition to the points mentioned, the Animal Health condition of the affected region; the operational capacity of the SVO and the economic viability of the procedures envisaged.

Next, three themes are directly involved with the definition of strategies to be adopted in the Animal Health emergency and which should be of broad domain by the professionals involved in the decision-making processes: deadlines for the restitution of the international animal health condition; use of emergency vaccination; and implementation of a containment zone or infected zone and its protection zone. Among other topics that should be considered in the definition of intervention strategies are the issues related to the indemnification of animal owners and their availability of compensation funds, which will be addressed in the second part of this document.

[5] The establishment of rays around outbreaks of communicable diseases, such as foot-and-mouth disease, has been part of the OIE's recommendations since the first version of the Terrestrial Code, from 1968, until its 10th edition, of 2001, which contemplated the following definition of infected zone: "*clearly delimited territory within a country where one of the diseases registered in the Code has been diagnosed and whose extent must be defined and established by the veterinary authority, considering the environment, the different ecological and geographical factors, all epidemiological factors and the livestock farming system. Said territory should extend in a radius of at least 10 km around the foci of diseases in regions of intensive breeding, and at least 50 km in the regions of extensive* breeding".

Specifically, the 25 km radius has been adopted in Brazil since the 1980s, during FMD control activities, as a result of trade agreements with the European Union. At that time, in the areas enabled by the aforementioned economic block, the beef exported could only be obtained from animals located in properties without record of FMD for more than 60 days and in whose radius of 25 km the disease had not been recorded in the 30 days prior to export. Its establishment is based on the characteristics of disease dispersion and animal movement. It was efficient at the time of disease control, being maintained as an initial parameter to support the definition of the initial areas of interdiction during the activities of containment and eradication of outbreak of FMD.

1.1. Deadlines for restitution of international animal health condition

In the specific case of occurrences in a country or area free of FMD recognized by the OIE, international rules for the restoration of the animal health condition should be assessed. These rules are agreed by OIE member countries and published in the Terrestrial Animal Health Code (Terrestrial Code). This Code undergoes annual updates and its 2019 edition brings, in its Article 8.8.7, the following options for deadlines for the restitution of the Animal Health condition for FMD (free translation from the Spanish version – highlights and emphasis on our):

1. *For recovery of the condition of a country or zone free of FMD **without** vaccination:*
   a) ***three months** after the disposal of the last killed animal, when using* the stamping-out policy*, without emergency vaccination, and carrying out surveillance in accordance with Articles 8.8.40 to 8.8.42; or*
   b) ***three months** after the elimination of the last killed* animal *or the slaughter* of *all vaccinated animals (of the two, the most recent), when using* stamping-out policy *and emergency vaccination, and surveillance is carried out in accordance with Articles 8.8.40 to 8.8.42;*
      - ***six months** after the elimination of the last killed* animal or the last *vaccination (of the two, the most recent), when* the stamping-out policy *and emergency vaccination* are used without *the slaughter* of *all vaccinated animals and surveillance is carried out in accordance with Articles 8.8.40 to 8.8.42. However, this requires serological study to detect antibodies against non-structural proteins (PNE) of FMD virus to demonstrate that there is no* evidence of *infection* in the rest of *the vaccinated population.*

      ➔ ***If the above periods*** are not used for stamping-out policy***, the above periods do not apply, referring to Article 8.8.2 (12 months after the last case and without vaccination).***

      *When a case of FMD is recorded in a disease-free country or zone **without vaccination,** where stamping-out policy* and a continued *vaccination policy* have *been adopted, the following waiting period is required for restitution of the condition of a country or free zone* with *vaccination: **six months** after the elimination of the last killed animal, evidence provided that surveillance is being applied in accordance with Articles 8.8.40 to 8.8.42, and that serological study for the detection of antibodies against PNE of FMD virus demonstrates that there is no evidence of viral transmission.*
      ...

      ➔ ***If the above periods*** are not used for stamping-out policy***, the above periods do not apply, referring to Article 8.8.3 (24 months after the last case).***

2. *For recovery of the condition of a country or zone free of FMD **with** vaccination:*
   - ***six months** after disposal of* the last *killed animal, when* using *stamping-out policy and* emergency *vaccination, and surveillance is carried out in accordance with Articles 8.8.40 to 8.8.42, whenever and when the results of serological surveillance for the detection of antibodies against PNE of FMD virus show no* evidence of *viral transmission; or*
   - ***twelve months** after detection of the last case, when* stamping-out policy is not *used, but emergency vaccination, and surveillance is carried out in accordance with Articles 8.8.40 to 8.8.42, whenever and when the results of serological surveillance for the detection of antibodies against PNE of FMD virus show no* evidence of viral *transmission.*

   ➔ ***If emergency vaccination*** is not ***used, the above waiting periods will not apply, referring to Article 8.8.3 (24 months after the last case).***

3. *When a case of FMD is recorded in a disease-free compartment, Art. 8.8.3.*
4. *Countries wishing to recover their health condition should apply for it only when the requirements for this are met. Once a containment zone has been established, its restrictions shall be revoked based on the requirements of this Article only when the disease has been eradicated from this zone.*

For the proper interpretation and understanding of the options and requirements available in Art. 8.8.7, it is important to detail some terms used by the OIE, with special attention to *slaughter, stamping-out policy, emergency* vaccination, *continued vaccination,* signs *of infection* and evidence of viral *transmission.*

According to art's options. 8.8.7, in order to enable the shorter deadlines, *stamping-out policy* represents the main strategy for use at the beginning of animal health intervention, complemented by subsequent surveillance to evaluate signs of *infection* or *viral transmission.*

- ✓ Slaughter: designates the whole procedure that causes the death of an animal by bleeding.
- ✓ *Stamping-out policy:* represents the strategy to eliminate an outbreak and carried out under the control of the veterinary authority, consisting in the execution of the following activities:

  a) **the slaughter** of sick or suspected animals in the herd and, where necessary, in other herds which have been exposed to infection by direct contact with these animals or indirect contact with the causal pathogen; the animals shall be **killed** in accordance with Chapter 7.6;

  b) **the disposal** of dead animals or products of animal origin, as the case may be, by processing, incineration or burial or by any other method described in Chapter 4.13.;

  c) **cleaning and disinfection** of holdings by means of the procedures set out in Chapter 4.14.

As noted, the term slaughter, because it involves bleeding, refers to the slaughter of animals in slaughterhouses, since this procedure for the elimination of animals in rural establishments is not recommended due to operational and biosafety issues. The OIE itself clarifies this point in which, in the definitions of the terminologies of the control measures reported in the WAHIS (World Animal Health Information System) system, it extends the term slaughter to: "kill animals to control the disease and that are intended for commercial use or for own consumption", that is, slaughter with use.

Given the definitions presented, the understanding is that the term *sacrifice* means the slaughter of animals in slaughterhouses, followed by the use of products and by-products, which is similar to the expression sanitary *slaughter,* used in Brazil in some normative acts and technical manuals. In turn, the term *stamping-out policy* is intended for the elimination of animals, whether in rural establishment or even in slaughterhouses (provided that biosecurity measures are guaranteed), not considering their use, that is, with destruction of animals killed by processing, incineration or burial, or any other recognized method for inactivation of FMD virus. Any of these procedures will only be valid when performed under the control and supervision of the SVO. It should be noted that the use of *sanitary sacrifice,* in the case of FMD, presupposes compensation to animal owners, according to the legal norms available, both at the federal and state levels. In this aspect, an important and particular element is animals of proven zootechnical or genetic relevance (e.g., genetic banks or endangered animals) that should be carefully evaluated, seeking alternatives to stamping-out policy, provided that the animals are not infected and there is no compromise of the elimination operations of the region, and the final decision is up to MAPA. Specific actions for this group of animals may involve, for example, more intense clinical and epidemiological investigation, including the use of serological tests and viral research associated with continued surveillance.

The use ***of emergency vaccination*** is also a critical element in the selection of the deadlines for the restitution of the animal health condition defined by the OIE. Its use is optional for the Animal Health condition of free zone without vaccination and, according to OIE mandatory rules for the condition of country or free zone with vaccination. As of 2018, the theme of vaccination became more evident in the Terrestrial Code. Chapter 4.18 - "Vaccination", detailing general questions on the launch, management and closure of vaccination programs; choice of vaccine; evaluation and follow-up of vaccination program; among others. There are also definitions of the main terms used, such as the transcripts below, highlighting that the theme *of emergency vaccination* will be resumed in greater detail in the following item of this document:

- ✓ Vaccination program: plan to implement vaccination in an epidemiologically appropriate proportion of the population of susceptible animals, for the purpose of disease prevention or control.
- ✓ Emergency vaccination: vaccination program applied as an immediate response to an outbreak or increased risk of introduction or outbreak of a disease.
- ✓ Systematic vaccination: routine vaccination program in progress.

Although the term ***continued vaccination,*** used in item 2 of Art. 8.8.7, is not among the definitions available in Chapter 4.18, it should be understood as "vaccination program" or "systematic vaccination", different from an immediate and temporary option such as emergency *vaccination*. Considering this understanding, there is a difference between the option provided for in item 2 of that available in item 1c. The two options involve a period of six months, which can be counted from the last animal submitted to *sanitary sacrifice,* for restitution of animal health condition, and item 2, which provides for the change of status to item 2 free with vaccination, while item 1c provides for the possibility of maintaining animals submitted to emergency *vaccination* in a country or free zone without **vaccination,** *provided that there is no evidence* of *infection* in the remaining vaccinated animals.

Regardless of the chosen option or strategies adopted, the restitution of Animal Health condition depends on the demonstration, through serological surveillance, of absence of *evidence of infection* (country or free zone **without** vaccination) or viral *transmission* (country or free zone **with** vaccination).

As noted, the expression ***signs of infection*** is related to the Animal Health condition of free without vaccination, as ***indications of viral*** [6] transmission, to the condition of free with **vaccination**. This differentiated terminology arose basically from the beginning of the 2000s, due to the frequent registration of outbreaks of FMD in free zones **with vaccination,** located in the Southern Cone region, without clarifying the origin of the cases, leading to the understanding that, in this Animal Health condition, it is impossible to demonstrate the absence of disease *infection*.

[6] Initially, the expression used was "viral circulation", starting with the 24th edition of the Terrestrial Code, 2015, for "viral transmission", seeking to maintain a writing standard for the Code.

The current version of the Terrestrial Code provides only the definition of *infection*, understood as: "the entry and development or multiplication of a pathogenic agent in the body of humans or animals". The demonstration of *transmission* of FMD virus is described in the Chapter of the disease, Art. 8.8.1, item 4, as: "... “in a vaccinated population is demonstrated by change in virological or serological evidence indicative of recent infection, even in the absence of clinical signs.”

The methodological aspects for demonstrating the absence of *signs of infection* or *viral transmission* for FMD are not clearly differentiated in the Terrestrial Code, and it is understood that the evaluation of viral *transmission* is more complex and limited. OIE merely recommends that: "In vaccinated populations, serological studies to demonstrate no evidence of FMD virus transmission should outbreak on animals less likely to have antibodies against non-structural vaccine-stimulated proteins, such as young animals vaccinated a small number of times or unvaccinated animals. In any unvaccinated subpopulation, surveillance should show that there is no evidence of FMD virus infection."

Non-use of *stamping-out policy* strategies and *emergency vaccination* makes the return to a FMD-free condition more time-consuming or even represents a new recognition process to be forwarded and evaluated by the OIE, in accordance with Articles 8.8.2 and 8.8.3. In these last articles, the minimum period required for free condition without **vaccination** are 12 months without disease and infection and without vaccination; and for free with **vaccination,** 24 months without occurrence of outbreaks of the disease and 12 months without evidence of transmission of FMD virus.

Associating the deadlines for restitution of the FMD-free animal health condition to a country or zone with the options for strategies for eradication of infection after a disease outbreak, the OIE, as of the 24th edition of the Terrestrial Code of 2015, included schematic representations involving decision trees for use in emergency actions in FMD. These schemes are summarized in Figures 01 and 02, considering, respectively, the animal health condition of a country or free zone without **vaccination** and of a country or free zone **with vaccination.** They represent summaries of the possible alternatives for Animal Health intervention, helping to identify the best option (or the best path) within the existing reality, considering the deadlines for the restoration of the Animal Health condition and the main strategies available.

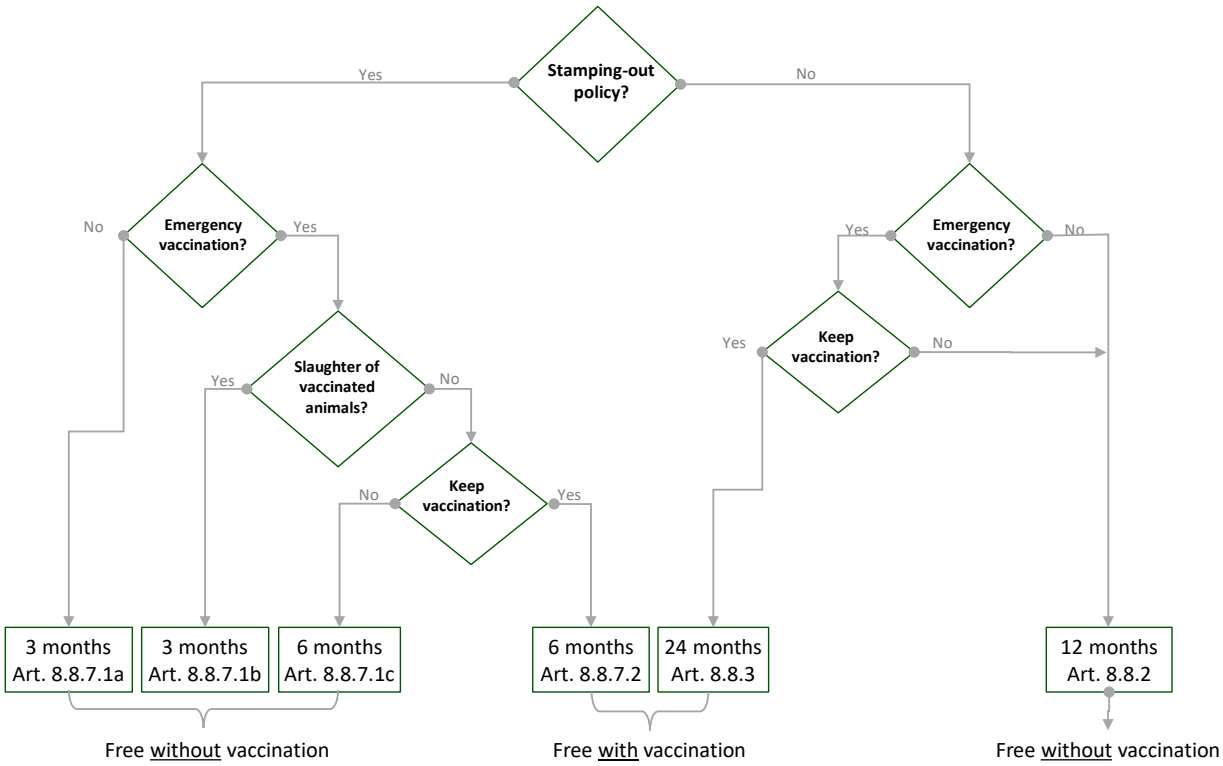


Figure 01. Decision tree to support the definition of the strategy to be used in occurrences of FMD in countries or free zones without vaccination (adapted from the OIE Terrestrial Code, 2019

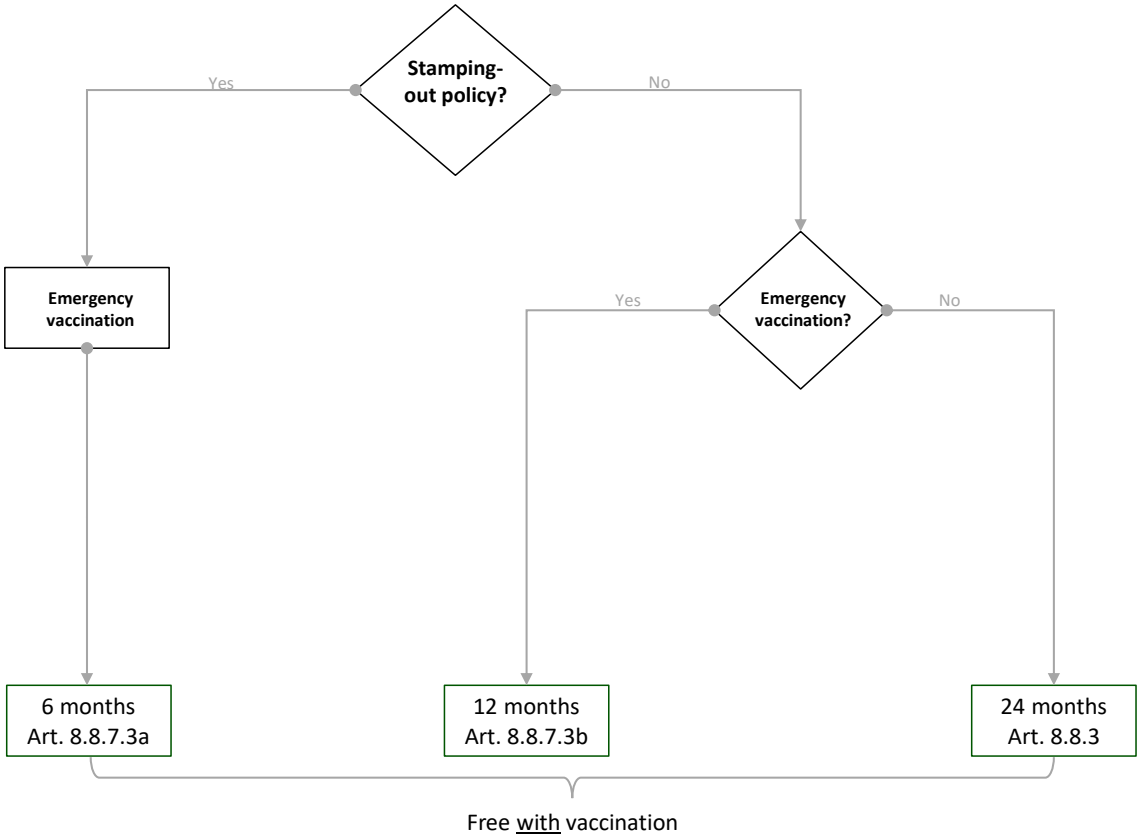


Figure 02. Decision tree to support the definition of the strategy to be used in occurrences of FMD in countries or free zones with vaccination (adapted from the OIE Terrestrial Code, 2019)

The rules and standards presented in the Terrestrial Code are constantly reviewed and updated, reflecting advances in scientific knowledge about animal diseases of economic importance, as well as interests and participations of representatives of economic blocks with the OIE Technical Commissions. Therefore, the professionals involved in the decisions regarding occurrences of FMD should be constantly updated on the subject, including the technical and economic aspects involved. The subject regarding the deadlines for the recovery of animal health condition after occurrences of FMD, especially in a country or zone free of FMD without vaccination, is presented and discussed by Barnett *et al* (2015)[7] and Geale et *al* (2015)[8], which raise important questions. For example, the authors discuss the options for three-month deadlines (option 1b, art. 8.8.7 of the Terrestrial Code, which they call "vaccination-for-death") and six months (option 1c, art. 8.8.7 of the Terrestrial Code, which they call "vaccination-for-life"), when using emergency vaccination in a country or free zone without vaccination. For the authors, the waiting period twice as long for the "vaccination-for-life" strategy is not technically justified, even observing contradictions with other articles of the Terrestrial Code that deal with the exchange of animals and their products at risk for FMD. Among the various points addressed by the authors, we highlight the proposal to replace refund deadlines with procedures and methodologies that can justify and provide those necessary guarantees for proper evaluation by the OIE, with regard to claims for the restitution of the Animal Health condition, regardless of pre-established deadlines.

Clearly, the use of FMD vaccination, either in an emergency or in a systematic and massive way, has consequences for the commercialization of animals and products at risk for the disease, especially due to the limitations regarding the differentiation between vaccinated animals and infected animals and the fears arising from the greater possibility of the subclinical occurrence of the disease and the presence of animals carrying the viral agent. In view of these issues and seeking to support the decision-making on the strategy to be used in the containment of the disease, complementary explanations on *emergency vaccination* are presented.

1.2. Emergency vaccination

Emergency vaccination represents an important technical instrument to contain the spread of acute and high transmissibility diseases such as FMD, especially in free areas without vaccination. The decision for its use, however, requires careful evaluation of the operational issues involved and their economic consequences, which should be considered by state and federal authorities.

As mentioned, the Terrestrial Code defines emergency vaccination as "... vaccination programme applied in immediate response to an outbreak or increased risk of introduction or emergence of a disease" (Article 4.18.2). Therefore, it should be used in herds under threat and with greater predisposition to infection by FMD virus, in this case, due particularly to the proximity to the outbreaks of the disease, with the main objective of reducing the number of susceptible animals and containing the spread of the disease. The expression is mainly used for populations not submitted to systematic and massive vaccination, however,

[7] Barnett P. V., Geale G. C., Clarke G., Davis J., and Kasari T. R., 2015: A review of OIE country status recovery using vaccinate-to-live versus vaccinate-to-die foot-and-mouth disease response policies I: benefits conferred by the use of higher potency vaccines. *Transbound. Emerg. Dis.* 62, 367-387.

[8] Geale G. C., Barnett P. V., Clarke G., Davis J., and Kasari T. R., 2015: A review of OIE country status recovery using vaccinate-to-live versus vaccinate-to-die foot-and-mouth disease response policies II: waiting periods after emergency vaccination in FMD-free countries. *Transbound. Emerg. Dis.* 62, 388-406.

it has also been used to represent vaccination activities in outbreaks that occur in countries or areas where the vaccine is routinely applied, with the aim of increasing existing immunity or providing protection against a strain other than that existing in vaccines used during vaccination campaigns.

As noted in the options of the OIE deadlines for the restitution of the animal health condition in a country or zone free of FMD with vaccination, as discussed in the previous item, in an unclear way, there is **an obligation to use emergency vaccination.** However, in the outbreaks that occurred in the country there was no need to adopt this strategy and, according to the Brazilian experience, this is not the most recommended option, considering the points addressed in the sequence, especially those related to the risks of diffusion of the viral agent and the greater difficulty in demonstrating the absence of viral transmission at the end of the actions to contain the disease. In systematically vaccinated populations, depending on the dates of occurrence of the health event and the stages of vaccination, it is best to carry out the anticipation or reinforcement of vaccination, directed especially to young animals or with a history of few vaccinations.

Emergency vaccination can be named as protective or suppressive. The term "protection vaccination" is used in herds that are close to an outbreak , but have not yet been exposed to the virus, and is related to the objective of "vaccination-for-life", that is, vaccinated animals, in principle, would not need to be destined for culling on the stamping-out policy. Once vaccinated, the animals represent an immunological barrier to the spread of the disease. However, they should be submitted to tests for evaluation of viral transmission, or sent to slaughter, depending on the strategy chosen for the recovery of the Animal Health condition.

The term "suppressive vaccination", in turn, is used for vaccination in outbreaks or in herds at high risk of exposure to infection, in order to reduce the potential manifestation of the virus, recognizing, however, that some animals may be incubating the disease. It is expected, by vaccinating all exposed animals, that those not yet infected have the opportunity for partial protection against clinical manifestation. However, it is accepted, with this, that the infection may be present, and when time and resources allow it, the animals should be killed ("vaccination-for-death"). Regarding the use of vaccination in outbreaks, the following points should be evaluated:

- the presence of animals in the incubation phase of the disease can lead to a discredit regarding the use of the vaccine, since even after vaccination, many animals may manifest the disease;
- in the event of using the stamping-out policy strategy, the use of the vaccine may represent unnecessary costs;
- the movement of animals for vaccination may aggravate the spread of the disease; and
- it can increase the resistance to the slaughter of animals by their owners and the community in general ("*the animal is vaccinated and protected, why should it be eliminated?*")

Therefore, the decision regarding the use of vaccination in animal health emergency actions is complex and involves different issues, such as: degree of dispersion of the disease in the region; level of population immunity for the prevalent strain; species involved; density of the animal population in the affected region; operational capacity for vaccine application; availability of the vaccine, among others. Briefly, some of these points are highlighted and discussed, seeking to support the decision to use emergency vaccination or not:

- The deadlines available in the Terrestrial Code for the restitution of FMD-free zones are subject to proof of absence of infection or viral transmission, through serological surveillance for the detection of antibodies against non-structural protein (PNE). The use of emergency vaccination without subsequent slaughter of vaccinated animals can increase the degree of complexity of the analyses for this proof, hindering or delaying the process of restitution of the animal health condition. Some of the options presented, especially in the case of free zones without vaccination, involve the subsequent slaughter of vaccinated animals. Paton *et al* (2014) [9] discuss alternatives of epidemiological studies after the use of emergency vaccination in the containment of outbreaks of FMD, aiming at the recovery of the animal health condition of free of FMD without vaccination. The authors point out that the demonstration of absence of infection or viral transmission will only prove feasible when the use of emergency vaccination is accompanied by adequate surveillance actions to detect all existing clinical cases.
- Requirement of rapid mobilization capacity by the SVO and availability of structure to perform activities in a short time (human resources, vehicles, equipment, immunogen, cold chain, etc.). The strategy to be used should consider the predominant geographical and agroproductive characteristics in the region, which, in turn, requires the availability of up-to-date and reliable information on the registration of rural properties. Especially at local and state levels, professionals should develop activities, including simulated field exercises, which may help them to answer the following questions: i) considering the different production systems and geographical realities present in the state, what is the average time required to complete the vaccination of a herd?; ii) what is the availability and distribution in the state of cold chains to receive and store large amounts of vaccines against FMD?; iii) what is the average time for vaccine distribution and displacement of vaccination teams in different locations and realities within the state?; iv) how will the identification of animals or herds be carried out, and what is the structure and time for this?
- Vaccination activities lead to the movement and agglomeration of animals, people, vehicles, etc., which may aggravate the risks of spreading the disease and, therefore, should be recommended only when necessary. Depending on the vaccine used and aiming at a more effective result, especially in the case of animals vaccinated for the first time, it may require increased vaccination in a short period of time, involving new movement and agglomeration of animals, people, vehicles, etc. Depending on the locality of the rural properties and the risks involved, vaccination teams should adopt adequate biosafety measures (Attachment 01) for displacement between the different herds to be vaccinated.
- The ideal vaccine for emergency use should have sufficient potency to induce rapid formation of antibodies against the current viral strain, be easy to apply, have adequate level of "purity" in relation to PNE, should not contain live residual viruses and produce a short period of detection of post-vaccine antibodies (Darsie *et al*, 1998-2001). [10] The vaccine used for vaccination campaigns bears its own characteristics of a long-term effect. Thus, before making the decision to use emergency vaccination, it is necessary to evaluate whether the available vaccine meets expectations or if there are conditions for the production, in a short period of time, of the amount of specific vaccine required for the work. The strategy of maintaining vaccine banks for the rapid availability of specific vaccines

[9] Paton, D. J., Füssel, A. E., Vosloo, W., Dekker, A. and De Clerq, K: (2014). The use of serosurveys following emergency vaccination, to recover the status of "foot-and-mouth disease free where vaccination is not practiced". *Vaccine* 32, 7050-7056.

[10] DARSIE, G.C.; REIS, J. L. dos; RAMALHO, A. K. Emergency vaccination of cattle against foot-and-mouth disease. *Bol. Centr. Panam. Foot-and-mouth disease*, 64-67: 26-29; 1998-2001.

should be planned and fully operational. Especially those professionals at the federal level should be prepared to answer questions such as: i) time required to produce a certain amount of vaccine; (ii) time required to bottle the vaccine in vials of different volumes; iii) structure and time required to move large amounts of vaccine to different points in the country.

The production of vaccines from antigen concentrates, which can be formulated at any time from vaccine databases, represents the most accepted strategy in the scientific environment for use in animal health emergencies, which has led some countries, especially those that form the European Union, to develop national or shared vaccine bank strategies. Vaccines prepared from these antigens have been formulated to contain higher levels of antigen (high potency) than conventional prophylactic vaccines.

Studies by PANAFTOSA[10] show that the primary response to the application of aqueous adjuvant vaccine was fast and efficient, providing an average PEP (percentage expectation of protection) acceptable at 7 days and excellent at 14 days after vaccination. Experimental data show that revaccination performed from the 14th day using the aqueous adjuvant vaccine again will lead to acceptable rates for 84 days after revaccination. If a longer period of vaccine protection is required, revaccination with oily adjuvant should be evaluated, as the rates will be kept high for at least 140 days post-revaccination.

- When emergency vaccination is agreed, it should be used starting activities from the exterior to the interior (centripetal form) in relation to the outbreaks (ring vaccination).
- In areas with vaccination, evaluate the rates of vaccination coverage of the previous stages, those animal categories involved and the date of realization of the last stage:
  - if the stage has been performed for more than 90 days, one can choose to vaccinate only vaccinated or newborn animals born after the stage (depending on the type of vaccine used, animals that were vaccinated for the first time during this vaccination should receive a booster after approximately 14 days); and
  - if the stage is scheduled to be carried out in the next 30 days, it may be anticipated, implying vaccination of all animals.

  Note: in either of the two options presented, consider the previous recommendations, especially those related to the risks arising from animal movement.

For example, regarding the elements considered in decision-making on whether or not to use emergency vaccination, there is a summary of some criteria used by the European Union (EU) in Attachment 02. These criteria are published in *Directive* 2003/85/EC of 29 September 2003, maintained in force until 2021, in accordance with Regulation (EU) 2006/429 of the European Parliament and of the Council of 9 March 2016 on transmissible animal diseases and amending and revoking certain acts in the field of animal health ("Animal Health Act"). It is only a support guide with the objective of synthesizing some pros and cons related to the use of emergency vaccination, for joint evaluation by the SVO.

Finally, any decision for the use of vaccination, either of the emergency type or only in anticipation of stages, must be previously communicated and disclosed, in order to avoid speculation or doubts regarding the control of the disease, mainly by the countries and markets with which the country maintains commercial exchange of animals and livestock products. The use of vaccination between strategies for controlling and eradicating FMD, when not properly informed and justified, may generate mistaken understandings regarding the control ability by SVO.

1.3. Containment zone

As discussed in the introductory part of Item 1 of this document, the geographical intervention to contain communicable diseases, such as FMD, is a widely known and consolidated strategy. This geographic strategy has also been used as an important procedure to allow greater safety in the exchange of animals and their products and by-products. Thus, already in the first version of the Terrestrial Code of 1968, the OIE submitted the concepts of free zone and infected zone as alternatives to facilitate the safe trade of products of animal origin, coming from countries with occurrence of certain diseases, including FMD.

The concepts and types of zones have evolved as the international exchange of animal products has been expanded, motivating specific work by the OIE technical committees and *ad hoc* groups and clashes between member countries. In addition, the prospects for the use of free zones as a disease eradication strategy motivated, from 1992 on, the inclusion in the Terrestrial Code of the concepts of zonification and regionalization. The zone and region settings have been entered in Art. 1.4.4.2 of the 6th edition of the Terrestrial Code with the following wording: "A *'zone' is a part of a country delimited for sanitary control purposes. A 'region' is a set of countries, or zones of contiguous countries, delimited for health control* purposes." As of the 13th edition of the Terrestrial Code, in 2004, the concept of "regionalization" has ceased to be considered, as expressed in Art. 1.3.5.1: "*For the purpose of this Terrestrial Code, the terms "zonification" and "regionalization" have the same meaning*". The term "*regionalization*" was definitively removed from the Terrestrial Code as of its 15th edition in 2006. In the following year, mainly due to the reintroductions of FMD in countries or areas free of the disease, which occurred in the mid-2000s, the concept of **containment zone** was incorporated into the 16th edition of the Terrestrial Code, 2007, representing a particular resource of the concept of zoning, currently defined and generally as: *infected zone defined within a previously free country or zone, which includes all suspected or confirmed cases that are epidemiologically linked and where movement control, biosecurity and sanitary measures are applied to prevent the spread of, and to eradicate, the infection or infestation.*

This feature reinforces the relevance of the geographical approach in the care of animal health emergencies and represents an important strategy to reduce the economic and social impacts resulting from the suspension of recognition of the entire country or FMD-free zone, considering that the suspension may be restricted to the said containment zone.

The OIE, through the Terrestrial Code, provides general guidelines on zoning and compartmentalization, in its Chapter 4.4, and specific guidelines for FMD, in Chapter 8.8, with emphasis on Article 8.8.6, entitled "*Establishment of a containment zone within a FMD free country or zone*".

In general, the responsibility for deploying and maintaining an area or compartment lies with the SVO, which should clearly define the animal subpopulation involved in accordance with recommendations in the specific chapters of the Terrestrial Code, including those on surveillance; identification and traceability; and official control programs. According to the OIE, the extent of a zone, and its geographical boundaries, must be established by the Veterinary Authority considering natural, artificial or legal limits, and it should be made public through official channels.

Among the types of zones foreseen by the OIE, in the specific case of the objective of this Contingency Plan, the concepts of **infected zone, protection zone** and the aforementioned **containment zone** is highlighted in Chapter 4.4 of the Terrestrial Code.

The **infected zone** is one where an infection or infestation has been confirmed, and may be: i) an area of a country where the infection or infestation is present and has not yet been eradicated, while other areas of the country may be free, or; (ii) an area of a previously free country or zone in which infection or infestation has been introduced or reintroduced, while the rest of the country or zone is not affected.

The **protection** zone, on the other hand, aims to preserve the animal health status of an animal subpopulation in a country or free zone. It can be established inside or outside a free zone or within a free country, seeking to prevent the introduction of a specific pathogen from adjacent areas with different animal health status. Measures implemented in the **protection zone** include intensified movement surveillance and animal identification and traceability to ensure that animals in that area are clearly separated from other subpopulations. Where the status of the **protection zone** changes, the status of the country or zone in which it was established shall be reviewed in accordance with the specific chapters of the OIE disease list.

As for the **containment zone,** in addition to the general definition already presented, the OIE highlights that it is a specific case of an **infected area,** which can be established to minimize the impact on the rest of the country or free zone, provided that it includes all outbreaks with epidemiological link. Its determination should be based on a rapid response, provided for in a contingency plan, including: i) appropriate control of the movement of animals and products at risk for the particular disease; ii) epidemiological research to demonstrate that all outbreaks are epidemiologically related and contained within the boundaries of the containment zone; iii) implementation of stamping-out policy or other emergency strategy seeking the eradication of the disease; (iv) procedures for identifying the susceptible population in the containment zone allowing their adequate separation from the rest of the population; (v) increased passive or directed surveillance in the rest of the country or zone in order to demonstrate the absence of infection or infestation; (vi) health and biosecurity measures, including continuous surveillance and control of the movement of animals and other risk products and by-products, inside and outside the **containment zone,** to prevent the spread of infection or infestation to the rest of the country or free zone.

Initially, the free status of the country or zone where outbreaks of the disease occurred is suspended by the OIE, being restored after the recognition of the **containment zone.** According to the OIE, for the effective establishment of a **containment zone,** the country must demonstrate one of the following conditions, outlined in Figure 3:

a) absence of new cases of the disease after at least two incubation periods counted from the elimination of the last detected case; or

b) characterize the **containment zone** as an **infected zone** (where cases may continue to occur) separated from the rest of the country or free zone by a **zone without cases,** where there have been no cases of the disease for at least two incubation periods after the implementation of the above control measures.

When there is a case of infection or infestation for which the **containment zone** has been established, either in the **containment zone,** according to option "a", or in the **zone where there have been no cases,** according to option "b", the rest of the country or zone is now considered infected.

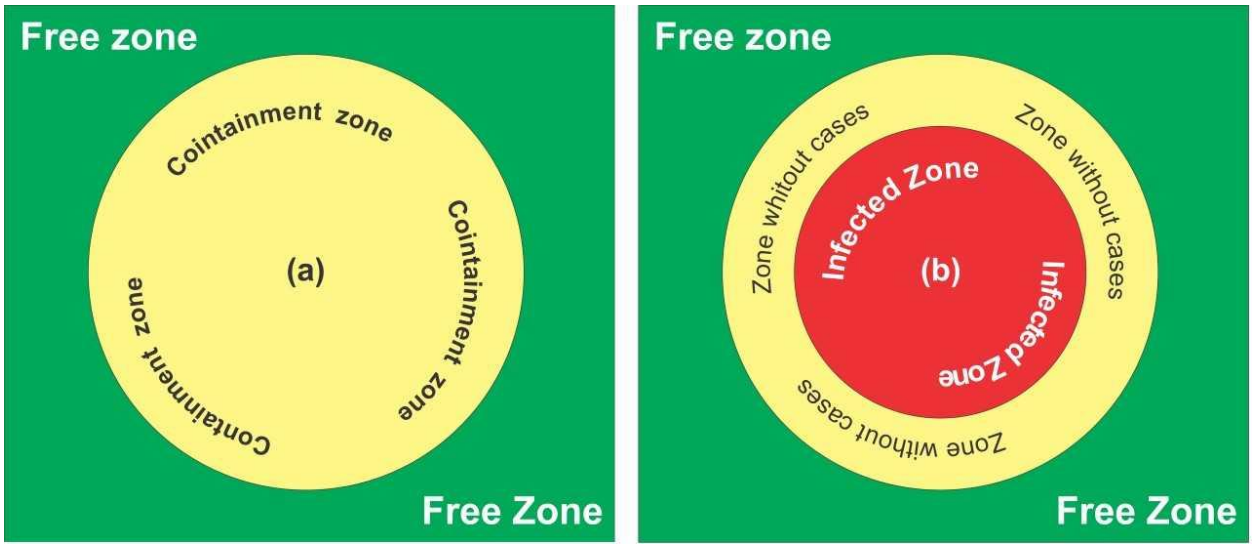


Figure 03. Schematic representation of containment zone options

In addition to the general guidelines presented for the establishment of the **containment** zone, in the specific case **of FMD,** the following conditions, highlighted in Article 8.8.6 of the Terrestrial Code, should be added:

- when suspected, bans were imposed for the movement of animals and risk products from the establishments investigated; **(importance *of the official ban when identifying probable cases);***
- when outbreaks were confirmed, an additional ban was imposed for susceptible animals throughout the **containment zone,** with enhanced control of animal movement and effective controls for the transportation of other goods mentioned in the Terrestrial Code, and considered to be at risk for FMD;
- demonstration that its limits were established through epidemiological investigation (tracking of origins and destinations) that demonstrates the grouping of all outbreaks related by epidemiological link, in limited quantity and distribution;
- research regarding the probable origin of the outbreak;
- implementation of stamping-out policy, with or without emergency vaccination;
- management by the SVO in such a way that it is possible to demonstrate that goods intended for international trade originate outside their geographical limits; and
- the release of the FMD-free condition of the containment zone will occur in accordance with the deadlines set out in art. 8.8.7 of the Terrestrial Code.

In view of the above, in the event of an outbreak of FMD in a country or free zone, those responsible for field intervention should seek the implementation of the **containment zone,** in one of the two modalities described above ("a" or "b"), providing a rapid reduction of the socioeconomic damage involved. In the case of Brazil, about communicable diseases, this is a highly recommended resource, regardless of international or OIE requirements. If this is not implemented, there is the need to demonstrate a technically based justification, since it can show lack of control of the ongoing animal health situation.

2. Confirmation of FMD outbreak and initial actions

In the event of a confirmed case of FMD, the DSA shall inform their immediate superiors and animal health authorities of the pertinent state. It shall also convene the first technical meeting of animal health emergency, involving at least representatives of the specific areas of FMD, information and epidemiology, emergency, transit and animal quarantine. Representatives of the Federal Superintendence of Agriculture, Livestock and Supply (SFA) and the SVS of the state involved may also be convened or participate in meetings, by videoconference.

During the emergency meeting, some actions should be defined to be triggered simultaneously, among which:

1. preparation of circular letter by the Director of the DSA, addressed to all SFAs (including their technical sectors), addressed to the SVS and representative entities of the private sector, confirming the occurrence of an outbreak of FMD in the country, and informing the area of animal health emergency delimited (example in Attachment 03);
2. in order to comply with Decree No. 8,133 of October 28, 2013, prepare a draft of a specific Ordinance to the Minister of State for Agriculture, Livestock and Supply, including: the delimitation of the affected area; indication of the outbreak of FMD; and the term, which shall not exceed one year (model in Attachment 04). The declaration of the animal health state of emergency represents the recognition of a special animal health condition and the definition of a priority of governmental action, justifying the need to use public financial resources quickly, and the involvement and participation of other institutions and governmental agencies such as the civil defense, military police, armed forces, among others. According to the size of the area and the risks involved, the MAPA may request a declaration of emergency situation or state of public calamity, according to the Normative Instruction of the Ministry of Regional Development, no. 02, of December 20, 2016, with consequent convocation of SINPDEC and implementation of a crisis management interministerial office.
3. preparation of a draft ministerial notice addressed to the Ministry of Regional Development, Ministry of Defense and the Civil House, reporting the occurrence of FMD in the country, and requesting the necessary support (example in Attachment 05);
4. preparation of a technical note to support national and international notifications containing a brief report of the events, in addition to the geographical location of the pertinent property with description of its agroproductive characteristics;
5. notify the OIE, Permanent Veterinary Committee of the Southern Cone – CVP, PANAFTOSA, the trading partner countries and all South American countries;
6. indication by the DSA of the coordinators of field operations to be appointed by the Secretary of Agricultural Defense. Preferably, the coordinators should be selected from those professionals who are members of FN-SUASA (National Force of the Unified System of Attention to Agricultural Health), or from another corresponding list. Until the appointment and displacement of these coordinators, the activities of immediate execution in the area of animal health emergency should be conducted with shared participation of those responsible for animal health defense actions in the SFA and in the SVS, or their referral regarding social service veterinarians;
7. draft Ordinance of the Secretary of Agricultural Defense appointing the coordinators of field operations (example in Attachment 06).

Upon detection of a probable case, State emergency disease care groups should adopt initial containment measures according to the available structure, whose members will be incorporated into the Animal Health Emergency Operations Center (COEZOO), detailed in the next item of this document, in specific sectors to be defined by the coordination of field operations. For its implementation, it is essential that all States adequate their own contingency plans to SINEAGRO standards, seeking to maintain the minimum structure necessary according to their geographical and agroproductive particularities.

In parallel with the actions of the Federal Government, the municipal and state authorities involved must be informed and prepared to declare an emergency situation or a state of public calamity according to the guidelines and rules of the Ministry of Regional Development (Normative Instruction No. 02, of December 20, 2016). Additional guidance will be available at PNCEA.

As for the notification of the occurrence to the OIE, it is necessary to follow the recommendations contained in the Terrestrial Code and the WAHIS/OIE system. The notification of the index case must be carried out by the Brazilian Delegate (Director of the DSA) within 24 hours of the confirmation of the occurrence of FMD and, weekly reports should be sent regarding the evolution of health intervention operations. The weekly reports should be sent until the end of the animal health emergency, when a final report should be sent with the conclusions of the intervention.

The information used to prepare the emergency notification and the initial technical note of the DSA is obtained mainly in forms of care for animal health occurrences (FORM-IN, FORM-SV, FORM-COM, FORM-LAB and FORM-VIN), at e-Sisbravet. Thus, the importance of these documents should be highlighted, requiring special attention to the content of these documents during the alert phase, in order to fix any errors and collect additional information, if necessary.

The immediate report to be forwarded to the OIE, in electronic format, requests information such as: precise identification of the agent; laboratory tests used and the laboratory responsible for the result; dates of the first confirmation and onset of clinical signs in outbreak; clinical signs observed; details of the location of the outbreaks (UF, municipality, geographic location - latitude and longitude, also indicated on a map); affected species, indicating the number of susceptible animals, cases and deaths (if any) in each outbreak; description of the affected population; probable source of the outbreak and origin of the infection; and control measures in execution and to be implemented (sanitary slaughter, quarantine, control of animal transit, screening, zoning, vaccination, and biosafety).

Follow-up reports, which are also forwarded to the OIE, should be prepared on the basis of information obtained from the investigation forms, in the case of operations carried out in the outbreaks of the disease, and based on reports of field activities that should keep up-to-date data on the structure and human resources involved in the activities; summary on the progress of the main sanitary measures activities; information on the number of existing and inspected properties in the restricted area; existing total number of susceptible animals; results of investigations conducted on properties with epidemiological link; and information regarding the hypotheses about the origin of the animal health occurrence.

In addition to the initial actions of communication and declaration of animal health state of emergency, the DSA should support the implementation of field operations by the animal health authorities in the UF involved, including measures that allow:

- the analysis of the animal traffic database (Animal Traffic Guide - GTA), identifying properties, municipalities and UFs with entrance or exit of animals from the animal health emergency area, within the last 30 days (and may extend to 60 days if necessary) of the probable onset of animal health occurrence. The list of properties should be immediately sent to the UFs involved for veterinary surveillance activities, including clinical inspections;
- the rapid displacement of specialists (FN-SUASA representatives) to the operations center;
- the implementation of an information system for recording, organizing and analyzing the information obtained during field activities and allowing the rapid communication and transfer of information between the operations center and the DSA; and
- the provision of geographic databases and satellite images in different formats and with different spatial resolutions, to support field activities.

3. Emergency-related legal basis in FMD

The implementation of surveillance and emergency animal health activities requires prior knowledge and mastery of legislation by professionals involved. The authorities responsible for *SISBRAVET* should keep the normative apparatus necessary updated, in order to provide validity and legal support to health intervention procedures that shall be provided by the PNCEA.

Animal Health emergency actions involve principles that regulate the relationship between the State and the private, that is, between the public and private interest. It is common to raise doubts and questions from community representatives, especially regarding the constitutional guarantee for the protection of individual law and complaints about possible illegalities or abuses of power. Often, these actions of democratic law culminate in injunctions or writ of mandamus, and there is need of specific legal support to ensure the prompt reaction of the SVO in containing the animal health emergency. Thus, legal support should be available permanently for both, federal and state spheres, including the coordination of field activities. On the other hand, in order to reduce possible legal obstacles, the importance of media activities and animal health education aimed at clarifying the community about the technical procedures necessary during an animal health emergency is significant, especially those related to the interdiction of properties regarding the traffic of animals, products and by-products of animal origin, and animal stamping-out policy.

Although the regulatory framework is dynamic, undergoing constant adaptations and improvements, the main legal documents of the Federal Government are listed for consideration during animal health emergencies, with emphasis on FMD. In addition to these, other rules in force should be considered at the time of the event, as well as the specific legal basis promulgated by the Federation units.

Decree No. 24,548 of July 3, 1934

Legal document approving the Regulation of the Animal Health Defense Service. Special emphasis should be given to Chapter VI, referring to the prophylaxis of transmissible diseases, and to art. 83, which guarantees free access of official servants, upon presentation of a functional identity card, to places at risk for the diseases mentioned, and the permission to request assistance of law enforcement, if necessary.

Decree Law No. 2848 of December 7, 1940 (Penal Code), including Decrees and Related Laws

Highlighting Article 259 of Title VIII, "Of crimes against public safety", Chapter I, "Of crimes of common danger": *Spreading disease or pest that may cause damage to forest, plantation or animals of economic utility*. It involves imprisonment from two to five years and fine, and if culpable, may have the reduction of detention to one to six months, or fine.

Law No. 569 of December 21, 1948, as amended by Law No 11,515 of August 28, 2007, and regulated by Decree No. 27,932 of March 28, 1950

It deals with issues related to the slaughter of animals, destruction of items or rural constructions, evaluation and compensation to the respective owners. Amended in 2007 included in law § 2º, in Art. 6º, including the **possibility of compensation** resulting from the stamping-out policy of animals , and the Union should bear full costs, provided that the rural properties involved are located in the border strip (150 km wide along the land borders) and that the slaughters result from the performance of sanitary measures to fight or eradicate the FMD. Art. 7 was also updated, coming into force with the following wording: "The right to claim compensation shall prescribe in 180 (one hundred and eighty) days, counted from the date on which the animal is killed, or the item destroyed."

Law No. 9.605 of February 2, 1998 (Environmental Crimes Act)

It provides for criminal and administrative sanctions arising from conduct and activities harmful to the environment. Article 61, referring to the spread of disease or pest or species that may cause damage to agriculture, livestock, fauna, flora or ecosystems, involving imprisonment, from one to four years, and fine.

Decree No. 5,741 of March 30, 2006, which regulates Law No. 8,171 of January 17, 1991, as amended by Law N.º 9.712 of November 20, 1998

Set of legal documents that defines the Unified System of Attention to Agricultural Health with a broad description of the attributions and responsibilities of the different instances and sectors involved. In the case of animal health emergencies, special attention should be given to Sections I and II of Chapter III of Decree 5741 on the eradication and control of pests and diseases. Below, there are some items related to animal health, based on this Decree:

- Operations to contain and eradicate outbreaks of FMD should involve official services and institutions; producers and rural workers, their associations and technicians who provide assistance to them; supervision agencies of professional categories directly linked to agricultural health; and fund management entities organized by the private sector to complement public actions in the field of agricultural defense (§ 1 and 2º, Art. 1).
- The performance of official controls under the Regulation does not exempt participants in the production chain from the legal and primary responsibility to guarantee the health of animals, nor does it prevent the performance of new controls or exemption from civil or criminal liability arising from non-compliance with their obligations (§ 4, Art. 2).
- It is mandatory that all participants notify the SVO stating the names and characteristics of the establishments under their control, which are dedicated to any of the stages of animal production, processing, distribution and veterinary services. The information should be updated whenever there is a significant change in the activities or their eventual closure, as well as any changes in the sanitary conditions registered in their establishments, production units or property (Art. 5).

- Responsibilities and attributions for the preparation of contingency plans, as well as for the coordination, composition and training of specific technical teams for the constitution of national groups of animal health or phytosanitary emergencies (Articles 33 to 36).
- MAPA will adopt emergency and temporary assistance measures in case of non-compliance by the Intermediary agencies with obligations established in the regulations and agricultural health legislation and will take measures that enable them to resolve the situation without jeopardizing the objectives of the Unified System of Agricultural Health Care (§ 1, Art. 112).
- The assistance action referred above may include one or more of the following measures (§ 3 of Art. 112):
    1. the adoption of health procedures or any other measures deemed necessary to ensure the safety of animals, plants, inputs, including feed, animal and plant products, and animal health standards;
    2. restriction or prohibition of placing products on the market;
    3. monitoring and, if necessary, determination of collection, withdrawal or destruction of products;
    4. authorization to use inputs, including feed, products of animal and plant origin, for purposes other than those for which they were originally intended;
    5. suspension of the operation or termination of all or part of production activities or companies;
    6. suspension or cancellation of the accreditation granted; and
    7. any other measures deemed appropriate by the competent authority of the MAPA.
- The burden arising from the actions established above will be the responsibility of producers of animals, vegetables, inputs, including animal feed, and products of animal and vegetable origin, and resource is based, in the form regulated by the MAPA (§ 4, Art. 112).
- Sanctions related to agricultural health will be applied in the form defined in specific legislation, at the federal, state and municipal levels (Art. 113).
- All procedures must be documented (Art. 114).
- In the event of non-compliance with agricultural health standards, producers of animals, vegetables, inputs, including animal feed, animal and plant products, will be formally notified by the competent authority (Art. 115).
- The Intermediary Agencies shall provide mutual assistance upon request, or on their own initiative, whenever the results of official controls involve the adoption of emergency measures in more than one Intermediate Instance (Art. 118).
- Mutual assistance between SVS may include, where appropriate, participation in on-the-spot controls carried out by the competent authority of other Intermediary Agencies (Single Paragraph, Art. 118).
- Whenever an SVS authority becomes aware of a case of non-compliance and this case may have implications for the agricultural health of another state, it will immediately transmit this information to the MAPA and the SVS of the other state, without prior request (Art. 119).
- The SVS receiving such information shall carry out investigations and inform the agency that provided them with the results of the investigations and, where appropriate, the measures taken, in particular the application of assistance, without prior request (§ 1, Art. 119).
- If the competent authorities of the SVS of the states concerned have reason to assume that such measures are not appropriate, they shall jointly seek ways and means of resolving non-compliance (§ 2, Art. 119).
- The SVS will inform MAPA if they are unable to agree on the appropriate measures and if non-conformity affects the animal health system as a whole (§ 3, Art. 119).
- It is verified that non-conformity can affect agricultural health at regional or national level, MAPA will aid, without prior request, in the identified area (§ 4, Art. 119).
- Map will suspend the application of unjustified sanitary or phytosanitary measures, or contrary to agricultural health legislation, between states, adopting relevant measures (Art. 120).

Normative Instruction No. 48 of July 13, 2020

Normative act that defines the main guidelines of the National Surveillance Program for FMD (PNEFA). In the case of animal health emergency actions, Chapter III stands out, "Attendance to suspected vesicular disease and outbreaks of FMD", from Attachment I to said Normative Instruction.

Decree No. 7,257 of 4 August 2010

It provides for the National Civil Defense System - SINDEC, on the recognition of an emergency situation and a state of public calamity, on the transfers of resources for relief actions, assistance to victims, restoration of essential services and reconstruction in disaster-stricken areas, among other topics. Amendments to this Decree were made by Decree No. 7,257 of August 4, 2010, which regulates Provisional Measure No. 494 of July 2, 2010, converted into Law No. 12,340 of December 1, 2010.

Law No. 12,608 of April 10, 2012

Establishes the National Policy for Protection and Civil Defense (PNPDEC); provides for the National System of Protection and Civil Defense (SINPDEC) and the National Council for Protection and Civil Defense (CONPDEC), among other measures.

Normative Instruction No. 01, of August 24, 2012

It establishes procedures and criteria for the decree of emergency situation or state of public calamity by municipalities, states and federal district, and for the federal recognition of situations of abnormality decreed by federative entities.

Normative Instruction No. 50 of September 24, 2013

Amends the list of diseases susceptible to the application of animal health protection measures, provided for in art. 61 of the Regulation of the Animal Health Defense Service, published by Decree No. 24,548 of July 3, 1934.

Law No. 12,873 of October 24, 2013, and corresponding Decree No. 8,133 of October 28, 2013

It provides for the declaration of a phytosanitary or animal health state of emergency, with emphasis on art. 52 of Law 12.873. In addition to several aspects related to the procedures for declaring a state of emergency in the animal health, art. 6° of Decree 8.133, which provides: "Declared the state of phytosanitary or animal health emergency, is the Ministry of Agriculture, Livestock and Supply, as central and superior instance of the Unified System of Attention to Agricultural Health, authorized to import or cancel with the import and grant temporary emergency authorization of production, distribution, marketing and use of unauthorized products, in accordance with art. 53 of Law 12,873, of 2013, provided that the indication of guidelines and measures pursuant to item I of the caput of art. 2nd and the request for prioritization that deals with art. 5th are not sufficient to combat the epidemiological situation."

Decree No. 8.762 of 10 May 2016

It provides for the creation of the National Force of the Unified System of Attention to Agricultural Health - FN-SUASA, which can be used whenever the phytosanitary or animal health emergency is declared, according to the discipline of Decree No. 8.133, of October 28, 2013, or in other cases of proven technical need. The FN-SUASA will be formed by a team of professionals duly qualified and with specific training, representatives of the different instances of SUASA, who will act together in the execution of prevention, surveillance, assistance and control measures of epidemiological risk situations and phytosanitary and animal health disasters that affect crops and herds.

Normative Instruction No. 02, of December 20, 2016

Normative act of the Ministry of Regional Development that establishes procedures and criteria for the decree of emergency situation or state of public calamity by municipalities, states and the Federal District, and for the federal recognition of situations of abnormality decreed by federative entities and provides other measures.

Normative Instruction No. 15 of March 9, 2018

Establishes the National System of Agricultural Emergencies - SINEAGRO, which comprises the set of organs, activities, standards and procedures, with permanent and coordinated action for the preparation and response to agricultural emergencies. It establishes in its organization four levels of performance: I - political-administrative level; II - strategic level; III - tactical level; and IV - operational level.

PART 2

Implementation and management of emergency actions for FMD

1. Introduction

The animal health system, facing an emergency scenario, must react to control and eradication of the disease quickly and effectively, minimizing socioeconomic impact and animal suffering.

The SVO is responsible for the operation and execution of animal health emergency actions. Both public opinion and those involved in the affected production process, especially rural producers, industries, universities, class agencies, among others, will put pressure on the official structure to act quickly and effectively, even proposing agendas of action on when and how to act. That way, the SVO should be ready to act.

The performance in an animal health emergency requires distinct levels of organization and execution: political-administrative, strategic, tactical and operational levels. The first two are equivalent to SINEAGRO Levels 1 and 2 and are not the subject of this document. These levels of the System have as responsibility the publication of the legal framework and the general policies and strategies for cases of agricultural emergency, including the availability of financial resources, the definition of responsibilities and the management of the teams of professionals directly involved.

The tactical and operational levels (equivalent to Level 3 and 4 of the framework of organization and execution of SINEAGRO) represent the coordination and execution of field actions and direct action throughout the surveillance and agricultural emergency system, which, in the case of animal health, is the responsibility of SISBRAVET, and its guidelines are defined in the specific technical-operational Contingency Plans.

Thus, fulfilling the objectives of this document, the following items address the main tactical and operational themes related to the performance in animal health emergency due to outbreaks of FMD. It is worth mentioning that the SVS must keep their contingency plans updated and harmonized in a complementary way to the procedures proposed herein.

2. Animal Health Emergency Operations Center (COEZOO)

For the proper execution of activities to contain and eradicate outbreaks of FMD, there is a need to establish, at the local level of action, a specific and temporary technical coordination. **This temporary structure acts in a complementary way and does not replace the available structures of the SVS and MAPA, which maintain fundamental participation in all animal health emergency action.**

A proposal for the organization of COEZOO is presented in Figure 04. This is an organizational overview, which must suit the geographical and agricultural characteristics of the region, considering the phase of surveillance, the strategies to be adopted, the distribution and number of registered outbreaks and the availability of human, financial and material resources.

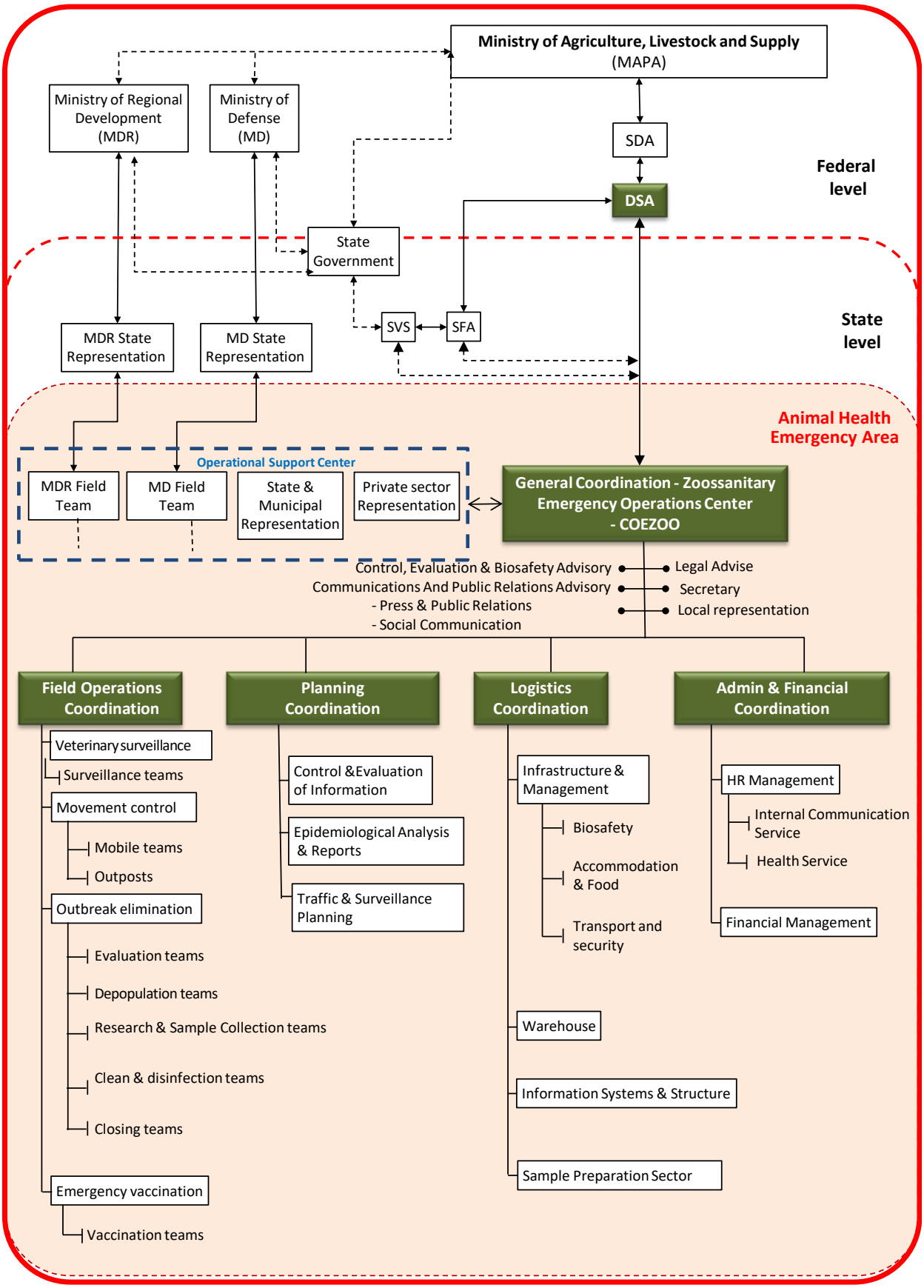


Figure 04. Organization chart proposed for COEZOO coordination

It is important to stress that the isolated performance of COEZOO is unfeasible. There is a need for participation, mainly at the political-administrative sphere, of the structures of the State Government involved (especially the SVS, the Department of Agriculture and law enforcement agencies) and the Federal Government (especially MAPA and its organizational units such as Executive Secretariat, SDA, DSA and SFA), including the specific structures provided for in the PNCEA.

Thus, the proposed organization presents links and connections between the coordination of COEZOO, the federal and state coordination areas and the support structures of the Ministry of Regional Development and the Ministry of Defense. The forms, procedures and norms of relationship between the different levels of coordination of an animal health emergency action, as mentioned, are topics addressed in the PNCEA.

In summary, the previously established hierarchical structure of the SVO should be maintained, with its leaders and coordinators working in harmony and interactively to enable and support COEZOO's actions. The coordination of COEZOO, in turn, should act in close understanding with the institutions and hierarchical organizations, seeking to comply with the established strategies and policies and the defined information flows. At the local level, COEZOO should have an **Operational Support Center,** composed of representatives of different federal, state and municipal institutions and organizations that play relevant roles in the implementation and maintenance of the activities necessary for the conduction of emergency actions. The structures and details of these representations at the local level are specific to each institution and are not part of this Manual. In general, the following institutions should be represented: civil defense, armed forces and public security, private sector, technical assistance and rural extension, as well as public health services.

Specifically limited to the organization of COEZOO, it is proposed to establish a General Coordination, with direct advisory teams (secretariat, legal advice, communication and public relations, evaluation and biosafety, and local representation), and four executing and support coordinations (field operations, planning, logistics and financial administrative) with their respective operational sectors. Considering only the functions of coordinators, advisors and heads of operational sectors, about 20 professionals are needed, a number that will vary according to the stage of animal intervention and the strategies to be used. In any case, the proposal allows the necessary flexibility and adaptation to the various scenarios and circumstances.

The functions, size and number of personnel for COEZOO will depend on several factors, mainly the nature and size of the outbreak, as well as the need for teams for weekly or fortnightly relay. If activity within a sector grows to the point where more than one coordinator is needed, control must be divided and new coordinators appointed, that is, where demand is high, more than one person may be required to coordinate a specific activity. The opposite can also occur, a professional performing various roles or responsibilities. According to the principles of the Incident Command System (SCI), the organization of COEZOO is modular and should grow from base to top by adding more teams as needed and observing the recommended limit of, at most, seven and at least three direct subordinates to the same leadership, dividing or joining teams, if necessary. If human resources are available, one can work with coordinations and sectors in a shared way, which favors the continuity of activities when staff rotation is needed to better distribute tasks.

When teams are about to change a transition period of one or two days, should be provided, during which the team that is leaving the operations will pass on the essential information to the team that is taking over the operations.

In the case of animal health occurrences with greater geographical dispersion, the feasibility of establishing more than one COEZOO should be evaluated, i.e., an independent Operations Center should be established for each emergency geographic area, under the coordination of the DSA.

The performance in animal health emergency can be divided into the following stages: initial intervention; operation or execution; and resolution or conclusion (including communication of the restoration of the animal health condition prior to the onset of the disease, when it occurs). For each of these steps, there is a need for specific organizations and structures, reinforcing the dynamic organizational characteristic of COEZOO.

The initial intervention stage is the most critical, considering the immediate impact of the declaration of the animal health emergency, the initial lack of knowledge of the dimension of the problem, the need for political and strategic definition of the actions to be developed and the difficulties related to the logistics of establishing COEZOO. Therefore, it is not recommended the immediate and simultaneous displacement of many professionals to the animal health emergency area. This displacement should occur gradually, as COEZOO is structured and the need for human resources is settled, remembering that professionals involved in the activities of the Alert Phase should already be present , especially those focused on the surveillance of herds in properties bordering the outbreak area or linked to it by movement of animals, people, objects and risk products.

Initially, the displacement should be limited to the COEZOO coordination team, with the immediate objective of making the first contacts with local authorities and representatives, aiming at communicating about the work to be done and identifying the location for the implementation of the operations center. The team should also seek alternatives for accommodation and provision of food for the teams of professionals who will work in the field activities.

Once the initial organization stage is completed, the professionals should be moved to the different technical activities, giving priority to the following teams:

1. Teams from the Outbreak Elimination Sector, with emphasis on the evaluation team;
2. Teams of the Epidemiological Analysis Sector, seeking to quickly initiate the procedures for organizing and analyzing information, in order to support the definitions on the location of fixed posts and on the priority of rural properties for surveillance and the number of teams needed for the work;
3. Teams from the Traffic Control Sector, especially those directed to fixed inspection posts; and
4. Teams of the Sector of Social Communication in Animal Health, to start the activities of clarification to the local community, about the actions to be implemented.

Subsequently, the complementary teams of veterinary surveillance and laboratory support should be arranged. In the event that the chosen strategy includes the use of emergency vaccination, the teams involved should be displaced only from the definition of the scheme and procedures to be used and the availability of the vaccine to be used.

In the constitution of the teams working in animal health emergency, it should be highlighted the importance of the inclusion in COEZOO of technicians from the local and regional veterinary units of the area involved, who will provide knowledge and information about the region and its productive system of great value for emergency management. They should also readily make available the information provided for in the initial recommendations of the **Vesicular Disease Research Manual.**

For better identification of the teams, one should use the different colors to separate the teams. Some colors are suggested to use in the following Table.

Colors for identifying teams

COEZOO sectors and teams with and without contact with suspects	Colors
Coordinators	blue
Surveillance teams - no contact with outbreaks	green
Surveillance teams - in contact with outbreaks or suspicions	red
Traffic control teams	yellow
Elimination teams	red

2.1. *Characteristics, attributions and general responsibilities of COEZOO*

As mentioned, COEZOO is the core where the group responsible for operations within the animal health emergency area operates, composed of coordination and techno-operational and administrative sectors.

Its assembly is part of the initial attributions of the coordination team, remembering that it is the responsibility of the state department of emergency disease care to carry out previous surveys and studies on possible locations for the implementation of the center, based on the local registrations and action plans maintained at UVLs.

To this end, the General Coordinator, with the support of the state and municipal authorities involved and representatives of the agricultural sector, should define the location for implementation of COEZOO, reinforcing the following characteristics:

- have basic services, energy and water facilities;
- be located preferably within the emergency area, but not in the zone of outbreak and peripheral outbreak area, and away from urban centers, since it involves large movement of vehicles and people;
- have enough space to accommodate at least independent rooms for the General Coordination of COEZOO, technical meetings, Epidemiological Analysis Sector, a place to address the community and a warehouse place.
- have telephone lines, internet, wireless network and structure for computer installation;
- provide security conditions;
- offer biosafety conditions: enable the control of entry into the enclosure and the implementation of sanitizing “feet bath” and “wheel bath” and have a large patio that allows the parking of the fleet of vehicles (it must be a fenced place);
- have space and facilities for the implementation of a cleaning and disinfection central for the clothes and equipment used in field activities (provide for the installation of washing machines and dryers);
- have space for the implementation of a sample reception center for diagnosis, with emphasis on the possible need to collect a large number of serological samples for infection evaluation or viral transmission (predict closed site, with the possibility of implanting benches, centrifuges, refrigerators and freezers); and
- provide for appropriate location and containers for collection and disposal of the generated infectious material, subject to all biosafety measures.

If it is not possible to identify a single location to meet all needs, one should consider the alternative of distributing the sectors in different locations.

Special emphasis should be given to the distribution and location of the different units and sectors within COEZOO, highlighting two main points: biosafety and accessibility. In this way, cross-access should be separated or prevented between "dirty" areas (e.g. sample reception site, cleaning and disinfection areas, vehicle entry and exit sector) and "clean" areas (e.g. control rooms, meeting rooms and administrative sectors), as well as identifying areas of increased flow, such as warehouse and sample receiving sectors , keeping them located at points of easier access and control. Preferably, one should also establish a one-way flow of people and vehicles, thus avoiding "cross-contamination".

A specific theme of fundamental importance for the proper conduct of the work, refers to the availability in COEZOO of computerized system for recording the data and information produced during the activities involved, as well as for the rapid consolidation of data, analysis and flow of information. As mentioned in item 1 of Part 2 MAPA of this document, it is MAPA's responsibility to make this system available, and it is the responsibility of each operational sector to enter the data recorded during the activities involved. Each operating sector, therefore, must have access to the system and take responsibility for keeping it up to date. In the specific case of the forms used to record field activities, one can opt for a centralized process of entering the information into the system, making equipment and manpower available in an appropriate amount.

Regarding the behavior and general responsibilities of the teams involved in animal health emergency activities, the following stand out:

- knowledge and zeal in complying with the guidelines present in the Contingency Plans and technical manuals involved, with emphasis on biosafety measures;
- teamwork conduct, avoiding individualistic actions and disaggregating behaviors;
- quality in the recording of the activities performed, keeping updated the reports and forms requested; and
- care and zeal in the conservation of equipment used in emergency activities.

2.1.1. COEZOO General Coordination

The General Coordinator is responsible for the execution of activities in the area of animal health emergency, accounting for all actions. As initially mentioned, it should be appointed by the SDA. You must be a veterinarian in the official service and have experience in animal health protection. Until the appointment of this professional and their displacement to the animal health emergency area, the heads of animal health services in the SFA and the SVS should assume the initial responsibilities of the General Coordination of COEZOO or appoint their representatives.

Among the responsibilities and duties of the General Coordination, the following stand out:

- seek to meet operational objectives during animal health emergency;
- follow the guidelines and strategies defined with national and state authorities, aiming at the rapid containment and eradication of the disease;
- define the extent of the epidemic, from the investigations and outbreaks identified, establishing the containment zone according to international requirements;
- support investigations to identify the origin of animal health occurrence;
- coordinate the implementation and administration of COEZOO;

- designate the team of professionals to compose the other coordination and operational sectors of COEZOO, giving priority to the professionals of the SVS, the SFA, participants of the state group of animal health emergency and the FN-SUASA. The General Coordination may suspend, from the activities of animal health emergency, professionals who, in some way, are not complying with the responsibilities and the established conducts;
- manage the outbreak elimination operations;
- maintain integration with other authorities at the federal, state and municipal levels;
- define, within the animal health emergency area, the criteria and procedures for issuing specific documents to control the movement of animals and products at risk for FMD, as well as for the other animal health measures involved;
- coordinate the activities, with the support of the other institutions and organizations involved;
- evaluate the progress of control and eradication actions and the epidemiological situation in the area of animal health emergency;
- ensure that surveillance, control and eradication actions are following the precepts of animal welfare;
- maintain the flow of information to the other national and state levels of coordination; and
- request and monitor the use of emergency care resources for small eventual expenses, necessary for the maintenance of animal health emergency actions, such as corporate card.

To carry out its activities, the General Coordination must have a direct advisory team and maintain daily, fast and objective meetings, with its coordination and support team. Eventually meetings should be held with all components of the animal health emergency.

Meetings must have start and end times and be held with the coordinators first and then with the support team or with a specific group that needs to resolve a problem.

The direct advisory structure should cover the legal, communication, control and evaluation areas, whose main characteristics and responsibilities involves:

Legal Advice:

It must be represented by civil servants(s) with training in law and specific knowledge in the areas of public law and animal health protection legislation.

Main responsibilities:

- provide legal basis for field team operations during animal health emergencies;
- represent COEZOO in legal situations;
- prepare, review and approve, from a legal point of view, documents necessary for the execution of activities during all stages of the animal health emergency; and
- organize and coordinate service structure for opening indemnification processes to rural owners due to animal health emergency activities.

Communications and Public Relations Advisory:

Press and public relations sector

Preferably should be represented by a professional with training in the area of communication or veterinary doctor with experience in the area.

Main responsibilities:

- coordinate press releases and produce clarification materials related to animal health emergency activities;
- plan, develop and maintain activities for the public dissemination of animal health emergency activities; and
- assist the General Coordination in communicating the risks to public health, animal and environmental health involved.

Animal Health Social Community Sector

Its main objective is to work with the local community to clarify the animal health emergency actions and seeking support and participation in the activities involved. It should include veterinary medical professionals with experience and knowledge in the areas of education and media in animal health, highlighting the following responsibilities:

- program participation with local media and target audience concentration points;
- produce complementary educational material for distribution to the local community; and
- inform the channels that the population should use to report suspected FMD.

Control and Biosafety Advisory:

It should be conducted by veterinarians of the official service with experience in control or evaluation of animal health programs, especially FMD, specific knowledge about the clinic, pathology and epidemiology of FMD, as well as biosafety, and integrate the national group of animal health emergency. It is recommended, at least, two professionals who will play the role of auditors of the operation, responsible for the criticism and evaluation of emergency activities, reporting them to the general coordinator of COEZOO. They should monitor all meetings and actions at COEZOO, pointing out the deficiencies, aiming to improve the employment of personnel and material and the results of the operation.

Main responsibilities:

- provide technical advice to the COEZOO General Coordinator;
- supervise and evaluate the execution of the activities of the operational sections and their field teams, verifying if the execution of the procedures complies with instructions provided in the Contingency Plan and specific technical manuals, as well as with animal welfare precepts;
- supervise compliance with biosafety controls (activity intrinsic to all sectors);
- establish perimeters, structural and isolation conditions for COEZOO security, making sure that they do not pose risks to teams and material resources;
- verify safety and hygiene conditions in the activities of the participants, verifying that the practices employed do not pose risks to the teams;
- analyze the structural conditions of workplaces;
- verify the probabilities of damage to the environment in COEZOO activities;
- assist in establishing the boundaries of clean and dirty areas in COEZOO, observing the procedures established to avoid contamination; and
- coordinate vehicle parking lots and their operation safely.

Local representation:

It should be filled in by local representatives of the affected area, including preferably SVS veterinarians responsible for UVLs directly involved in animal health emergencies. When possible, insert veterinarians from the municipal departments of agriculture. The role of these professionals is to support the General-Coordinator of COEZOO and support the other coordination teams, considering their specific knowledge about local realities. It is recommended that these professionals do not assume coordination or leadership responsibilities at COEZOO, in order to avoid possible conflicts or difficulties in their daily lives with local communities.

2.1.2. Administrative and Financial Coordination

It must be filled by a civil servant with experience in administrative and financial management. Among its main attributions, the following stand out:

- support COEZOO management by coordinating subordinate operational sectors;
- manage emergency resources for small eventual expenses, necessary for the maintenance of animal health emergency actions; and
- maintain a registration system and database on human and financial resources involved in the animal health emergency.

To carry out its activities, the Administrative Coordination has two sectors: Human Resources Management (HR) and Financial Management, whose activities and responsibilities are:

HR Management Sector

It must be filled by a civil servant with experience in human resources management. Its team includes the areas of internal communication and health service. For the latter, it is important to have the presence or availability of a doctor and psychologist.

Among the main activities and assignments, including the specific areas, the following stand out:

- ensure the registration and control of human resources participating in the animal health emergency action, keeping an organized list contemplating identification, function, activities, allocation, telephone, e-mail, etc.;
- welcome and guide newly entered personnel in the animal health emergency action, in matters concerning administrative and operational aspects of COEZOO;
- ensure the internal dissemination of information for motivation, clarification and guidance of human resources involved;
- maintain specific locations for the dissemination of information, such as murals and bulletin boards;
- prepare administrative bulletins of interest to teams involved in animal health emergency and certificates of participation;
- enable the exchange of administrative and personal information between animal health emergency teams;
- ensure prompt medical and psychological care, full-time;
- maintain planning of medical care and prevention of occupational accidents during the animal health emergency;
- establish activities of integration and motivation of the human resources involved;
- guide on safety and health procedures of professionals during animal health emergencies;
- keep track and investigate all medical occurrences during animal health emergencies.

Financial Management Sector

It must be occupied by a civil servant with experience in public financial resource management. Where financial resources from private animal health emergency funds are used, the managers of those funds should appoint qualified professionals to also make up this sector. Among the main activities and attributions, the following stand out:

- organize and control the documentation necessary for recording and accounting for the resources used;
- keep updated spreadsheet of budget and financial control and forecasting expenses necessary for prompt use by the teams of other coordinations and sectors of COEZOO; and
- keep up-to-date list of suppliers of materials and equipment.

2.1.3. Logistics Coordination

It should be filled by a professional, preferably, with experience in administrative and financial management. If private funds are used, it shall include a professional appointed by the management group of such funds. Among its main attributions, the following stand out:

- support COEZOO management by coordinating the subordinate operational and support sectors;
- manage emergency resources for small eventual expenses, necessary for the maintenance of animal health emergency actions, according to procedures and controls defined by the Administrative and Financial Coordination; and
- maintain a registration system and database on the activities developed.

To carry out its activities, the Logistics Coordination has four sectors: Infrastructure and Management of COEZOO, Warehouse, Information System Structure and Sample Preparation Sector, whose activities and responsibilities are highlighted in the sequence.

COEZOO Infrastructure and Management Sector

The head of this sector must be an SVO professional with experience in administrative management. In your team should participate professional with knowledge of cleaning /disinfection procedures and use of chemicals.

Its activities are grouped into four subsectors (cleaning/disinfection; accommodation/food; transportation; and safety), highlighting the following main attributions:

- ensure the proper functioning of COEZOO and support the implementation of animal health emergency actions;
- work closely with the Field Operations Coordination;
- ensure the supply of additional electricity in case of need (generator set);
- ensure the maintenance of equipment used in the animal health emergency, with emphasis on availability and maintenance of vehicles;
- keep in operation the system of cleaning and disinfection of vehicles, as well as compliance with biosafety procedures by field teams when joining COEZOO;
- ensure the washing and disinfection of clothing, footwear and equipment used in animal health emergency actions;
- ensure maintenance of COEZOO cleaning, including the correct collection, handling and disposal of waste from operations during the animal health emergency;
- enable accommodation and feeding for the teams involved in the animal health emergency; looking for accommodations near the site of field operations or alternatives within COEZOO itself, including sanitary facilities;
- ensure food, accommodation and sanitary facilities in outposts, including fixed outposts and mobile teams; teams in outbreak and other remote locations;
- control vehicle uses and fuel availability; and
- ensure the presence of security public force for COEZOO and field operations during the animal health emergency when requested by the General Coordination, with emphasis on fixed inspection posts, mobile teams and veterinary surveillance.

Warehouse Sector

It should be composed, preferably by a SVO professional, with experience in warehouse management.

Among its activities and main attributions, the following stand out:

- to survey the needs and maintain the ready supply of inputs, equipment and materials necessary for the internal activities of COEZOO and for field operations during the animal health emergency, remembering that it is part of the responsibilities of the state emergency groups, maintaining a list of needs of inputs and equipment for performance in animal health emergencies. As mentioned, the location of the warehouse should allow easy access by field teams and provide security in the storage of the products and materials involved; and
- maintain registration system and database for inventory control and use of permanent and disposable equipment.

Structure and Communication System Sector

It must be filled in by a professional with experience in telecommunications and information system.

Among its activities and main attributions, the following stand out:

- Provide telecommunications equipment and structure within COEZOO and for animal health emergency actions, including the installation and management of communication network (telephone, Internet, Intranet, radio, etc.); and
- establish and manage *backup* procedures to ensure data and information security.

Sample preparation sector

This must be under the responsibility of a professional with experience in the specific area, including training in the procedures of packaging and sending samples, and rely on a support team for the activities of receiving (conference and evaluation); identification; packaging; storage; shipment; daily record and maintenance of files in an organized and proven way, which allows traceability. It will be up to the direct responsible to distribute activities among the support team and should consider the work experience and profile of each professional. Depending on the demand and the number of people involved, there may be overlapping responsibilities as long as there is no damage to the progress of the work. Key assignments include:

- organize and manage the structure in COEZOO for receiving, organizing, storing and preparing samples for shipment to the laboratory;
- define and inform the demand for human resources, inputs, materials and equipment necessary to carry out its activities;
- contribute to the maintenance of stock in the warehouse of material and input for sampling for prompt use of field teams;
- maintain materials and equipment necessary for the preservation of samples and proper disposal of biological risk material;
- maintain close contact with laboratories defined for laboratory testing;
- support field teams regarding the procedures for collecting, identifying, packaging and conserving samples; and
- ensure the proper registration of all activities and their inclusion in the information system provided.

2.1.4. Field Operations Coordination

It must be under the responsibility of a veterinarian of the official service, with experience in animal health defense, especially FMD. Among its attributions and responsibilities, the following stand out:

- support the management of COEZOO, coordinating and guiding the subordinate operational sectors, ensuring the adequate supply of conditions and materials for animal health emergency actions and acting in close harmony with the other COEZOO Coordinations;
- ensure compliance with the standards and procedures defined by the General Coordination, relating to the execution of activities in the area of animal health emergency;

- ensure compliance with contingency plan guidelines and technical manuals by subordinate operational sections;
- provide technical advice to the COEZOO General Coordination;
- keep teams up to date with regard to knowledge of the strategies in progress and progress of operations within the different subordinate operational sections;
- ensure that the new teams, when entering the animal health emergency actions, are informed and prepared to carry out the specific activities for which they are designated; and
- establish daily the routine of the activities of the subordinate sectors based on the analysis of epidemiological investigations, in conjunction with the Planning Coordination.

In order to carry out its activities, the Field Operations Coordination should have four specific operational sectors, according to the phase of the animal health emergency, highlighting, subsequently, the responsibilities that should be performed by veterinarians of the official service, with experience in animal health defense.

Outbreak Elimination Sector

Its specific responsibility is to act in the identified outbreaks, seeking the application of the agreed procedures and strategies. It should set up specific evaluation teams; depopulation; investigation and sampling; cleaning and disinfection; and closure. The person responsible for this Sector must have participated in training activities in animal health emergencies and, specifically, the evaluation team should be appointed by ordinance (Attachment 7), including veterinarians from the SFA and the SVS, as well as representatives of the productive sector, according to specific legislation. Below are the attributions of the Sector and its specific areas:

- manage the performance in the outbreaks of FMD, seeking the rapid control and eradication of sources of infection, including activities of evaluation, stamping-out, disposal of carcasses, cleaning/ disinfection, sanitary void and introduction of sentinels, according to the agreed strategies;
- define and inform the demand for human resources, inputs, materials and equipment necessary to carry out its activities;
- ensure the recording of data and information for investigation of outbreaks of FMD;
- ensure the performance of clinical inspection and collection of samples for laboratory tests, aiming at better knowledge about the dispersion of the viral agent and the epidemiological characteristics of the disease in each identified outbreak;
- ensure the audiovisual record of the activities carried out, whenever possible; and
- ensure the proper registration of all activities and their inclusion in the information system provided.

Veterinary Surveillance Sector

Responsible for investigations in establishments with susceptible animals or products at risk for FMD. Surveillance teams should be subordinated to this sector in an amount appropriate to the geographical and agricultural characteristics of the animal health emergency area. These surveillance teams must be composed of at least one veterinarian with full knowledge of the **Vesicular Disease Investigation Manual,** in addition to technical assistance to support the activities. Among the tasks and responsibilities involved, the following stand out:

- coordinate the implementation of epidemiological investigation activities in rural properties and other establishments with animals susceptible to FMD in the area of animal health emergency;
- coordinate the distribution of field teams according to the different areas of epidemiological risk;

- manage the achievement of epidemiological investigation targets, including the frequency of inspection of rural properties, according to the different areas of epidemiological risk;
- ensure immediate notification of confirmed cases of vesicular disease, as well as compliance with the guidelines of the **Vesicular Disease Investigation Manual,** provided for this case;
- ensure that the completion of the investigation forms is complete, accurate and clear, as well as their immediate insertion in the information system;
- identify and communicate the needs of materials, equipment, inputs and human resources necessary for veterinary research activities in the emergency area;
- ensure that surveillance teams comply with the planned epidemiological investigation activities and procedures, including biosafety measures and guidance to farmers on prevention and restriction measures imposed in the area of animal health emergencies;
- evaluate and propose appropriateness for investigation activities in the animal health emergency area; and
- ensure the proper registration of all activities and their inclusion in the information system provided.

Movement Control Sector

Responsible for the control and supervision of the movement of animals and risk products, including fixed posts and mobile teams. Among the attributions, the following stand out:

- develop and execute inspection plans, including locations, flows and periods of greatest risk;
- Identify and communicate the needs of materials, equipment, inputs, and human resources needed for inspection.
- enable and coordinate the implementation of outposts inspection and the strategic use of mobile teams of inspection;
- manage all procedures relating to the movement of animals and risk products for FMD, including the issuance of documents established for the animal health emergency area;
- comply with the inspection procedures and, in conjunction with the Logistics Coordination, ensure the uninterrupted operation of surveillance structures, including availability of human resources, food, accommodation, supplies, structure, equipment and police support;
- evaluate and propose adaptations to the activities and standards of supervision of the movement of animals and risk products, vehicles, people, and objects that can carry the infectious agent; and
- ensure the proper registration of all activities and their inclusion in the information system provided.

Emergency Vaccination Sector

This sector should be implemented when the action strategy involves emergency vaccination. Among the activities and responsibilities involved, the following stand out:

- develop operational vaccination plan, including methodology to be used, estimated time for its execution and demand for human resources, inputs, materials and equipment necessary to carry out its activities;
- ensure adequate conditions for the conservation, distribution and application of FMD vaccine;
- ensure adequate biosafety conditions in vaccination operations; and
- maintain a registration system and database regarding the information produced during its activities.

2.1.5. Planning Coordination

It should be under the responsibility of a veterinarian of the official service, with experience in epidemiology, especially for FMD. Among its attributions and responsibilities, the following stand out:

- ensure compliance with contingency plan guidelines and technical manuals by subordinate sectors;

- provide technical advice to the COEZOO General Coordination;
- articulate with the Coordination of Field Operations to define the activities of surveillance and traffic control;
- recommend the definition and adequacy of epidemiological risk areas and surveillance strategies and places for action;
- define a strategic research and surveillance plan, including locations, flows and periods of greatest risk;
- maintain and manage the information system to control animal health emergency activities;
- ensure the timely presentation of technical reports regarding the progress of operations; and
- keep teams up to date with knowledge of the strategies in progress and progress of operations within the different subordinate operational sections.

To carry out its activities, the Planning Coordination must have three specific sectors: control and evaluation of information; epidemiological analysis and report; and traffic planning and surveillance. These three sectors should work closely together.

In addition to the technical characteristics necessary to answer for each sector, the responsible person must count on the support of professionals in the area of epidemiology, information systems, including preparation and analysis of databases; and knowledge in the use of statistical applications and geographic information systems (GIS). The organization of its activities should include control teams and evaluation of information, epidemiological analysis and epidemiological report. Among the responsibilities and attributions involved, the following stand out:

- define and inform the demand for human resources and equipment necessary to carry out their activities;
- manage the registration and storage of data related to animal health emergency activities;
- consolidate and analyze the data of the forms used in animal health emergency activities;
- provide information to support the definition of the animal health emergency area and the establishment of epidemiological risk areas, as well as the containment zone;
- electronically obtain and organize all available data and information about the emergency area, seeking to elaborate rapid geographic and agroproductive characterization in order to support the implementation of other control and surveillance activities;
- perform analyses and produce epidemiological information necessary for the management of animal health emergency actions, including the establishment of control and eradication strategies, location of fixed posts; distribution of mobile teams; as well as the definition of surveillance priorities;
- conduct continuous assessment of the risk of spread of FMD, in order to support the urgent identification and screening of cases and contacts;
- perform analyses to determine the primary outbreak, including probable origin and transmission mechanism of the infection;
- perform analyses to support the determination of the pattern of disease dispersion;
- prepare bulletins and periodic reports on the epidemiological situation in the area of animal health emergency, with emphasis on the information necessary to subsidize international reports;
- elaborate maps, graphs, tables and other forms of presentation and communication of epidemiological information;
- support general coordination in the holding of technical meetings for the management of animal health emergency actions; and
- ensure the proper registration of all activities and their inclusion in the information system provided.

3. Guidance on technical activities involved in the containment of outbreaks of FMD

3.1. *General issues*

The strategy for the eradication of outbreaks of FMD in a country or free zone is based on the destruction of infected animals and their direct and indirect contacts to eliminate the virus from the environment. In addition, emergency vaccination can be used in strategic areas and the preventive slaughter of healthy herds, defined by proximity or epidemiological link, to decrease the number of susceptible animals in the area and temporarily control the spread of the virus until measures of destruction of probable sources of infection have been able to eliminate the presence of the viral agent in the animal health emergency area.

Effective eradication depends on the rapid identification of herds exposed to the virus for the destruction of any infected or potentially infected animal and all contaminated or potentially contaminated material. Rapid decontamination of the environment and vehicles and other objects should be sought to prevent the spread of the virus and recover the animal health condition as soon as possible.

The basic principles used for the eradication of an exotic disease are:

- prevent contact between susceptible animals and the infectious agent (interdiction and traffic control);
- stop the elimination of viruses by infected animals (destruction); and
- reduce the number of susceptible in the area (emergency vaccination and preventive slaughter).

The practical application of these basic principles for the control and eradication of FMD implies:

- eliminate sources of infection by the destruction of sick animals and their direct and indirect contacts within the outbreaks, with destination of carcasses by burial or incineration *(sanitary slaughter);*
- stop the spread of the infection by prohibiting the movement of livestock and restricting the movement of vehicles and people within the animal health emergency area. This measure should be continuously reviewed to suit different areas of epidemiological risk as new information is incorporated;
- eliminate the virus by decontaminating facilities, vehicles, equipment and materials or by disposing of contaminated material;
- adopt measures involving preventive slaughter of animals known to be exposed before they can manifest clinical signs of the disease, if necessary;
- investigate all movement of susceptible animals, objects and vehicles into and out of properties with infected herds (outbreaks) occurring from at least 30 days before the probable start of the health event;
- investigate all suspicious herds performing clinical, viral or serological evaluation; and
- improve the immunity of herds with emergency vaccination if necessary.

As FMD is a highly contagious disease, dissemination can only be interrupted by the rapid destruction of sick animals and the suspension of movement in the emergency area. The destruction strategy should prioritize the clinically affected herds within the outbreaks to suppress the multiplication of the virus and then move on to herds known to be exposed or with clear evidence of epidemiological linkage.

Preventive slaughter can be performed in herds that have been known to be exposed by direct or indirect contact and when there is some type of carcass use in the emergency area.

Epidemiological investigation should track all properties linked to the outbreak by direct or indirect contact from at least 30 days before the probable start of the health event. Epidemiological investigation with its ramifications should be carried out immediately to delimit in detail the animal health emergency area, in which quarantine should be established on all properties with susceptible animals. As an initial strategy, the emergency area can be defined by the total area of the municipalities affected by the 25 km radius traced from the index outbreak, appropriate to the geographic and agroproductive reality found.

The use of emergency vaccination depends on a careful evaluation that should consider the previous immune condition of the herds in the area. Animals vaccinated during the emergency campaign should be identified for further control of movement or slaughter according to the strategic definition adopted.

The key to deciding on the use of emergency vaccination depends on the ability to estimate the rate of disease dispersion and the rate of contact between susceptible animals. Suppressive vaccination is performed in the area considered infected or at high risk while preventive vaccination should be performed in the remainder or part of the emergency area.

A decontamination strategy should be established due to the possible persistence of the virus in the environment. Places where FMD has been confirmed, as well as vehicles and equipment, should be thoroughly cleaned and disinfected. Organic matter prevents the action of disinfectants, so cleaning before disinfection is necessary. If there is no possibility of effective and rapid disinfection, contaminated material, equipment and facilities must be destroyed. Secretions and excretions of animals must be buried, incinerated or composted.

Within the animal health emergency area, areas of differentiated risk and specific surveillance strategies should be defined, considering the implementation of fixed posts, the distribution of mobile teams and surveillance teams. The emergency area should evolve to meet the concept of containment zone presented by the OIE.

The surveillance strategy and decision-making on eradication actions should consider:

- the nature of the livestock activity of the affected establishments;
- species involved and their densities;
- number of contacts of the initially infected herds;
- estimation of the geographical extent and duration of the epizootic;
- predominant agricultural production systems in the emergency area;
- existence of natural physical barriers;
- available for surveillance and eradication activities;
- public opinion and social values, including issues related to animal welfare;
- economic factors (cost-benefit for loss of foreign markets versus cost of eradication);
- specific characteristics of the epizootic-related virus subtype;
- previous immune condition of herds in the area; and
- laboratory capacity to conduct internationally accepted tests.

The Planning Coordination should support the planning of the daily tactical-operational activities of field surveillance teams, ensuring the biosafety of the herds and between the different areas of animal health risk. At the end of each working day, the information should be evaluated, the epidemiological scenario redefined, with the establishment of surveillance priorities for the next day. At the beginning of each day, surveillance teams should receive guidance and herd ratio for inspection.

The Information Control and Evaluation Sector is responsible for consolidating, that is, for careful examination of data and information in search of incongruities, ensuring the typing and consistency of data and information produced by field teams, assisting the epidemiological analysis team.

The joint work of the Epidemiological Analysis and Reporting and the Veterinary Surveillance sectors should seek to identify the primary outbreak, the probable origin and mechanisms of introduction of the virus in the area of animal health emergency.

The Planning Coordination should maintain continuous assessment of the risk of FMD dispersion to support the urgent identification and screening of cases and their direct and indirect contacts. All activities of this Coordination should be recorded by the Epidemiological Analysis and Report Sector in order to ensure periodic preparation of updated bulletins on the operations implemented and on the epidemiological situation in the area of animal health emergency, including the preparation of maps, graphs, tables etc.

It is important to emphasize that the greater collaboration of producers and professionals involved in the outbreaks should be sought, avoiding their unnecessary exposure.

In the following items are highlighted and discussed some activities to be implemented by the COEZOO coordination team, with emphasis on the Coordination of Field Operations and Planning.

3.2. *Definition and management of the animal health emergency area*

The emergency area has legal, administrative and epidemiological expression.

From the legal point of view, it should be established by means of an official act of the MAPA, in which its extent is territorially delimited and actions to eradicate the disease are defined.

The administrative expression of the emergency area consists of the territorial extension over which the Operations Center exercises its jurisdiction.

Considering the options offered by the OIE, discussed in item 1.3, Part 1, from the legal and administrative point of view, one should choose to use one of the following strategies for emergency area **management:**

i) implementation of a **containment zone,** as a delimited geographical space that is now recognized by the OIE after the demonstration of absence of outbreaks for at least two incubation periods of the disease, counted from the last case; or

(ii) establishment of a **containment zone** composed of an **infected zone,** where outbreaks may be active, surrounded by a **zone where have not been outbreaks,** in which there must have been no record of the disease for at least two incubation periods of the disease.

From the epidemiological point of view, considering the characteristic of centrifugal dispersion of communicable diseases of acute course, with great diffusion power, such as FMD, the emergency area, considering a classical approach, can be subdivided into outbreaks and areas of epidemiological risk, according to Figure 05, classified as *perifocal, surveillance and protection,* being:

a) *perifocal area*: an area immediately surrounding the outbreak of FMD, comprising at least the rural properties adjacent to it. In support of its delimitation, a three-kilometer radius traced from the geographical limits of the confirmed outbreak can be used;

b) *surveillance area:* area immediately surrounding the perifocal area. As support to its delimitation, rural properties located up to seven kilometers from the boundaries of the perifocal area can be considered; and

c) protection area: area immediately surrounding the surveillance area, representing the limits of the sanitary protection area. As support to its delimitation, rural properties located up to fifteen kilometers from the limits of the surveillance area can be considered.

However, depending on the geographical and agroproductive characteristics of the area involved, as well as the dispersion of the disease, this division may not be adequate and other alternatives should be adopted.

The establishment of areas of differentiated epidemiological risk within the emergency area constitutes an operational component of importance, since it allows the execution of specific and differentiated control strategies according to the risk involved. The definition of these risk areas is based on a basic principle: the closer to an outbreak, the greater the risks of infection and contamination, and consequently, surveillance and eradication actions should be intensified, with the adoption of more restrictive control and surveillance activities.

The delimitation and management of the emergency area and its areas of epidemiological risk are the responsibility of the SVO, and should be defined by the COEZOO Coordination, based on the analyses carried out by the Planning Coordination, being constantly updated from the data collected by the Veterinary Surveillance and Traffic Control Sectors. In this definition should be considered: diagnosis of the epidemiological situation; geographical aspects, with emphasis on existing natural barriers; feasibility of facilities of checkpoints and inspection; administrative limits; road network; meteorological factors (winds, humidity → possibility of aerial transmission); animal movement flows; livestock production systems predominant in the region; animal demographics; susceptible species present; and economic and social interrelationships with other regions of the country and borders.

An optimistic but unrealistic picture is that the outbreak has been limited to a single rural establishment or contiguous rural establishments. The most likely, however, is that cases of the disease are identified in different rural establishments and in different locations in the emergency area, making the establishment of epidemiological risk areas a complex and very variable process. This was the case in the last outbreaks registered in the country: 2000 and 2001, in Rio Grande do Sul, and 2005/2006, in Mato Grosso do Sul and Paraná.

The strategy of establishing gradual risk areas around outbreaks of acute communicable diseases is well known and, in the case of Brazil, should be aligned with the SINEAGRO guidelines and updated based on the OIE recommendations, published mainly through the Terrestrial Code.

Regardless of the terminology used, it reinforces the importance of the geographical issue in the performance in outbreaks of FMD, highlighting the need for support from professionals who master knowledge in the area of geoprocessing and geographic information systems (GIS) and that there is availability in COEZOO of equipment, software, data and digital images to perform the work, combined with the availability of georeferenced registration updated by the SVS. The technology and tools currently available on GIS are very vast and essential in conducting an emergency action. Trained professionals, a good microcomputer connected to the Internet, suitable software, and a quality printer, represent the minimum structure required. The team must have appropriate digital data, such as road network, natural elements (forests, rivers, reliefs) among others (both in the form of vectors and matrix) that can support the activities of surveillance and implementation of fixed posts. In addition to the digital apparatus, maps printed on scales of greater detail, such as 1:50,000, 1:30,000 or 1:25,000 are of great use for analyzing strategies during meetings of the command teams, and for this, it is important the availability of tables, tables, multimedia projector, murals or panels for handling and display of said maps printed or digitized.

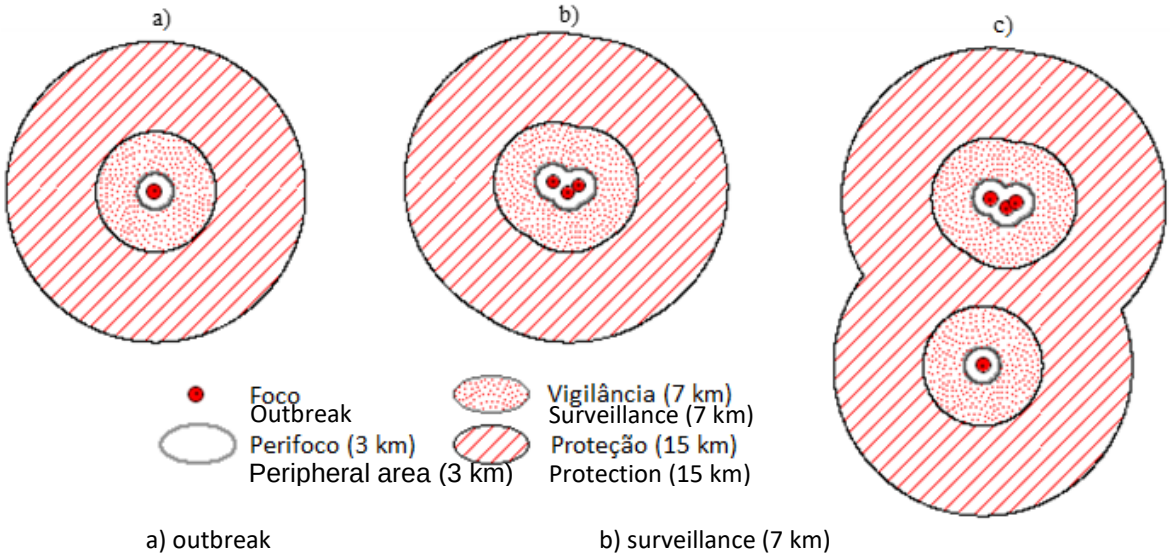
It should be made clear that the radius and their limits proposed in the technical standards are theoretical and operational support elements. The risk areas are initially established based on limits represented by imaginary lines, which must be shaped to the geographical and agroproductive realities of the region, considering, in addition to the scenario of disease dispersion, the presence of natural barriers such as forests, rivers, agricultural plantation areas, as well as the feasibility of installing fixed checkpoints. It is therefore a guideline that can and should be appropriate for each ongoing epidemiological context. The dimensions and boundaries of the areas must be adequate to the geographical realities found, and for each defined area specific surveillance activities are established for execution by different technical teams.

A schematic representation of the use of geographic rays in support of the definition of epidemiological risk areas is presented in Figure 05. However, these imaginary and schematic lines, after the evaluations and adjustments mentioned, lose the initial circumference format, shaping the geographical and agroproductive reality found. For example, in Figures 06 to 16, different map and geographical representations of the areas of emergency and epidemiological risk established in the last occurrences of FMD in the country are presented.

Once the epidemiological risk areas around the outbreaks have been defined, procedures for restricting, controlling, and supervising the transit of animals and risk products should be implemented, including the installation of transit control posts. It is recommended to signal at the access points to the emergency area, to warn about the occurrence of animal health risk.

Initially, all movement of animals and products at risk for FMD should be discontinued throughout the emergency area. As the actions are implemented and the epidemiological picture becomes clearer, gradual suspensions of the interdiction can be implemented, according to the areas of epidemiological risk established, and it is up to the COEZOO Coordination to define the criteria and procedures and control the issuance of specific documents to control the authorized movements in the interdiction area, which

should be appropriate to the specific realities and needs identified during animal health emergency actions.



a) outbreak b) surveillance (7 km)

Figure 05. Schematic representation of the definition of risk areas around outbreaks of FMD considering the presence of an outbreak (a), near outbreaks (b) and near and distant outbreaks (c).

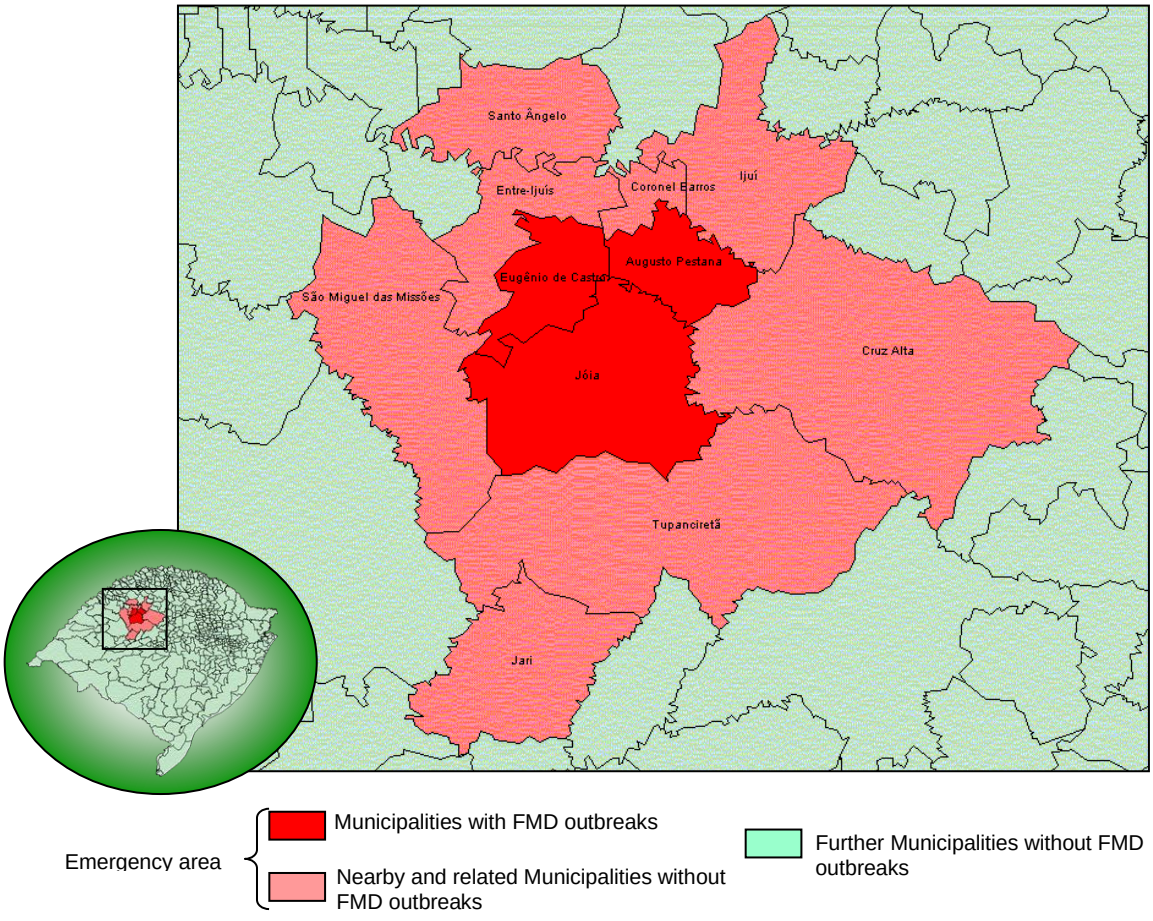


Figure 06. Prohibited area defined at the beginning of health emergency actions, RS, 2000

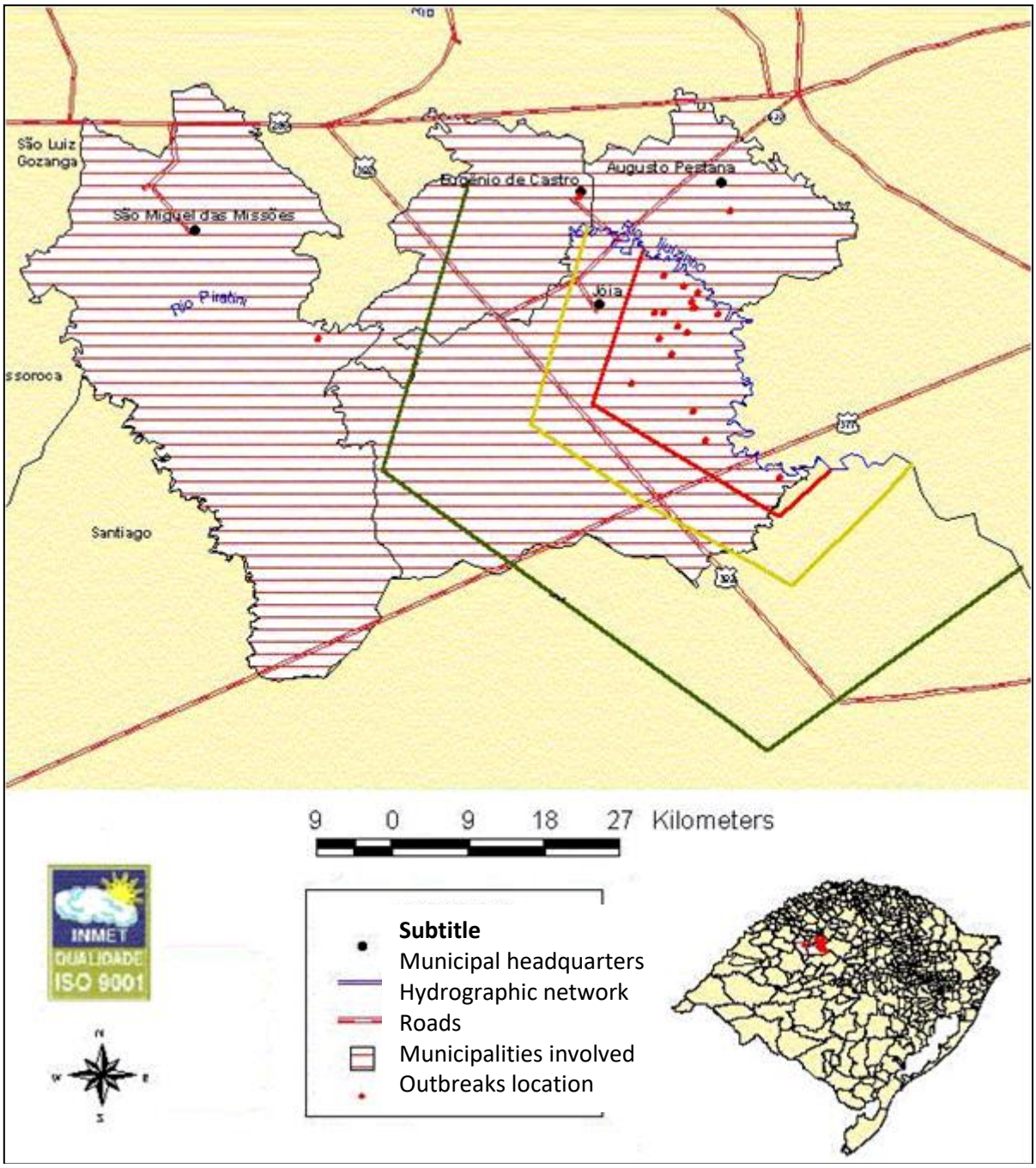


Figure 07. Geographical representation of epidemiological risk areas established around the outbreaks located in the municipality of Jóia, RS, 2000

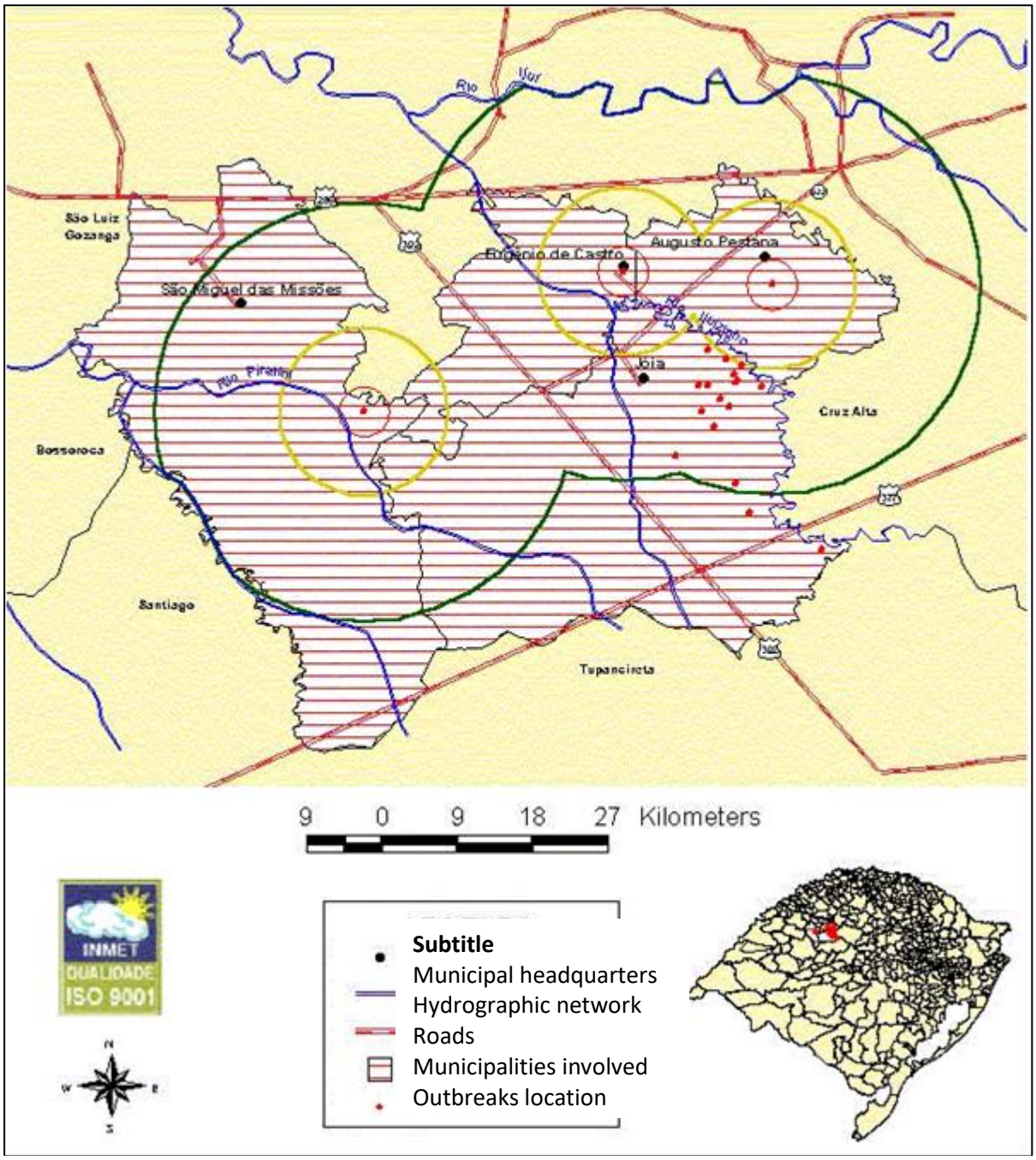


Figure 08. Geographical representation of epidemiological risk areas established around the outbreaks located in the municipalities of Augusto Pestana, Eugênio de Castro and São Miguel das Missões, RS, 2000

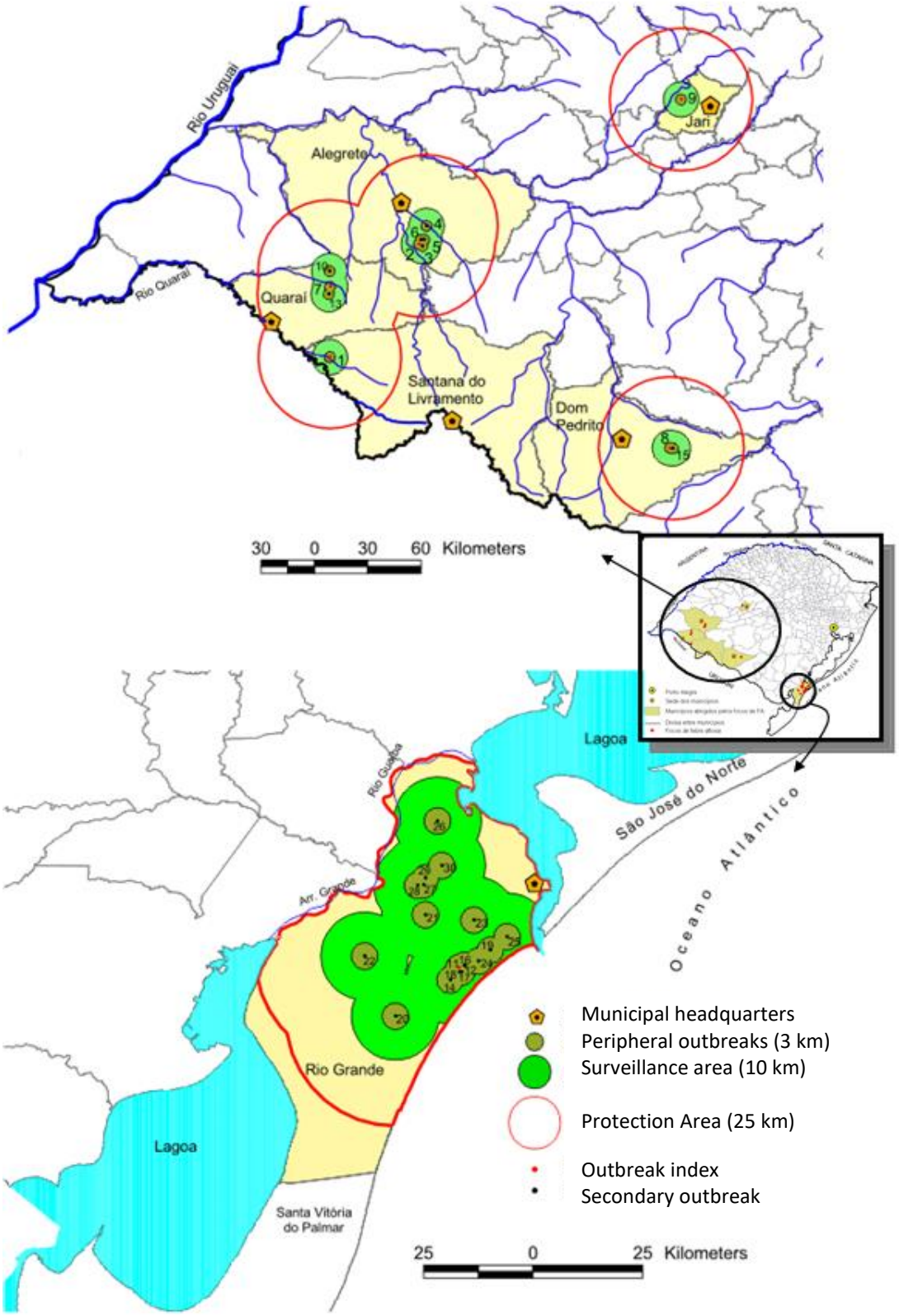


Figure 09. Geographical location two focal markets, with highlights, RS, 2001

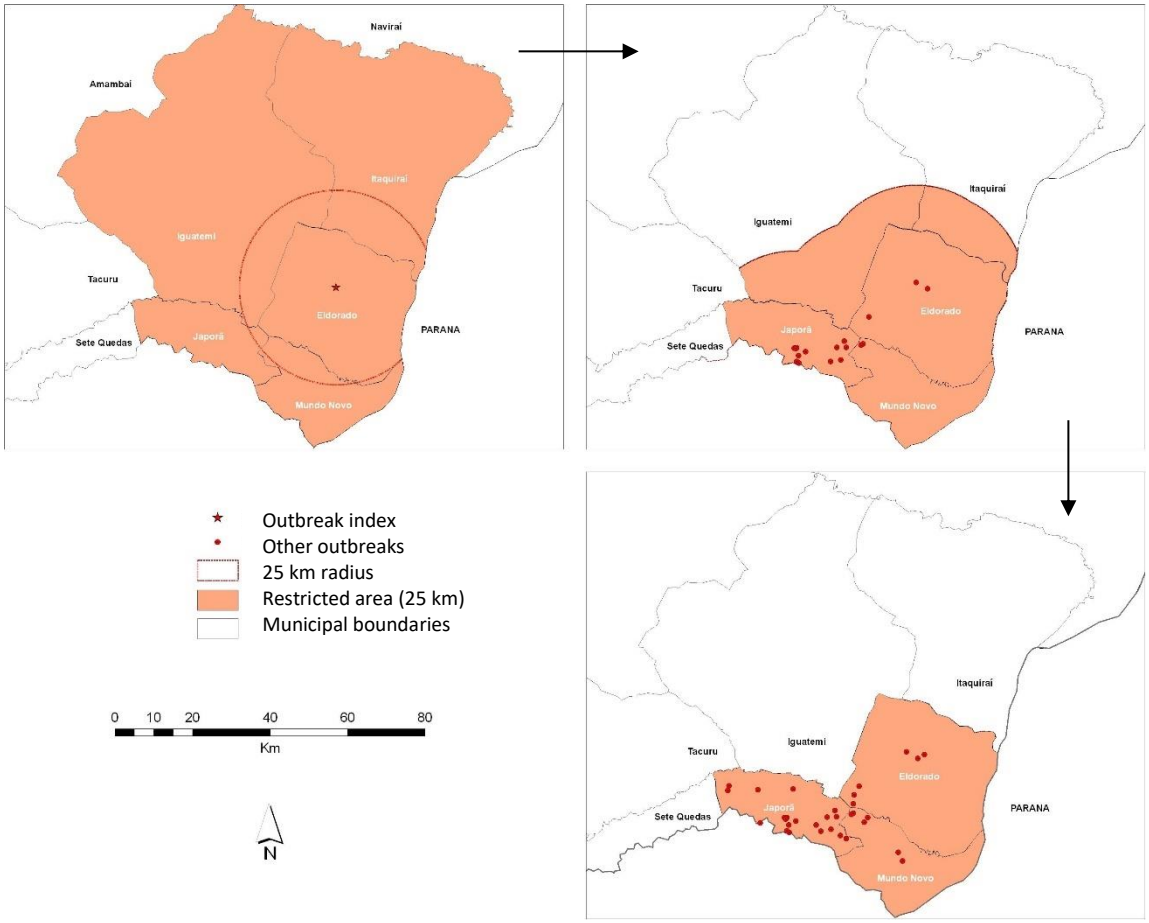


Figure 10. Sequence of areas under interdiction in the State of Mato Grosso do Sul aiming at the containment of outbreaks of FMD registered in 2005 and 2006

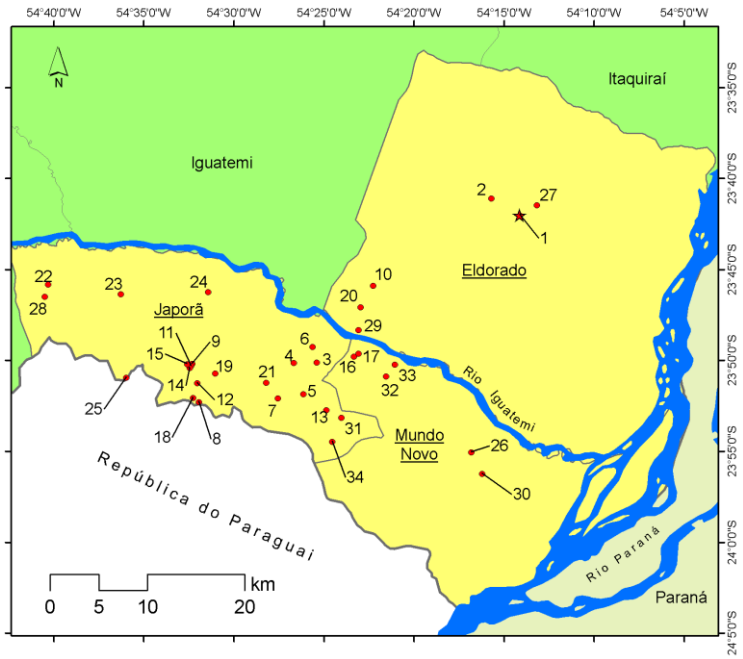


Figure 11. Location of the outbreaks registered in Mato Grosso do Sul, 2005 and 2006
(the id number corresponds to the detection sequence)

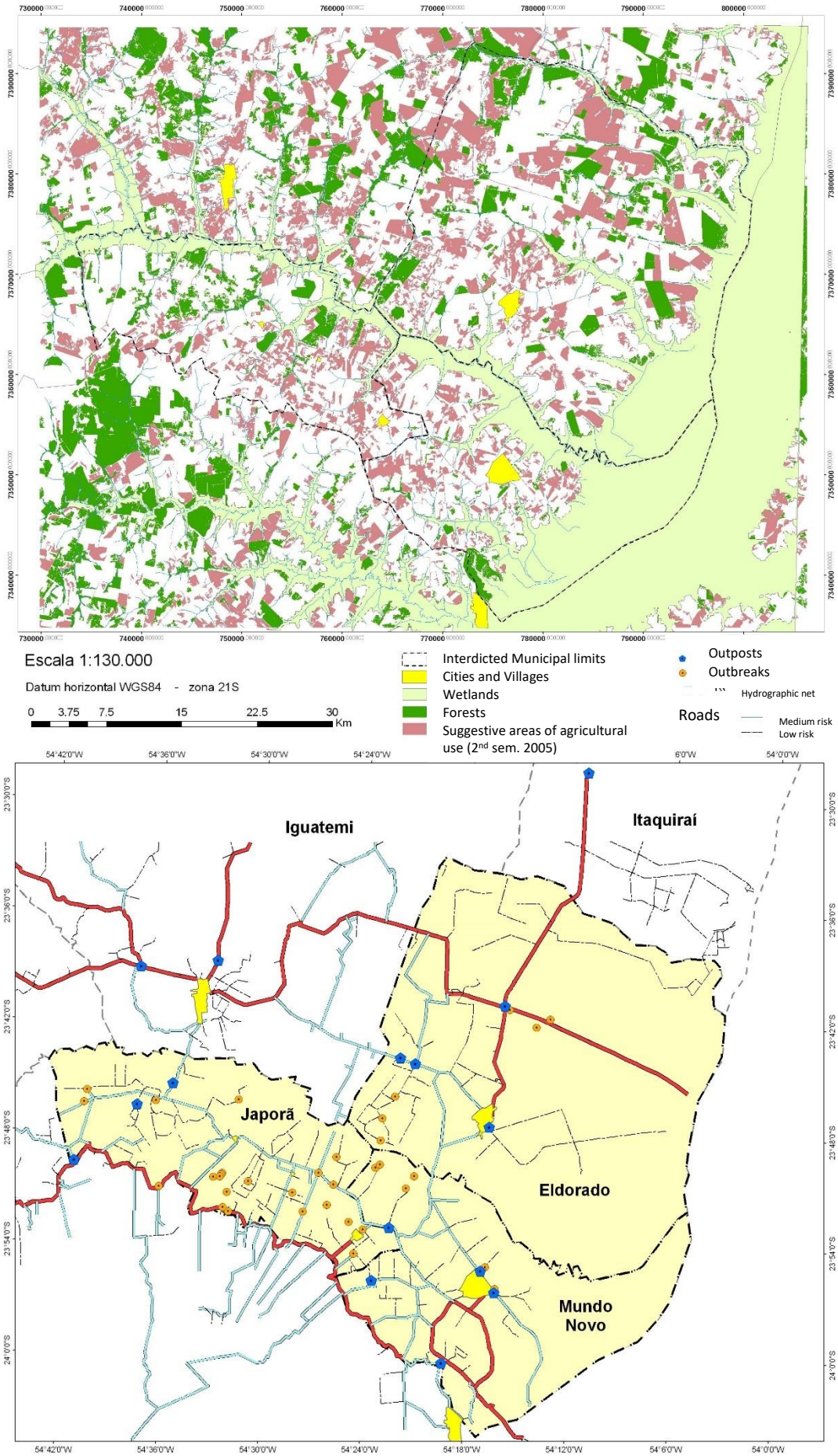


Figure 12. Example of MAPA of the restricted area, drawn from satellite images SPOT-5 and SRTM, MS, 2005

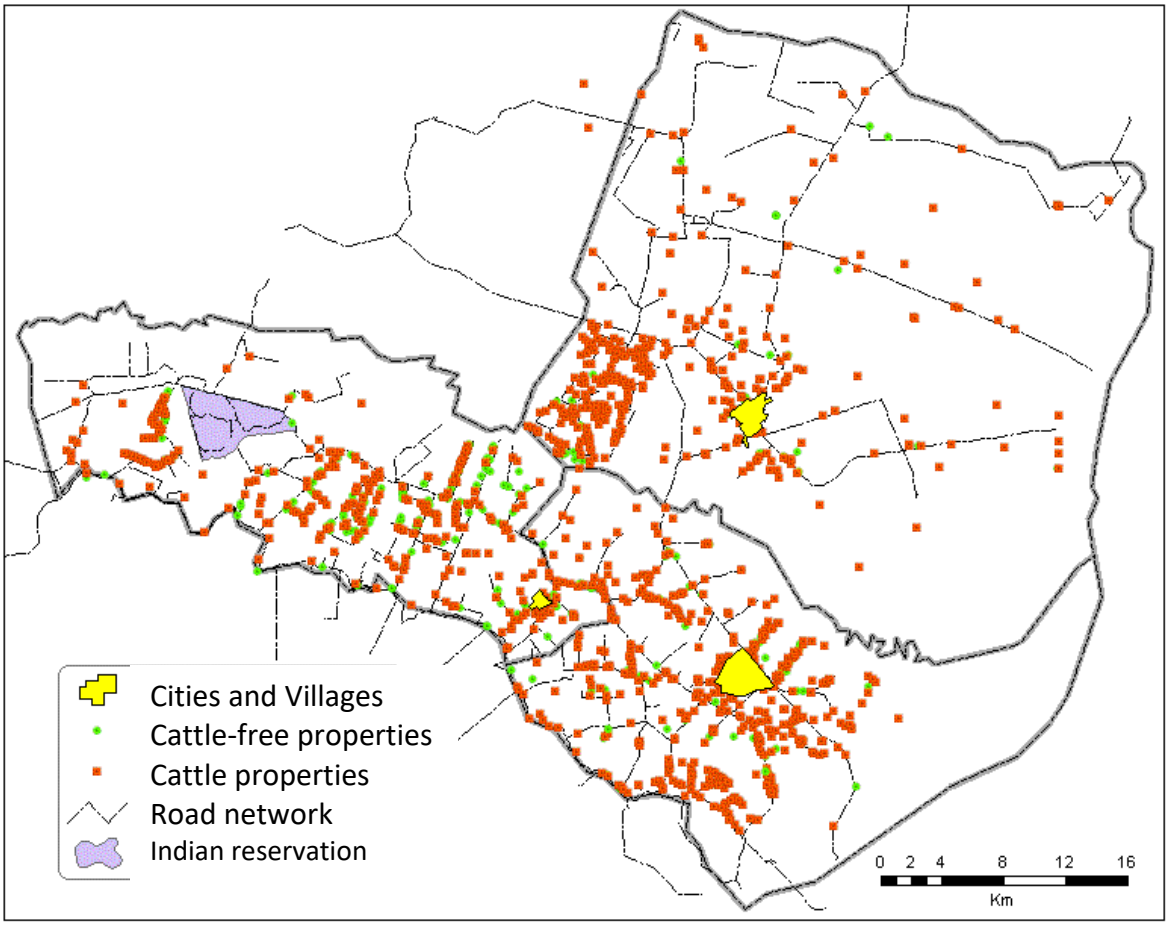


Figure 13. Geographical distribution of rural properties with and without cattle located in the interdicted municipalities, MS, 2005 (points acquired at the headquarters of rural properties)

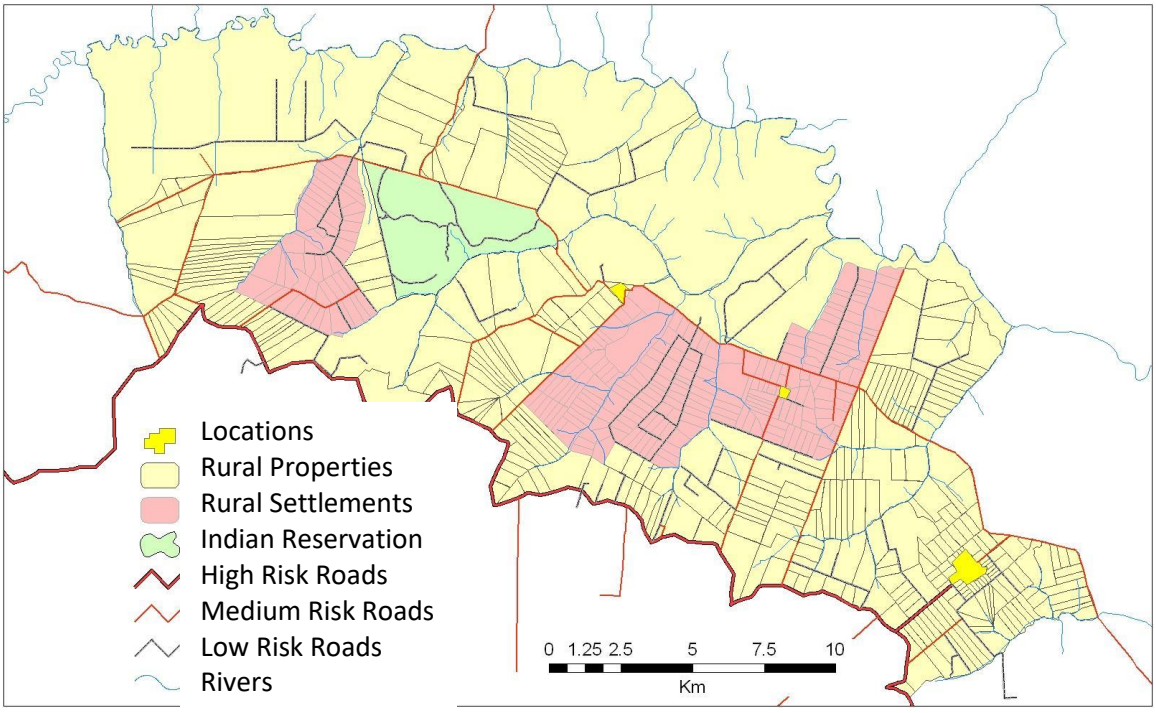


Figure 14. Distribution of rural properties, with emphasis on rural settlement projects, Municipality of Japorã, MS, 2005.

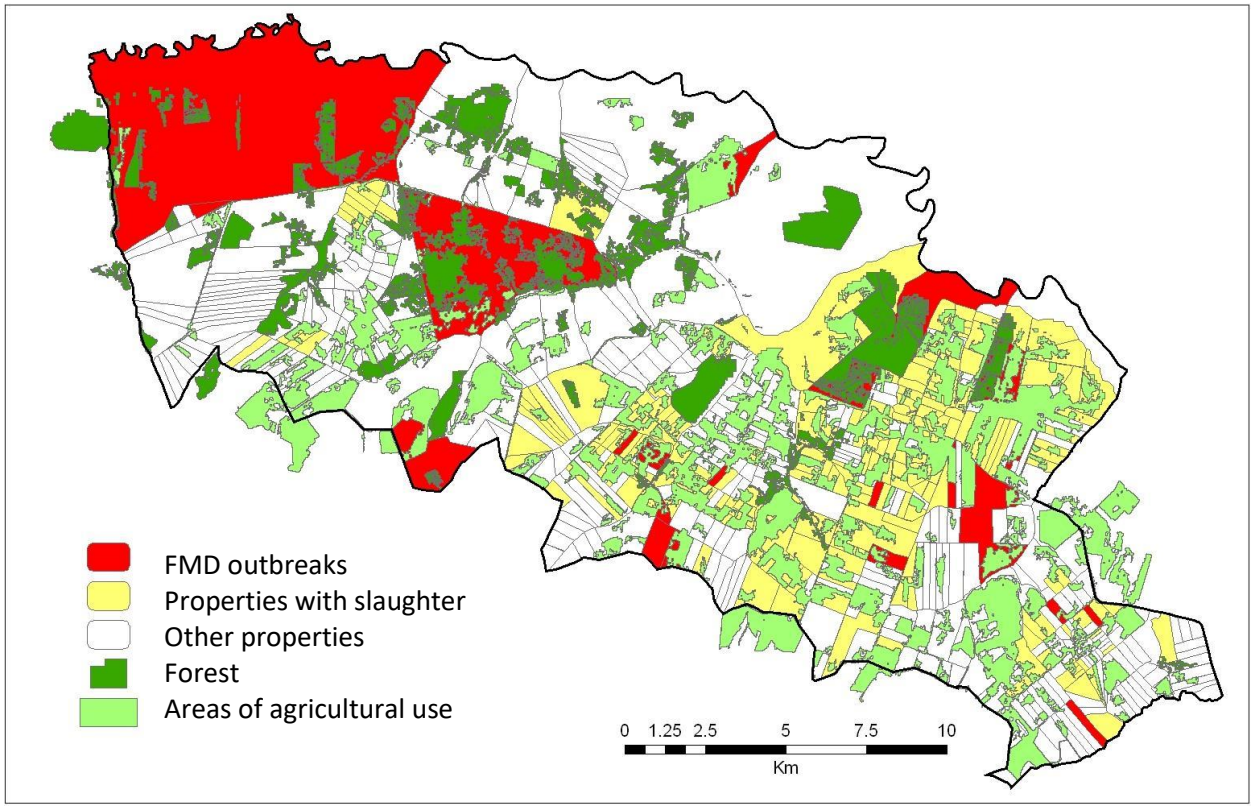


Figure 15. Municipality of Japorã, MS, 2005

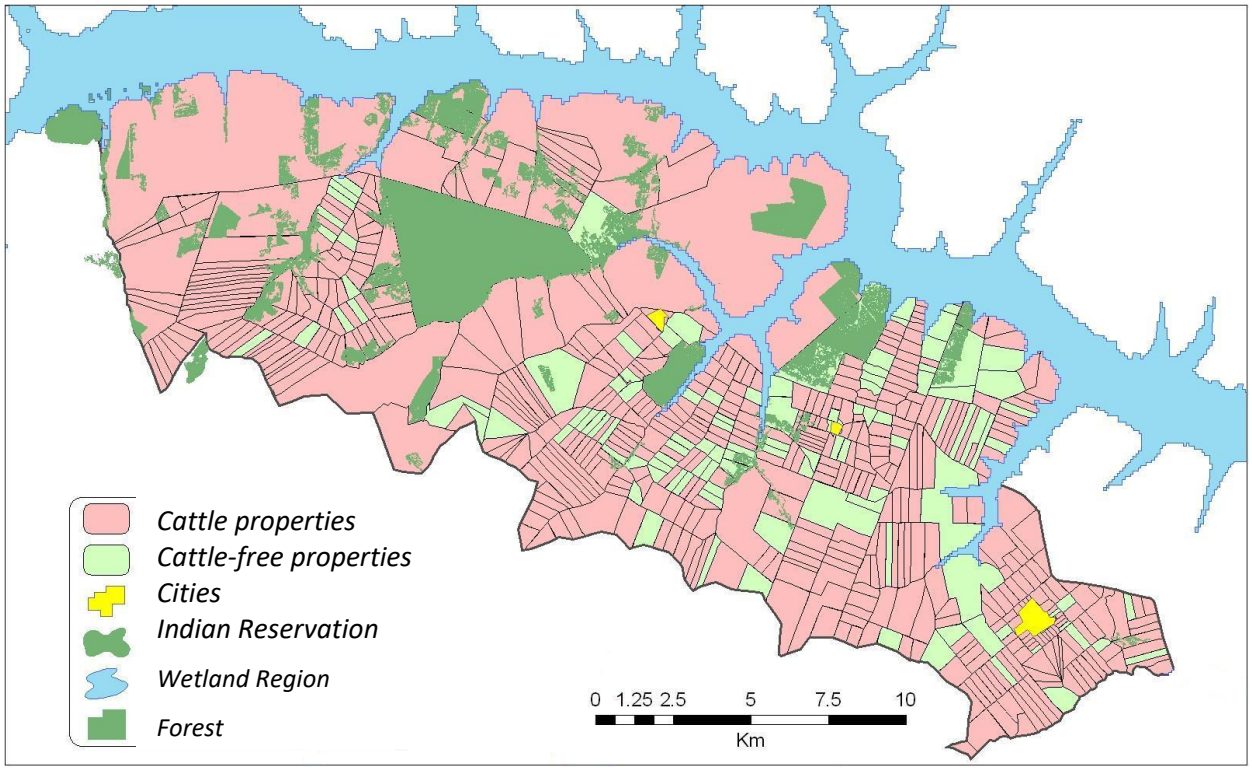


Figure 16. Updated map of Japorã, with identification of properties with and without cattle, 2005

The movement of animals and products of risk may be prohibited, permitted with restrictions or authorized, depending on the nature/characteristic of the animal or product, risk assessment, effectiveness of the treatments or procedures employed to reduce or eliminate the risk, destination, considerations on animal welfare and on the health status of the places of origin and destination. Controls must meet at least the requirements of the OIE Terrestrial Code and may be more restrictive in certain areas at the initial stage and relaxed in others, depending on risk assessment and analysis of emergency developments.

Common examples in the management of FMD occurrences in the country refer to milk collection and problems of pasture and feeding scarcity, which require decision-making by the COEZOO Coordination. The issue of milk collection is discussed in the **Vesicular Disease Investigation Manual,** involving solutions such as interruption of milk collection, with guidelines for the disposal or destruction of the product in rural establishments (in the latter case, compensation should be provided to producers), or replanning the collector truck route, when possible. The problem of pasture scarcity occurs mainly during the interdiction measures, from the first and second months of interdiction. The coordination of COEZOO should seek solutions within the animal health emergency area, evaluating the need for food acquisition and distribution. When it is possible to transfer the animals, it should be accompanied by the SVO and be limited to the animal health emergency area, being the transport carried out by cattle trucks, preferably within areas with the same epidemiological risk or, if this is not possible, be carried out in the direction of the areas of least risk for those at higher risk.

In addition to the proximity to the outbreaks, another factor that should also be considered regarding the level and strictness of the restrictions to be implemented, concerns the work phase that the activities are in outbreak. Thus, if the presence of sick animals and their direct contacts persists, restrictions should be stricter.

The need for surveillance and early detection of cases should be assessed in the face of the risk of introduction of the virus by field teams. Thus, biosafety measures should be rigorous to prevent the spread of the viral agent. More detailed instructions on biosecurity measures to be adopted in property surveillance are set out in Attachment I to this Plan.

The performance in outbreaks and in the different areas of epidemiological risk should be carried out by different teams. Professionals working in the outbreaks, especially in the phase with the presence of sick animals, should remain at least 24 hours without visiting another property with susceptible animals. Teams working in the infected area must wait one day and take all biosecurity care before participating in surveillance activities. In the transfer of teams from a lower risk area to a higher risk area, there is no need to perform the mentioned procedures.

The distribution of teams within the respective epidemiological risk areas should be sectorized, according to the number of teams available. Each team must be composed of at least one veterinarian and one field assistant. The geographical area assigned to each team should consider characteristics of livestock production, size of farms and herds, types of predominant exploitation, geography and topography of the area, means of displacement used, distances, human resources and materials available and classification of the risk area, remembering that the frequency of inspections will be higher in areas of higher epidemiological risk.

Among the studies to be carried out, we highlight the need for inspection and the registry updating of all properties located in the animal health emergency area. This work should be carried out considering the epidemiological subdivisions, with distinct teams for each one of them. In all properties investigated, guidance and clarification should be made on signs of the disease, mandatory immediate notification of suspicions, prevention and biosafety measures to be established, restrictions imposed, and actions related to the emergency implemented in the area.

Below, there are the main activities for management in areas of epidemiological risk, remembering that the higher the risk, the greater the restrictions and the more intensified surveillance activities:

- installation of warning signs on the perimeter of the animal health emergency area;
- installation of 24-hour control stations in strategic points and access to the animal health emergency area and between areas of epidemiological risk;
- all rural establishments with susceptible animals in the animal health emergency area should be periodically inspected by the SVO, with clinical inspection on susceptible animals, in order to quickly detect the appearance of clinical signs of FMD, as well as survey and update of register. The periodicity of inspection should occur at shorter time intervals in areas of higher epidemiological risk. The workforce should be adequate to the need for inspection of rural establishments, starting with a lower frequency, especially in the infected area, which can be expanded as the animal health occurrence becomes controlled and the outbreaks eliminated;
- increase in levels of biosafety in properties, and cleaning and disinfection of vehicles, people and equipment entering and leaving them (animal health education activities);
- installation of disinfection barriers in the exit accesses of the infected properties and at the control points of movement;
- prohibition of animal agglomeration events;
- restrictions on the movement of susceptible animals and agricultural products;
- definition of the destination of risky livestock products (milk, meat, among others);
- preventive slaughter of clinically healthy animals, to reduce the susceptible population in the area, if there are slaughterhouses in or near the animal health emergency area; and
- release for slaughter of animals for internal consumption (in slaughterhouses located in or near the emergency area itself), after clinical inspection of all susceptible animals, epidemiological evaluation and use of biosafety measures (slaughter, when authorized, must be accompanied by the official service and boning with bone incineration).

2.1. Control and management of information

The performance in animal health emergency involves an intense flow of data and information, in different formats and quality, and requires rapid compilation and analysis, in view of the need to support decision-making and to render transparency to all ongoing actions. Especially in the first few weeks, the pressure for information is very intense, both at the local and national levels, as well as at the international level. Therefore, the Planning Coordination is of strategic importance, with its attributions and workflow summarized in Figure 17. The number of professionals to work in the sectors involved will depend mainly on the availability of a computerized system for information control and management, as well as on the quality and format of the available data.

Given the different demands presented and recognizing the immediate need for data and information, the availability of information system for emergency action management is essential. As part of the preparations for action in animal health emergencies, those responsible for the management of the PNCEA should develop efforts to provide computerized solutions for use by COEZOO coordination teams, and, at the state level, evaluate and encourage the modernization of registration and movement information systems by local veterinary services, including the constant updating of data and georeferencing of agricultural establishments.

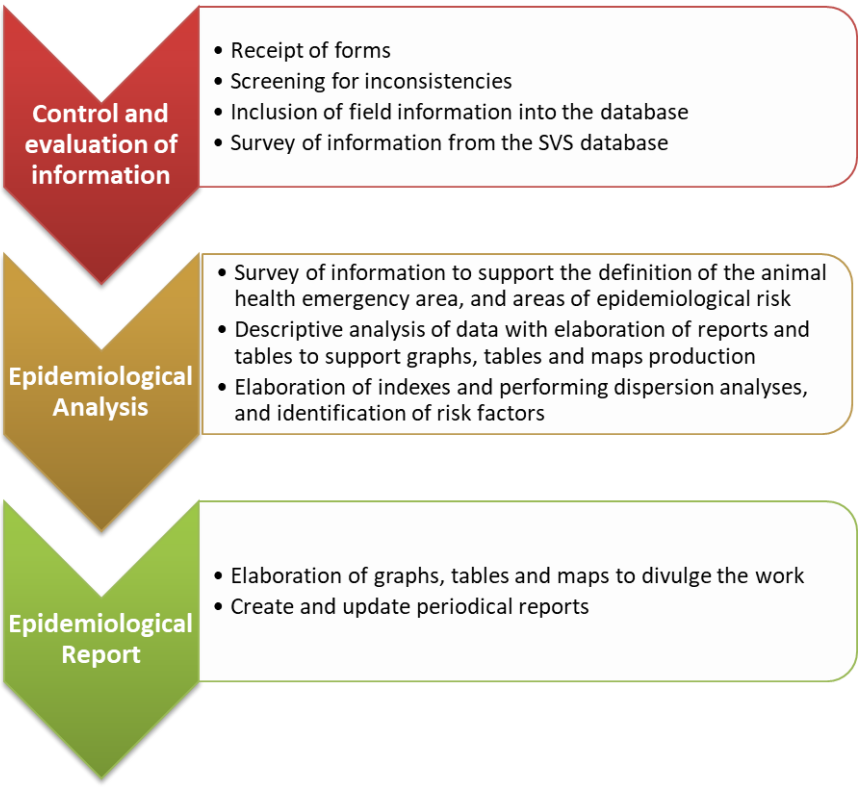


Figure 17. Basic steps and flows of information in the Planning Coordination

In general, the greater the degree of organization and detail of the data and information of the record base of the SVS, the greater the agility and accuracy of the actions to be taken to control and eradicate the animal health occurrence. According to the available format, the epidemiological information sector should adapt the methodology of collection and analysis of the information necessary for the management of animal health emergency activities. In general, the following situations may occur: computerized base with geographic coordinate data (ideal situation); computerized base without geographic coordinates data; computerized basis with geographic coordinates information; or non-computerized base without geographic coordinates information (worst case scenario). Of course, the implementation and management of an animal health emergency is optimized and facilitated with the availability of a state computerized system containing data on animal movement and georeferenced rural register, enabling greater agility in the definition of risk areas and surveillance activities. On the other hand, the availability of data and information only in printing, will make it difficult to define the initial strategies and will require a larger structure for typing and creation of the database of the animal health emergency area.

A schematic representation of the structure and data flow in an animal health emergency is available in Figure 18. As an initial entry of data, we highlight the importance of information from the databases of the SVS or the Agricultural Management Platform (PGA). Once COEZOO is implemented, the main sources of data and information for the system are represented by the activities of the surveillance teams, the notifications of suspected cases reported by the community and the actions developed by the teams to monitor the traffic of animals and risk products (fixed stations and mobile teams) and by the emergency vaccination teams (when this strategy is adopted), among other sources. The information control and evaluation sector collect, validates and analyzes data and information, producing outputs and results as summarized in Figure 17. All the information produced is shared with the COEZOO sectors, serving as a basis for those activities developed by the communication and public relations office, as well as for the preparation of reports analysis and reports for submission to the higher levels of coordination, especially the DSA.

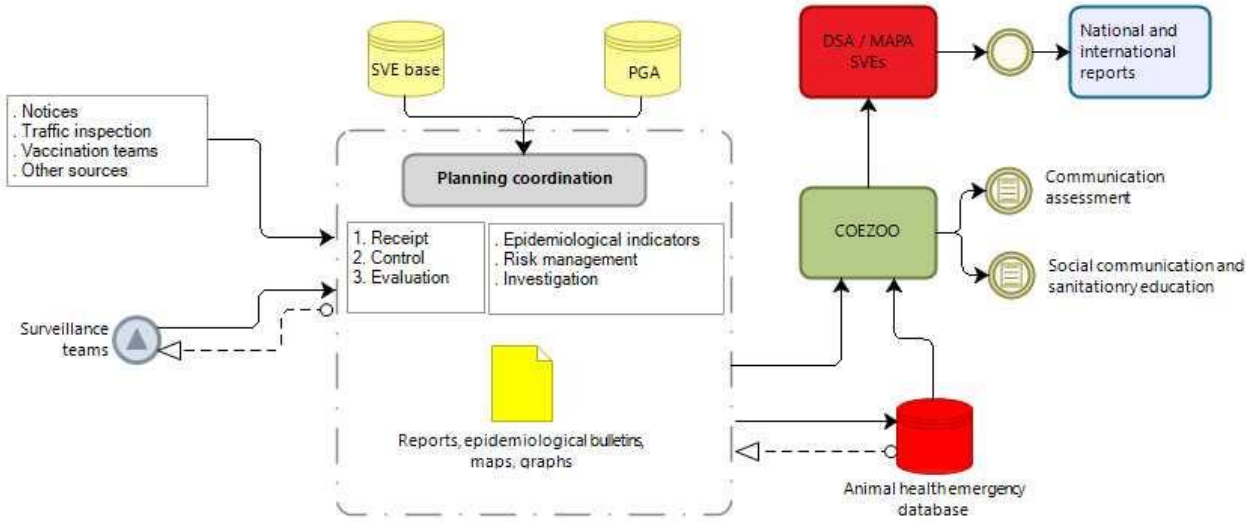


Figure 18. Representation of the main flows and bases of the information system in an animal health emergency

As mentioned in the previous item, one of the first tasks of the Planning Coordination is to support the General Coordination of COEZOO in the delimitation of the animal health emergency area and in the establishment of epidemiological risk areas. After this stage is done, which occurs daily, as the information is updated, new epidemiological analyses are carried out making it possible to estimate indicators and produce maps that allow describing the epidemiological profile of the ongoing animal health event, guiding the direction of veterinary surveillance actions.

The Planning Coordination should maintain continuous assessment of the risk of FMD dispersion to support the urgent identification and screening of cases and their direct and indirect contacts. All activities of this Coordination should be recorded and summarized by the Analysis and Epidemiological Report Sector in order to update the communication of the operations carried out and the epidemiological situation in the area of animal health emergency, including the preparation of maps, graphs, tables, etc. The table below shows the main types and periodicity of the reports that should be generated. The preparation of these reports bears the main objectives of strengthening the community's confidence in emergency actions; proactively and voluntarily informing, with transparency; transmitting, as soon as possible, even incomplete information to control rumors and establish itself as a reference; answering questions that demonstrate sensitivity to the target audience; and prioritizing communications for more urgent demands during the animal health emergency.

Table 2. Main types of reports for preparation during animal health emergency actions

REPORT TYPE	NATURE OF INFORMATION	PERIODICITY	VEHICULATION
*Follow-up report	OIE Report (WAHIS)	Weekly	COEZOO, MAPA, OIE
Bulletin	Information	Daily	COEZOO, SVS, MAPA
Surveillance itinerary	Operational	Daily	COEZOO, Veterinary Surveillance
Technical note	Descriptive	Weekly	COEZOO, SVS, MAPA
Public notice	Press divulgation	Weekly	Press Assessment/COEZOO

***** Report produced by the Coordination of Information and Epidemiology (CIEP) of CGPZ/DSA based on information produced by COEZOO

2.2. Education and social communication activities

The success of animal health emergency actions cannot lack the support of the population. Thus, it is imperative that the community is committed, act as co-responsible and participate of the work developed, with the support of the private sector and under the coordination of the public sphere.

Involving the community as quickly as possible is a key element for the implementation of animal health emergency. This will not only help to gain local trust and support, it will provide important information about the region's concerns and prospects. It cannot be disregarded that the community is, par excellence, aware of the local reality, of facts that may have caused the beginning of the animal health event and the risk elements involved in its dissemination. Considering the importance of the quick involvement and clarification of the local community, the education and social communication team should compose the group of professionals who initiate the activities of animal health emergency.

Of course, there is no single and universal model of action because an effective communication process must, in addition to informing, produce in the target audience a proactive attitude to face the problem. Thus, the information conveyed must be understandable, easy to assimilate and memorize, shaped according to the level of education and cultural environment, predominantly rural. The excess of information can be an obstacle, confusing the local community, especially the rural farmer.

Education and social communication activities in the emergency area should consider the following points:

- the technical sectors responsible for PNEFA in the states and in the DSA must produce in advance and dispose, for prompt use, of specific educational material, with simple and didactic language, to be used during animal health occurrences. Preferably, the material must be timeless and without logos of governments and political parties. Posters are resources for places where there is a large movement of people (they can be seen in the streets, hospitals, bus stops, neighborhood associations, religious temples, etc.). Synthesized posters with good visual balance allow the message to be picked up quickly. The brochure is an easier way to reach the public and can be delivered directly to stakeholders. It can be the ideal complement to a lecture and its writing should have an informative-persuasive style and a clear educational approach. It is recommended to carefully choose the words so that there are no ambiguous meanings or double meaning;
- availability of audiovisual materials is also especially useful. Regional television activity has an efficient development in journalistic local spaces, regional and international news, which arouses community interest. In this context, you can enter the risk communication messages. The materials directed to the television public should be prepared with extreme care and always considering mass communication, transmission times and whether they will be broadcast on open or closed channels. The video is another interesting way to disseminate information to specific audiences. The usefulness of this educational modality is important because it allows visual expression and has the necessary sound support for all kinds of educational dissemination that complements the presence of technical personnel. The display of a video can enrich other communicative actions such as dialogue with a specific audience, debates, delivery of information leaflets, repetition of scenes that must be fixed etc.;
- the media team is the main link between COEZOO and the community. Thus, you must be informed of all decisions, directions, technical notes and emergency procedures that are issued during the occurrence of the health event; keeping in daily contact with the most diverse segments of society, maintaining them updated and involved;

- the structure of COEZOO has a provision for a communication and public relations office for daily contact with the mass media, activity that should be attributed to the press and public relations team. An animal health emergency represents an event of great interest to the national media and even the international media. This interest has several implications for the control of the sanitary event. In a positive way, the media can be used very effectively, especially at the beginning of the health event, to inform the public, provided that the materials translate technical information into common language. Conversely, sensationalist reports can bring public anxiety to levels disproportionate to the reality of the situation;

- planning is critical to the success of an education and social communication program during an animal health emergency. The success or failure of communication activities can depend largely on the definition of clear goals, which will vary according to the action strategy defined by the Coordination team. Even working in an animal health emergency situation, when there is no time to develop a complete education and media plan, sometimes should be devoted to drawing up an outline of the strategy of action. The basic communication plan, during an animal health emergency, should be based on knowledge about the epidemiology of the disease; be focused on the technical issues and guidelines of the Contingency Plan; and be flexible, taking into account the evolution of the animal health situation and the advancement of animal health emergency activities. Professionals involved in education and media activities should consider and record all points of interest to be prepared if they need to consult data or redefine strategies;

- to develop a Risk Communication Plan, it is necessary to consider the following key elements:
  - Source: the success of the messages disclosed during an animal health emergency has been shown to be strongly associated with the trustor credibility that the recipient of the message attributes to the risk communicator. It is necessary to understand that trust is an important factor for the acceptance and effectiveness of messages during an animal health event;
  - Message: despite the complexity of information related to an animal health emergency, most information about the procedures used can be easily understood, if transmitted in a simple way and in terms accessible to any citizen, so that the citizens can understand what the risk means and how they can participate; and
  - Media: media communication an important role in risk communication, as they represent the mechanism by which the message reaches the general public. It is therefore essential to decide objectively the type of means or means of communication that will participate in a risk communication plan. Radio is the closest method of diffusion to people, especially in the rural area. It represents synthesis, conciseness, immediacy, concurrency, and speed. Through it one can reach a heterogeneous audience, with different levels of understanding, and for this reason it is necessary to ensure that radio messages can reach everyone. Speaking on the radio means explaining, counting, and dialoguing with the receiver, being able to transmit messages through interviews, reports, and special reports. Today, even in rural areas, one should not disregard the importance and power of TV, the Internet, and social media. Thus, establishing forms of communication through TV, web and social media should represent an important point in the communication plan;

- interrelation with other institutional organizations and groups is essential, as well as to build bridges with agencies and organizations that support those activities. Especially at the local level, contacts with intermediaries and leaders who have a long-term relationship with the community are important, being recognized as a local reference. Thus, all elements that have influence over communities, whether political or religious, should be contacted, sensitized, and called to assume the responsibilities of the function they occupy. Potential target groups include:

- ✓ local staff and assigned servants (municipal servants of the secretariats, Mayor, administrator or the person in charge and authorities of the animal health council, local committees and planning council);
- ✓ representatives of organized citizen groups; representatives of religious organizations;
- ✓ professionals in the production chain (veterinarians, agronomists, zootechnicians, agricultural technicians, among others);
- ✓ associations and cooperatives operating in the region;
- ✓ educational entities and their educators;
- ✓ local, regional and state media;
- ✓ other government institutions; and
- ✓ members of professional organizations.

- important factors such as the number of people who will develop social communication activities is fundamental to define the strategy of action and distribution of teams according to areas of epidemiological risk, where meetings, lectures and gatherings take place simultaneously with other actions to control and eradicate outbreaks;

- in local communication actions, avoid excessively technical language, seeking to be sensitive to local habits, as a way of speaking and dressing. Use concrete and well-known images that allow communication on a personal level. Using examples to make technical data more vivid and accessible, jargon and technical language create barriers to successful communication with the public;

- education and social communication activities should be systematically evaluated during animal health emergency, as there is a need to know if the objective has been achieved, if messages are being communicated effectively or if there has been a change in behavior. In education entities, an interesting contact can be made to evaluate the perception of the community through the elaboration of essays, drawings, among other forms of expression, a remarkably interesting and proven effective working methodology.

2.3. Elimination of outbreaks

This is a critical point of all eradication work. It involves a set of complementary and sequential activities that, therefore, should be carried out in a scheduled and independent manner in each identified outbreak: evaluation; euthanasia of animals; destruction of carcasses, objects and buildings; cleaning and disinfection of facilities and equipment; sanitary emptying; introduction of sentinel animals and restocking. Epidemiological investigation activities should also be included, considering clinical and serological evaluation, for better knowledge about viral agent dispersion, providing parameters for future intervention and investigation of viral infection/transmission. A schematic representation of the flow of activities considered in the elimination of outbreaks is available in Figure 19, highlighting that the introduction of sentinels is not a mandatory activity, and its use should be defined by the General Coordination of COEZOO.

Figure 19. Flow of the main activities for elimination of FMD outbreaks

The teams responsible for these activities must carefully follow the biosafety recommendations (Attachment 01) and comply with rest intervals for contact with other herds of susceptible animals free of the disease.

Depending on the region involved, it should be evaluated the need to create a vector control and control group of street animals or wildlife, within the activities of mitigating the risks of spreading the disease, from the identified outbreaks.

Special attention should be given to compensation and indemnification procedures, since they involve resources from the Federal or State Governments or the private sector, the use of which must be duly proven. As highlighted, the availability of resources for compensation and the procedures for its performance are important elements for defining the intervention strategy to be adopted in animal health emergency. There are several elements to be considered and different normative acts, from the Federal and State Governments, that should be considered. Some possibilities, based on the legislation in force and considering agreements and partnerships between the Federal and State governments, are summarized in the flow presented in Figure 20, highlighting, however, that the scheme presented does not prevent the possibility of indemnifications occurring exclusively by funds (private or public) when available and with sufficient resources to absorb the costs.

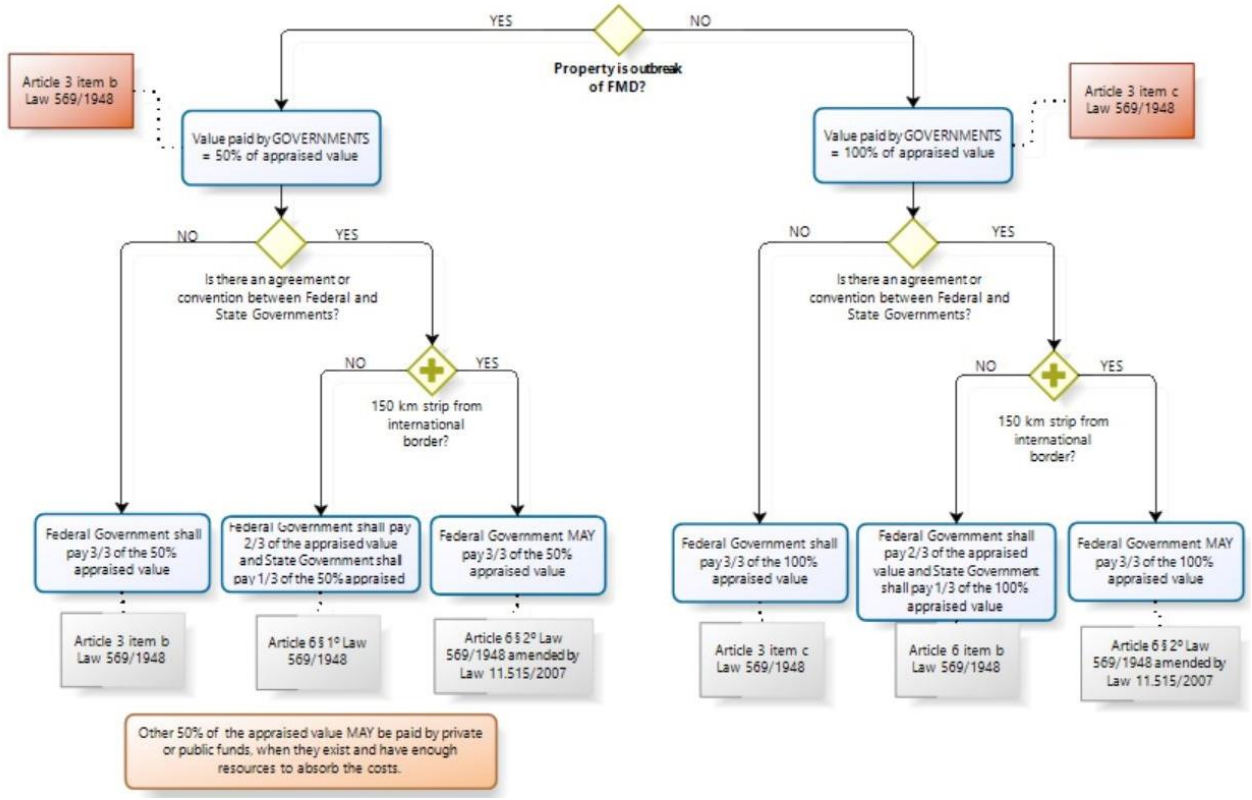


Figure 20. Schematic abstract on alternatives provided for in normative acts for compensation in occurrences of FMD

All procedures must be properly recorded and documented. In each unit of the Federation there must be established the procedural rite, with description of all the necessary steps and documentation, based on Federal or State legislation, depending on the origin of the resources used. The document templates used at each stage of the activity should be available to the teams responsible for execution (some templates are suggested in Attachments 8 to 11. Thus, documents proving the diagnosis of the disease and the declaration of the state of emergency should be added to the sacrificial/destruction and evaluation records to set up the individual indemnification processes.

If the indemnity involves federal resources, some items shall be highlighted and documents that should be considered in the opening of proceedings for each owner, based on the experience recorded in the outbreaks of Mato Grosso do Sul, 2005/2006:

- the filing of the proceedings must take place on the basis of the owner's statement, agreeing with the content of the corresponding evaluation and slaughter documents and requesting the SFA of the respective UF to instruct the indemnification process to which it is entitled, filed within a maximum of 180 days after the issuance of said record of slaughter, according to Article 7 of Law 11.515/2007;
- the following should be attached to the process: evaluation and slaughter records; technical note prepared by the DSA informing about eradication activities and the need for sacrificial and destruction procedures; laboratory test result (when available), inspection term, FORM-IN, FORM-COM, photographs, among other documents characterizing the condition of confirmed case of FMD;
- when the indemnity considers a significant number of owners, a common fact in agricultural productive systems with a predominance of small producers and rural settlements, the General Coordination of COEZOO should provide for the inclusion of a specific sector for community service, with the aim of receiving and analyzing documentation, filing of processes and legal support;
- to be considered valid, effective, and complete, the process of indemnification of the producer must follow all the steps provided by law. A representative of the SFA shall attest to the regularity of all procedural acts in the file, by a detailed technical note;
- the Federal Superintendent of Agriculture, Livestock and Supply at the UF, after analyzing the process and receiving the opinion of the local Legal Advisory or the Legal Advisory Center at the UF, must request the necessary financial resources;
- MAPA's Legal Consultancy must establish whether the process can be finalized in the SFA itself or if there is a need to forward it to the DSA and the SDA for manifestation and authorization; and
- After completed, the process must be filed with the UF's SFA of location of the property.

Below, there are brief recommendations on each of the main activities involved in the elimination of the outbreaks. It is of vital importance to reinforce that complementary readings, such as those indicated in the Introduction of this Contingency Plan, in the preparation of work teams.

2.3.1. Evaluation

It aims to establish the values of animals and other destroyed property in consequence of animal health emergency actions, to support the legal process of indemnification of the producer. The work must be carried out by a commission appointed by act of the Federal Superintendent of Agriculture, Livestock and Supply of the respective UF (suggested model available in Attachment 7), consisting of a veterinarian of the Federal Service, a representative of the State Government and a representative of the productive sector. The head of the work of each committee is the responsibility of the veterinarian of the Federal Official Service, as established by Law No. 569, of December 21, 1948 (amended by Law No. 11.515, of August 28, 2007, and regulated by Decree No. 27,932, of March 28, 1950).

There is need to highlight the importance of the indemnification process, to increase community confidence and encourage the notification of suspicions, facilitating epidemiological investigations and disease containment.

Animal killed and destruction of property activities can only be carried out after evaluation by the Commission, and it is of fundamental importance that the professionals involved are ready to carry out the work at any time. To avoid injury and delays in the work of eliminating sources of infection, in the animal health emergency declaration, an appropriate number of evaluation committees should be appointed, with their respective alternates.

The evaluation must follow values, standards and criteria agreed with the Coordination of field work, listed in the sources and references. All members of the committees created must be aware of the legal procedures involved and have experience and should be familiar with the activity.

The evaluation of the animals should preferably be carried out in the place where they are, based on market values (published by institutions of the sector) in the face of racial, genetic characteristics, economic purpose, sex, age and other elements, at the discretion of the commission. The physical status of animals due to the disease should not be considered.

In relation to objects or constructions, the evaluation is made by estimating the expenses (market value) which, at the commission's discretion, are necessary for the replacement of objects or reconstruction of facilities.

After the calculation of the values, the evaluation committee should draw up the evaluation records (suggestion of models in Attachments 8, for animals, and 9, for items and constructions), with the amount to be indemnified and the criteria applied, serving as the basis for the legal process of indemnification of the owner.

It is worth noting that the speed with which the compensation of producers for animals and other destroyed goods is one of the determining factors of the success of animal health measures adopted. The delay or suspension of euthanasia of animals or destruction of property due to possible discrepancies between the values in the assessment documents and the values desired by the producer, who is entitled the right to claim subsequently in court, is not justified.

In the event of slaughter, the indemnity corresponds to the difference between the amount paid by the slaughterhouse and the market value of the animal.

After the killing for elimination and the destruction of items and construction, the responsible teams must record the records of killing and destruction (models in Attachments 10, for animals, and 11, for items and constructions) that will serve as the basis for the legal process of indemnification of the owners.

In the case of animals of proven zootechnical value, depending on the epidemiological evaluation, differentiated procedures may be adopted as an alternative to euthanasia or slaughter, provided that these are not infected animals or that they represent a high risk of diffusion or maintenance of the viral agent.

2.3.2. Sanitary sacrifice or slaughter (euthanasia)

This activity must be coordinated by a veterinarian of the official service. If the killing of animals involves the use of firearms, it must count on the support of trained professionals, especially the public safety or defense agencies. In view of the impactful nature of the activities to be carried out, the team must be formed by personnel with dexterity and adequate psychological preparation. For safety reasons, only those persons authorized by the veterinarian responsible for the work, whose presence is indispensable, may accompany or be present at the place of slaughtering.

The main references for conducting this activity are Chapters 7.5 and 7.6 of the OIE Terrestrial Code. Special attention should also be given to Resolution No. 1.000 of May 11, 2012, of the Federal Council of Veterinary Medicine.

The sanitary slaughter of the animals in each rural establishment can only be initiated after the evaluation of the animals by the Evaluation Committee. Its performance must also be preceded by the definition of the form and place of destination and destruction of the slaughtered animals, with all the necessary structure for the displacement of carcasses. In the event of burial, sanitary ditches should be adequately available, and, in the event of incineration, the site must be properly prepared and the material to be used as fuel shall be available. The definition of the place of destination of the animals must have the opinion of a professional of the environmental agencies.

The work should also be coordinated with epidemiological research activities, which involve clinical inspection and collection of blood serum samples. This work will allow the more precise knowledge on the incidence of clinical and seropositive patients in the affected herds. Especially for sick animals, predict the collection of significant quantity of blood serum for a database composition of seropositive animal samples, for use by reference laboratories in the preparation of control sera and conducting studies of sensitivity and specificity of laboratory tests.

The choice of the euthanasia method should consider the references presented above and, where possible, should occur in the following order:

- animals with clinical signs of FMD (primarily swine, followed by cattle and small ruminants, considering the viral excretion potential of these species);
- animals that had direct contact with clinically affected animals; and
- other animals.

Euthanasia should take place as close as possible to where the animals are and, at the same time, as close as possible to where the carcasses will be destroyed, taking into account the geographical and land conditions of the area, the effort to move the animals or carcasses and the risks of spreading the disease, always counting on the opinion and, when available, the monitoring of environmental agencies. When, in the emergency area, there is availability of slaughterhouses, an option to be considered is the sending of animals for slaughter, under the follow-up of the SVO.

After the elimination of the animals, the team must prepare the stamping-out policy notice (Attachment 10) that will serve as the basis for the legal process of indemnification of the producer.

2.3.3. Destruction of carcasses and FMD risk materials

The main options for the destination of the carcasses of animals are burial or cremation, or an association between the two. As highlighted, the place for burial or cremation should be chosen with the participation of professionals appointed by environmental agencies.

The sanitary ditch is the place where the carcasses are buried and may also be the place where the euthanasia of the animals takes place. In general, it is composed of two parts: the access ramp and the sanitary ditch itself. The access ramp is an inclination of approximately 10m in length, which allows the ingress of the mechanical shovel and animals. The sanitary ditch is the deepest place, destined for disposal (euthanasia) and subsequent sanitary burial.

The recommended dimensions for the sanitary ditch are 3.5 to 4.0 m deep by 3.0m to 5.0m wide and a length that is determined by the species and the number of animals committed. For each adult bovine there is requirement of a sanitary ditch surface of 1.5 square meters. With reference to sheep and pigs, consider that an adult bovine is equivalent to five animals of those species. Based on the experiences obtained in the animal health emergency occurred in Mato Grosso do Sul, 2005, it is recommended that the ditch does not include more than 700 animal units (1 animal unit = 450 kg).

The following calculation is used to calculate the length (C) of the sanitary ditch: $C = S/L \times n$, where S = surface, L = width and n = number of adult bovines. Therefore, considering the width of the ditch of 3.0m, the surface equal to 1.5 square meter per animal and the total of 50 adult cattle, the length of the sanitary ditch would be:

- Length for 50 adult cattle = $1.5m^2$ / 3.0m x 50 = 25 m (not counting the access ramp)

In practice, the following values are used to calculate the length of the sanitary ditch:

- Bovine → number of adult cattle x 0.5
- Sheep, pigs, and calves → Number of animals x 0.1

The ditch should be excavated in the form of a slope (sloping walls) to avoid possible collapses. Demarcation piles are fixed, considering that, to obtain a ditch width of 3.0m, excavated in slope, the surface width must be 5.0m. The floor of the ditch must have an inclination that reaches the depth of 4m in the final 10m, being convenient to mark the point, from which, the floor of the ditch must reach 4m depth. The land should be deposited at not less than 1.5m from the edges of the ditch in order to facilitate the displacement of the shooters.

The option of killing the animals inside the sanitary ditch will depend greatly on the docility characteristics of the animals. When this option is used for the discharge of cattle, the lateral parts of the route from the ramp to the access to the ditch, some 7.0m long, must be protected on its sides by a plow or other structures. The animals must enter the sanitary ditch in groups not larger than ten, for the case of adult cattle, nor larger than twenty for sheep and adult pigs. The mechanical shovel is at the opening access to the ditch to block the exit of the animals. The slow displacement of the mechanical shovel allows the animals to move to the deepest end of the ditch. At all times, unnecessary screams and noises must be avoided as they uselessly alter the tranquility of animals.

A basic equipment formed by a 3.0m cubic excavator and a 2.0m cubic backhoe is the most recommended. To build a 50m long ditch, about 14 hours of work (one and a half days) are required, depending mainly on the characteristics of the soil. It should be considered that, from the 50m length of the ditch, the speed of the excavation progress decreases, since the backhoe must retreat to throw the earth to the outside.

The most suitable place for the disposal of the carcasses of the killed animals is within the establishment of location of the animals, in the sector where the sick animals and contacts are housed. However, that the place must meet have the following requirements:

- distance from populated centers (safety and discretion);
- away from the permanent premises of the establishment (houses, corrals, sheds, toilets, hoses etc.);
- easy access for vehicles and heavy machinery;
- terrain without major difficulties for excavation;
- groundwater at a depth of more than 8 meters;
- distance from surface watercourses (rivers, ponds, streams, etc.)
- underground without aqueducts, gas lines and pipelines; and
- an area proportional to the number of animals involved in the emergency.

If burial is necessary in another place, it is convenient to kill on site and subsequent transfer of the remains (adopting strict biosafety measures) to a place that gathers the conditions required for sanitary burial. The carcasses must be transported to the place of their burial in a tipper truck, adopting procedures to prevent the exit of fluids.

Depending on the place available for opening the sanitary ditches, the convenience of using waterproof blankets should be evaluated with environmental professionals, aiming at the protection of the groundwater.

Inside the ditch, officials indicated by the SVO should perform the evisceration, and drilling of the rumen of ruminants, as well as the opening of the thoracic cavity in the intercostal space, in order to avoid the formation of gases that cause the volume increase of the sanitary ditch after the burial of the carcasses. Lime and other chemicals that may delay the natural decomposition process that favors the inactivation of the viral agent should not be used.

To obtain a better use of the physical space of the ditch, after opening the cavities of the dead animals (in the case of ruminants, it includes the rumen) the remains are accommodated with the mechanical shovel).

The ditch should also be used for the purpose of organic materials and remains from the cleaning of animal containment establishments (corrals, paddocks, etc..).

Once the elimination of all animals, materials at risk for FMD and burial is completed, excessive compaction should be avoided, since it favors the formation of crevices or cracks, through which gases may emerge as a product of organic decomposition. The center of the ditch must be at least 0.50 m higher than the edge, facilitating water flow and avoiding puddles. **After covering the ditches, it is recommended to surround the area with nets or wire screens, entering at least 30 cm into the ground, to prevent small animals from approaching and starting to excavate the place**.

In case of opting for cremation, the site should be chosen carefully, considering the prevailing winds, the proximity of other facilities and crops and isolation, to avoid curiosity. It is possible to avoid that the emerging odors harass the neighbors and the community at large.

The cremation ditch should be around 1.0m deep and 3.0m wide. The length will depend on the number of animals. It is necessary to be completely sure that all the corpses, placed side by side, fit in the ditch to be burned at once. It is convenient to make a cross switch channel, at every 2.0m, with a 0.70m width, starting at ground level and descending until reaching the same depth of the main ditch. A bed of firewood or thick wood should be placed, transverse to the ditch, which must be filled with straw, fine thin firewood, or charcoal, soothed in kerosene or diesel oil. Old tires help in combustion and it should be necessary to have some of them to stimulate the fire.

The corpses of the animals should be lined up above the bed, alternating head and paws. It is necessary to try to keep the channels open to use them to load firewood or coal and thus maintain a good fire. It is estimated that about 6 tons of coal, 1/2 ton of firewood, 75 liters of diesel and 45 kg of straw or small firewood are needed to burn 50 cattle corpses. It can be calculated for these purposes that five sheep or five pigs are equivalent to one bovine. Pigs burn much better due to body fat and do not require as much combustible material. Of course, all these estimates vary depending on the conditions of the site. After the end of cremation, the ditch should be covered with earth, maintaining the same recommendations for the use of ditches for burial.

It is recommended to check, with at least one weekly periodicity, the state of the sanitary ditch until a reasonable period has elapsed since euthanasia and burial or cremation of the animals. Measures should be taken in case of abnormalities, such as disruption of protective fences, presence of cracks or presence of rodents and dogs, among other problems. The geographical coordinates of the sites of the sanitary or cremation graves should be taken.

After the job is finished, standards of hygiene and disinfection of vehicles, materials and personnel must be strictly complied with.

2.3.4. Epidemiological investigation of outbreaks

The work should be carried out jointly by the sectors of outbreak elimination and epidemiological analysis and report, members of the Field Operations and Planning Coordinations, respectively.

The investigation team is responsible for obtaining data and information for better investigation of the outbreak, including clinical inspection of killed animals and sampling for laboratory tests, seeking greater knowledge about the dispersion of the viral agent. Preferably, to optimize the management of animals, the work should be associated with evaluation or euthanasia activities. Ideally, all susceptible animals should be examined and collected for blood serum samples. Each animal should be classified according to the presence of vesicular lesions, estimating the "age" of the oldest lesion. If it is not possible to perform the examination and collection in all animals of the outbreak, the work may be carried out by sampling, with random selection of the animals, according to susceptible species and representatively for all paddocks, pastures or other structures of segregation of animals.

The standardization of activities is of great importance for achieving the results and, to do so, the team must have scripts and research forms, as well as adequate material for sampling.

The information generated is exclusively used by the SVO for deeper knowledge about the epidemiology of the disease, and its use is not fit as an element for questioning the occurrence of the disease or for the purpose of indemnification.

2.3.5. Cleaning and disinfection

The work begins after euthanasia and burial or cremation of animals, including sealing of sanitary ditches, disinfection of corrals and eaters, burning of hay and other contaminated materials, and disinfection of contaminated pickets.

The disinfection procedure depends, in each case, on a variety of circumstances such as the structure of establishments or corrals, the places to which sick animals have had access, the quantity of manure, the nature of the products which are considered contaminated, among others.

The most important factor to ensure the inactivation of a causal agent in an infected property consists in the performance of a preliminary disinfection, followed by cleaning and complete washing and subsequent definitive disinfection.

It should be noticed that virtually all substances used in disinfections are toxic into a greater or lesser extent. Thus, appropriate measures should be taken to protect health, such as the use of personal protective equipment appropriate to the task, including masks that prevent inhalation of chemicals.

Special emphasis should be given to all equipment and machinery used in the job of opening the ditches and sacrificing the animals. Cleaning and disinfection should be thoroughly developed because they are objects that have been in direct contact with sick animals and can carry the virus mechanically. Therefore, prior to the abandonment of the place where euthanasia and burial took place, the vehicles and machinery used must be properly sanitized and disinfected.

As for clothing, when disposable, they should be incinerated *on the spot,* with the remains buried in the sanitary ditches. Non-disposable clothing must be properly bagged for transfer to the place of washing, disinfection, and sterilization.

General guidance on disinfection work, as well as list of the main disinfectants recommended for FMD, is available in Attachments 12 and 13.

2.3.6. Outbreak termination activities

The work must be carried out under the responsibility of a veterinarian of the official service and includes the phases of sanitary void; introduction of sentinel animals; and restocking of the sanitized area.

The sanitary void begins after the completion of cleaning and disinfection activities of facilities and equipment. Its duration should be of at least 30 days.

During this period, the property shall be subject to special surveillance to ensure the absence of animals susceptible to FMD. It is important that all property boundaries are covered to assess the conditions of the fence. Any irregularities must be corrected to prevent the entry of animals from neighboring properties in the area in elimination.

After the end of the period of sanitary void, and at the discretion of COEZOO, sentinel animals can be introduced in the area.

Young cattle or pigs under 45 kg, as well as sheep or goats, free of antibodies against FMD, may be used as sentinels. It is important that sentinel species are species affected by the occurring viral strain. Preference should be given to the bovine species because they are more susceptible to it.

Animals should proceed from disease-free properties and, before entering the elimination area, they should be evaluated for the presence of structural and non-structural antibodies against to FMD, with the participation of only seronegative animals and those without any indication of vesicular disease. Before entering the property, sentinel animals should be dewormed, with products that do not stimulate the immunocompetent system. Preferably, they should be submitted to premunition against the hemoparasites present in the country, avoiding possible interference in the operative procedure.

In addition to the health characteristics of sentinel animals, other important issues should be considered: origin of the animals; agent responsible for the costs of acquiring and treating the animals; agent responsible for the transport of animals; destination of the animals after the end of the activity. The decision-making for the use of sentinel animals should be made right from the beginning of elimination work, so that there is adequate time for their selection and preparation.

The number of sentinel animals will depend on the size, management, topography, and number of animals that are normally reared on the property (suggestion: 5% of the usual population of the property, recommending at least five animals).

All animals must be identified with a double earring or electronic chip. They should remain on the property for at least two periods of FMD incubation (30 days) and inspected daily, with blood serum samples taken at 15 and 30 days of introduction. **Animals should have free access to areas previously exposed to FMD virus contamination**.

When FMD is evidenced in the sentinel animals, the case should be properly reported and all animals should be eliminated, restarting the process of elimination of the outbreak.

At the end of the work, if laboratory and clinical inspection results do not indicate the presence of FMD virus, the sentinel animals may form part of the population of the property or proceed to slaughter with official inspection and for domestic consumption, according to the definition agreed at the beginning of the work. Under these conditions, livestock restocking of the property may be allowed, with 20% of its original population. These animals will be checked for 60 days, with weekly inspections, and at the end of the period, the owner will be authorized for full restocking.

2.4. Control of the movement of animals and risk products

The work involves the management of fixed stations and mobile teams of surveillance, with the objective of controlling the transit of animals, products and by-products of risk, including the movement of people and vehicles that can carry the viral agent, thus seeking to avoid the spread of FMD virus to other areas without occurrence of the disease. The implementation of fixed stations and the action strategies of the movable teams represents a dynamic process that should be conducted in line with the General Coordination of COEZOO and with the Planning Coordination, based on previous analyses of the flow of movement of animals, maps or geographical charts of the region, containing road network, hydrography, topography, preservation units, among other elements that may present themselves as physical or natural barriers. At any time, the layout of fixed stations and the direction of the movable teams can be modified due to more accurate analyses of the region or the emergence of new outbreaks.

Due to the complexity and particularities that involve the implementation and management of fixed inspection posts, it is important that the managers of contingency plans within the framework of MAPA and the UFs prepare and publish in advance "***Standard Operating Procedure (POP) for Fixed Stations and Mobile Teams in Animal Health Emergency***". This POP should include information and guidance on the minimum structure necessary for the implementation of a inspection post (infrastructure, human resources and documentation); guidelines on the surveillance of the transit of animals, persons, vehicles, food, equipment, grains, plant crops, among other elements (should specify and detail what is authorized, considering different levels of risk of dissemination of the viral agent – make available tables with the relationship of products and materials of risk for FMD and their procedures at the checkpoints). Guidance on the function, presentation and conduct of the on-call in different situations (forms of approach and procedures during product seizure and in front of a vehicle fleeing surveillance, for example) should also be included. Mobile structures such as vans and trailers, as well as materials for tents and barracks and their complementary structures, should be available for ready use in Federation units, such as spray pumps, tanks and electric power generators.

In general terms, the movable teams of inspection will act in a complementary way to surveillance actions, having as main objective to assist the fixed inspection points in the supervision of the movement and irregular traffic by points or trails that are not used frequently, as well as stoppage of traffic between rural properties without prior authorization. The movable teams may be requested, at any time, to escort the transport of live animal vehicles for slaughter in refrigerated establishments or transport of any other type of product or by-product duly authorized by the SVO. Specific teams should be provided to go through all the fixed stations, providing necessary support and supplying materials, equipment and supplies, as well as the supply and distribution of food to all on-duty workers. This distribution should have as many teams as necessary, so that the food arrives with quality and at times consistent with daily meals.

As for the fixed stations, as soon as the location is defined, the responsible sector should carry out the registration, including the following information: date of implementation; name/code that will be given to the Post, usually by association with a locality; brief description of its location (e.g. Road A, Km xx, junction with road B); geographical coordinates.

At the time of the closure of the fixed inspection points, their registry should be updated with information on the date and reason for closure.

It is essential that all established checkpoints maintain visible warning signs at least 150 meters in both directions with signs containing terms such as "SANITARY SURVEILLANCE - MANDATORY STOP". Similarly, movable crews must have minimal equipment for operation: cones, signaling plates, tents barracks type that may be quickly assembled and disassembled, tables, chairs, among others.

Where fixed stations involving disinfection must be placed on roads or roads with high vehicle movement flow, measures should be taken to install disinfection points or twirls, or otherwise ensure the perfect disinfection of vehicles without prejudice to congestion.

It is recommended that both teams that will work in fixed stations and in movable teams are composed of at least two servants of the official service and two police officers. These activities may be carried out by previously oriented mid-level technicians.

Once the fixed stations are deployed, the service should operate uninterruptedly with the mandatory presence of police officers. The servers will work on 24-hour duty periods. Each exchange of on-duty workers must be registered in their own forms, with registration in the animal health emergency database. Before being placed in their fixed points, on-call workers should receive specific instructions for the fulfillment of their activities and should be constantly supervised, reinforcing the importance of having a POP for quick consultations and mandatory reading by all on-call workers. The logistics of the exchange of the on-duty workers should be carried out jointly between the Traffic control and Infrastructure Sector and COEZOO management. The latter must be notified about the demand for supplies such as disinfectants, water supplies, food, forms, fuel, equipment maintenance, among others.

If it is not possible to implement all fixed stations at the same time, priority should be given to the outbreaks and the boundaries between the perifocal area and surveillance area, especially on the roads and highways with the highest traffic flow. Over time, and with other more detailed assessments (information coming in from epidemiological surveillance teams) they can be reevaluated until they achieve an excellent blockade of the region. The deployment of fixed stations on Federal or State roads must be agreed in advance with the respective highway police.

Specific cases are represented by the fixed posts deployed in the access to the outbreaks, ensuring compliance with the established interdiction. In these locations, biosafety measures for cleaning and disinfection of vehicles, people and equipment should be strengthened.

It is necessary to foresee that moveable teams will be designated and will permanently going through the barriers installed within a territorial extension, with the task of supervising the procedures performed, assisting communication and supply, especially those of difficult access and assisting in the mobilization and demobilization of barriers, whenever there is a review of the strategic points of blockade.

In order to facilitate agility among the most diverse situations it is recommended to install means of communication by voice or text message between fixed stations, movable teams and the coordination of the traffic control sector. These can also help in the agility of the arrival of information to COEZOO, as well as in decision making, including in a situation of registration of new outbreaks.

Every community should be clearly and objectively oriented about the animal health emergency situation installed, clarifying the risks of dispersion of the agent and the measures of prohibition or restriction in the movement of animals, people, materials and equipment between the different delimited areas. For this, it is essential that the education and media sector act quickly, clarifying the society of the actions that should be adopted. Clarification of the risks represented by different products should be disclosed in different ways and by different means of communication, in order to support the control at fixed stations and by the movable teams. As an example, the simplified table below seeks to classify and group by type of risk of transmission of

FMD virus, the main objects, products or animals, attributing to them a risk (low, medium or high) according to the innate ability to contain, sustain and transmit the viral agent. This table should be complemented and better detailed in *POP for Fixed Stations and Movable Teams in Animal Emergency health* and present itself as a source of information for the preparation of communication material with the affected locations.

Table 3. Example of categories at risk of FMD and related products

Risk category	Description of product, animals, etc.
High risk	• susceptible animals (cattle, buffaloes, sheep, goats and pigs) • milk and other products and by-products of susceptible animals • genetic material derived from susceptible animals
Medium risk	• non-susceptible animals • items in general that maintain a direct contact with susceptible animals • vehicles, including milk trucks, agriculture trucks • products non-derived from animals with some vegetal crops derived from outbreaks or facilities close to outbreaks • persons that render services to rural properties
Low risk	• persons non-linked to rural properties • packed products derived from animals • agriculture products non-derived from outbreaks or facilities close to outbreaks • vehicles not linked to rural facilities

The teams that make up the fixed posts should be instructed to enter and record all movement and traffic that occurred during their stay at the site. These forms must be provided for in the POP for Fixed Stations and Movable Teams and will serve to include the data in the computerized control system of the animal health emergency database.

As a result, it is expected that reports will be issued containing, for a given period and post, for example:

- number of vehicles inspected;
- arrest and destruction of products and by-products;
- total occurrences of irregular traffic of animals;
- destination of animals and products caught in transit without prior authorization;
- average amount of disinfectants used per day; and
- products and animals (by species) that have been moved by the fixed stations.

Upon returning from duty, depending on the need for work and the availability of servers, employees can support administrative activities, such as entering the data into the computerized system, provided that there is no compromise of the rights of the servers.

Risk mitigation measures in the transit of animals, products, vehicles and people should always be sought in order to continue agricultural activity in the affected area.

2.5. Surveillance activities

This is an action of fundamental importance in animal health emergency activities, considering that the basic objective of all work is to identify and eliminate potential sources of infection. In these activities, there is the participation of a large number of professionals who must carry out surveillance and inspection in all rural establishments that may house animals susceptible to FMD located in the emergency area. The effort made is the main indicator of the quality of the work performed.

The management of the significant number of professionals involved in these activities is one of the major challenges in the care of animal health emergencies, requiring strict control by the coordination sectors. Professionals need to be guided on work priorities and organized according to epidemiological risk areas.

In addition to the descriptions already presented in this document, we highlight the specific objectives of the veterinary surveillance sector:

- to carry out screening and investigation in establishments with epidemiological link with outbreaks of FMD, aiming at the rapid containment of the disease;
- carry out clinical and epidemiological research in establishments with animals or products at risk for FMD located in the emergency area;
- ensure early detection, adequate care for suspected cases of vesicular disease and adequate collection of material for laboratory diagnosis;
- seek elements that lead to the identification of the primary case and the origin of the outbreak (outbreaks); the definition of the degree of spread of the disease; and the definition of disease control and elimination strategies;
- demonstrate, through records and maps, the effectiveness of surveillance actions during the eradication of the disease; and
- carry out health education actions in the inspected properties, aiming to ensure cooperation and community participation to prevent the spread of the disease and obtain rapid eradication.

Among the attributions and responsibilities of the veterinary surveillance sector, we highlight:

- coordinate the distribution of field teams according to the different areas of epidemiological risk;
- manage the achievement of epidemiological research targets, including the frequency of inspection of rural properties, according to the different areas of epidemiological risk;
- seek the identification of probable or confirmed cases of vesicular disease, as well as compliance with the guidelines of the **Vesicular Disease Investigation Manual** provided for the case;
- ensure that the completion of the investigation forms is complete, accurate and clear; and ensure the proper registration of all activities and their inclusion in the information system;
- ensure that surveillance teams comply with the planned epidemiological research activities and procedures, including biosafety measures and guidance to rural producers on prevention and restriction measures imposed in the area of animal health emergency; and
- assess and propose appropriateness for research activities in the restricted area.

Given the attributions presented, the surveillance sector depends on human and material resources in an adequate number for the good performance of its activities. When possible, the head of the sector should have one or more advisors, mainly dedicated to logistical support to surveillance teams, allowing the manager to be able to perform analysis of the results of the work, report to the other sectors of COEZOO and define the strategies according to the evolution of the emergency. The sector must prepare, in advance, the daily routes of work teams, keeping them available at the base of COEZOO.

As highlighted in previous items, the composition of surveillance teams should have at least one veterinarian from the official service and one or more technical assistants, preferably with good knowledge of the region (assess the possibility of hiring local professionals). Teams must have vehicles suitable for the region (ordinary cars, regular or four-wheel drive trucks, speedboat, among others), GPS devices, materials to support the containment and examination of animals and communication equipment (mobile phones, radios, satellite communication equipment etc.). The fuel supply procedures, as well as the change of lubricants and basic maintenance must be properly provided for.

It is important that teams are numbered at the beginning of operations and remain with the same number until the end, even if changes in their composition occur.

The strategy for the design and distribution of surveillance teams should consider operational, geographic and agroproductive aspects of the region involved, such as:

- available resources (personnel, vehicles, facilities, equipment and materials);
- number of herds initially infected and their contacts;
- quantity and size of farms and herds located in the different areas of epidemiological risk;
- intervals between inspections and surveys at the establishments;
- agricultural production systems predominant in the emergency area;
- intensity of movement and degree of technicality and concentration of animals;
- species involved and their densities (pig farming, bovine milk farming);
- estimate of the geographical extent and duration of the outbreak;
- specific characteristics of the virus subtype related to the outbreak; existence of physical and natural barriers;
- climate and season; and
- conditions for the displacement of teams.

Thus, the head of the veterinary surveillance sector should seek to quickly gather the data and information mentioned above in order to define the demands of teams and resources to meet the needs.

The distribution of teams within epidemiological risk areas should be divided into sectors, according to the Planning Coordination and the number of available teams, considering characteristics of the region and emergency. It should be remembered that the frequency of inspections will be higher in areas of greatest risk.

The intervals between inspections and inspections survey of the establishments directly influence the dimensioning and should soon be defined by the General Coordination of COEZOO, with the support of the Planning Coordination. In general, they depend on the evaluation of the behavior of the health emergency (outburst rate, morbidity, number of herds, production characteristics, etc.) and on the resources available.

As a general rule, in emergencies for FMD, the investigation of properties in the peripheral areas of the outbreak should provide for inspections at least every three days in order to detect early the appearance of clinical signs of FMD. The inspection of the peripheral areas will start by properties adjacent to the outbreaks and should be very detailed, being directed mainly to the inspection and clinical examination of animals, investigation of possible movements of animals, products and people associated with the detected outbreaks. In large-scale properties and at risk of disease cases, consideration should be given to maintaining a technician permanently to ensure early detection of clinical signs.

In all properties investigated, guidance and clarification on signs of the disease, mandatory immediate notification of suspicions, prevention and biosafety measures, restrictions imposed and actions related to the condition of animal health emergency must be presented.

Among the studies to be carried out, we highlight the need for herd inspection, clinical examination of susceptible animals and census of all properties investigated. This work should be carried out considering the subdivisions of the emergency area (infected, surveillance and protection), with distinct teams for each one. Inspection work should be organized in order to reconcile the needs of quality and speed in an emergency action and avoid risks of dissemination of the disease.

Surveillance of the properties of the perifocal area should continue until at least 15 days after the completion of cleaning and disinfection activities at the last infected property in the area.

In the surveillance area, surveys should be carried out at least once a week on herd farms. Parallel serological surveys can be evaluated in conjunction with the Planning Coordination and the General Coordination of COEZOO.

In all health education material and community services, the means of contact with COEZOO (telephones, internet, etc.) and the need to report and report herds with signs compatible with vesicular diseases and producers that commit irregularities of movements and vaccinations should be highlighted. Thus, the veterinary surveillance sector should maintain full-time care of these means of communication, provide availability of staff for care, evaluate the origin and prioritize the attendance to complaints and notifications.

It is highly likely that the index case is not the primary case, so tracking information, animal movements, products and people should help locate the said primary case.

Team professionals who met probable or confirmed cases of vesicular disease should take all biosecurity care and stay for at least 24 hours without visiting another property with susceptible and unaffected animals. This same procedure should be performed to change teams from the areas of greatest risk to those at lower risk, which is not necessary in the reverse situation. Ideally, professionals from veterinary surveillance teams that identify probable cases of vesicular disease should be dedicated to investigations and actions on the property served and, in the case of FMD confirmation, participate in the outbreak elimination work.

In abandoned properties, without the presence of a guardian or locked with padlocks located in the perifocal or surveillance areas, the owners should be sought and if they are not located, the General Coordination of COEZOO should be consulted as to the authorization for access and conduct of the necessary inspections.

In many cases there will be a need to hire rural workers, guides and materials or vehicles from the locations involved to make the activities feasible, and there should be provision of resources by the Administrative and Financial Coordination for the payment of these expenses.

In the area of protection, when this modality is used, activities should include general inspection of susceptible animals, with periodic inspection of herds in a time interval that will depend on the characteristics of the region and operational capacity, but which is sufficient to certify the absence of cases.

In preparation of the surveillance teams for the activities, prior to the beginning of the work, the head of the surveillance sector should gather the members of the teams to pass on guidance on the work system, aiming to avoid errors and standardize the procedures, reinforcing that the POP of this activity is represented by the V**esicular disease investigation Manual.**

The schedules for departure and arrival for the teams should be established, in order to ensure the good performance of the work, as well as the safety of the participants and the daily and timely transfers of the surveillance information to the Planning Coordination.

It is recommended that teams be ready to leave the COEZOO base as soon as possible, including vehicle refueling and material conferences the day before leaving the field.

For the return, the teams must be scheduled to be in COEZOO until 18:00, when they must submit the surveillance forms to the control and evaluation of the information sector for the initial check and then, if necessary, the typing of the information in the computerized system.

The technical assistant of the team must provide requests for materials and inputs, in order to ensure their availability and departure from the base at the time established the next day.

The head of the veterinary surveillance sector, with the support of the Planning Coordination, should provide maps, in the most detailed way possible, in paper and in electronic geographic information systems, including the access routes of the region, the natural barriers and the geographical location of properties, establishments and risk areas, as well as possible support points for the teams.

The list of properties to be inspected by veterinary surveillance teams each day should be elaborated by the head of sector, in discussion with the analysis sector and epidemiological report, based on the analysis of the property register and georeferencing made available by the SVS and also the dynamics of the emergency.

The priorities for epidemiological surveillance, defined in agreement with other sectors of COEZOO, and the best travel logistics should be considered, seeking to achieve the greatest surveillance coverage in the areas of greatest risk and in the shortest possible time.

The teams, in possession of the list of properties to be inspected, should define the route that best meets the demand of the activities, predicting the place and time for lunch. Data from existing herds in each property to be inspected should be available for consultation. The trips should be made according to the recommended care for traffic on the roads to be traveled and always carried out with georeferencing (GPS on) to avoid losses and delays and record the routes traveled.

As for procedures during veterinary surveillance actions, professionals should follow the biosafety measures presented in Attachment 01 of this document.

Depending on the extent and area of the property for inspection, you can opt for different procedures upon arrival at the rural establishment. On small properties, mainly from dairy areas, the property's head office is situated within walking distance of the entrance gatehouse. In such cases vehicles should not enter the property. In large properties, often the head office or house is a considerable distance from the entrance and it is necessary to enter the vehicle. In such cases, one should go directly to the headquarters, office or other place, to contact and do the interview with the person or persons responsible for the care of the animals, avoiding entering the vehicle inside the livestock facilities.

The **Vesicular disease investigation manual** includes the procedures and criteria to be followed in epidemiological investigation and care for suspected vesicular diseases in properties (especially basic guide for examination of animals suspected of vesicular disease), which should be reviewed and complied with by surveillance teams.

The investigation should include all the items contained in the Epidemiological Investigation Roadmap for vesicular diseases, in addition to other information relevant to the establishment of possible epidemiological links. Information should be obtained on the populations of animals existing by species and their location within the different paddocks, as well as on the tickets and egresses (regular or not) of susceptible animals or people in the last 30 days prior to communication.

Screening is fundamental for the rapid containment of the sanitary emergency and early detection of linked outbreaks and should be thorough, considering all possible risk factors and possibilities of links with existing outbreaks.

Cases where the anamnesis indicates the possibility of animals with clinical signs compatible with vesicular diseases or links with already confirmed outbreaks, biosafety measures should be strengthened before the examination of the animals. In these cases, the inspection and clinical examination should be carried out directly to the animals located in places where suspected cases were observed by those responsible for the herd, preferably in the same place where they are. To fulfill this objective, request the collaboration of minimum official or private personnel required, avoiding movements and mixing of susceptible animals.

In case of observations of lesions compatible with FMD, the procedures described in the **Vesicular Disease Investigation Manual** should be followed, prioritizing actions for sampling for diagnosis and reinforcement in interdiction and biosafety measures. The team must, after proper sampling and biosafety procedures, terminate the procedures in the affected batch and return directly to COEZOO for delivery of samples and records to the sectors responsible.

The intensity of the inspection should be determined by the head of the surveillance sector in accordance with the Planning Coordination. In small herds, even if the initial interview does not reveal evidence of clinical signs of vesicular disease, it is recommended that the clinical examination of all animals be performed.

In properties with a large number of animals and where the initial interview did not reveal elements that indicate the occurrence of clinical signs compatible with vesicular disease or epidemiological link with the outbreaks, a general survey of the animals of the property should be carried out and the detailed clinical examination should be carried out in a representative sample of the herd. Sampled animals should be randomly chosen from the total herd, involving all susceptible species. In regions where systematic vaccination against FMD is used, sampling should prioritize young animals (up to 12 months) as well as unvaccinated species. In regions where vaccination is not practiced, there is no distinction as to the animal categories to be examined.

Details of the number of animals to be included in the sample and clinical examination at each property will be provided along with property information, according to planning coordination recommendations. As an initial recommendation, all susceptible animals should be examined. However, given the operational impossibility for complete inspection of the herd, the number of animals for examination should consider

statistical parameters of confidence level, minimum expected prevalence of sick animals in the properties and sensitivity levels of clinical inspection. The veterinarian of the surveillance team should also perform a general analysis considering the size and characteristics of each property, the type of management, the number of lots and their distribution, in order to optimize the selection of the animals for clinical examination.

In cases where it is not possible to contain the animals of a herd, it may be necessary to examine and collect samples of loose animals, through the use of ties and other containment measures. In cases where recapture is difficult at a later date, sampled animals should be identified and separated from the herd until laboratory test results are received.

During the general inspection, all animals that present any change in health or behavior should be prioritized for clinical examination and sampling.

At the end of the activities on the property, the clarifications and guidance to the herd managers about the animal health emergency, the procedures for notification of suspicions, biosafety measures and the forecast of the next inspection of the property should be complementary. Leave contact numbers and addresses, as well as educational leaflets on FMD, when available.

Surveillance should also include other establishments such as animal agglomeration event venues, slaughterhouses and dairy products.

Animal agglomeration events (auctions, exhibitions, fairs, bull pursues called 'vaquejadas', rodeos, etc.) pose a great risk for the spread of FMD and their achievements in areas close to the health emergency should be cancelled as soon as the first case of the disease is confirmed (including those already in progress). Surveillance in these establishments should seek data (entry and exit maps) and inspection reports of events that occurred in the last 30 days, in addition to conducting interviews with those responsible for organizing, conducting and supervising the events.

In slaughter establishments for species susceptible to FMD, surveillance shall collect information and reports of the *ante* and *post-mortem* inspection of the last 30 days and also interview the technical officer and those responsible for surveillance. The tracking of shipments of fresh products of animal origin, cold or frozen, should be carried out to avoid the risk of the spread of the disease and possible destination to the international market of products from areas near the outbreaks.

Cold plants are considered important alternatives for depopulation in the restricted area, with conditional use of carcasses, minimizing elimination costs and the risks of spreading the disease. It is also important to gather information on the capacity and conditions of establishments for possible sanitary slaughters.

In the case of plants within the emergency area, they can be used, observing the provisions of the Terrestrial Code.

In dairy farming regions, very well coordinated actions should be established with processing companies. In each dairy facility, one should seek the relationship of suppliers and transporters, the collection routes and the amount of milk produced from the properties of the areas near the animal health emergency and also interview the technical and inspection officers. Information should also be sought to assist in the correct disposal and conditional use of milk from properties involved in the emergency.

Other important localities are those represented by preservation areas or others that maintain wild animals of susceptible species. The SVO has no direct jurisdiction over these areas, so the institutions responsible for controlling them must be quickly communicated and demanded for collaboration and joint action in surveillance activities. For a better risk analysis, information on existing species, density, habits, distribution and possible contacts with domestic species should be collected from those responsible for the area. If cases are confirmed in wild species, a thorough evaluation should be conducted together with technicians responsible for the area, in order to analyze potential risks of dissemination of the disease and adoption of measures. It should be noted that the slaughter of wild animals, besides being extremely difficult and, therefore, inefficient, involves legal aspects and environmental preservation that practically make this type of action unfeasible. Thus, actions should prioritize the elimination of contact of domestic animals with wild species and biosafety measures when the entry and exit of humans and vehicles in the preservation areas.

An important point for veterinary surveillance activities is the recording of surveillance activities. The activities of the surveillance teams and information resulting from the investigations should be duly recorded in forms and in computerized systems, aiming at the rapid demonstration of surveillance coverage on the establishments and enable decision-making by COEZOO.

In the field, the records should be made in individual service forms, contemplating only the strictly necessary information, to avoid loss of time. In the first inspection of the establishment should be filled out a form with more complete data of the property and producers, in order to update registration information, detect possible irregular movements and subsidize possible indemnification actions. For follow-up surveys, more simplified forms should be used, recording the date, time of entry, inspection number and registration of the animal health condition of the herd, in addition to the registration of other information considered relevant by the veterinary surveillance team. The information control system should provide for the preparation, identification and availability of forms for surveillance teams.

In cases where the inspection results in a probable or confirmed case of FMD, the records of the clinical and epidemiological investigation should be made in the documents of care for animal health occurrences in force, following the instructions in the respective manual.

The veterinary surveillance sector should be organized to produce the following reports and materials for the COEZOO General Coordination:

- compiled report of the activities carried out and their results;
- maps of the sites surveyed and routes traveled by the surveillance teams;
- daily report evaluating the results of epidemiological surveillance; and
- technical presentations for use during meetings.

2.6. Reception, preparation and shipment of samples

An important structure for COEZOO is the sector of sorting and preparation of samples and shipment to the laboratory, subordinated to the Logistics Support Coordination. Separate structures should be provided according to the stage of animal health emergency actions. In the initial phase, the sector should be prepared to receive samples from suspicions identified by veterinary surveillance teams and resulting from the work of elimination of outbreaks, following the recommendations of the **Vesicular Disease Investigation Manual**. After the elimination of the outbreaks and absence of new occurrences, activities will begin to demonstrate absence of infection or viral transmission, which includes epidemiological studies, which usually involves a large number of blood serum samples. For each of these phases there will be distinct needs of structure and human resources.

Considering the attributions of the sector, the work team should consider a coordinator who will be responsible for monitoring and supervising the procedures, as well as for the maintenance and availability of materials and inputs to meet the installed demand. It will also assign the support team to the work and its functions, including auxiliaries to: receipt of samples, their conference, evaluation, preparation of samples, packaging, storage and shipment of samples; and conducting daily records and maintaining the files in an organized manner that can be audited (transform into items). An example of organization and workflow for the industry is presented, briefly, in Figure 21. This flow follows a biosafety hierarchy, starting from dirty areas to clean areas.

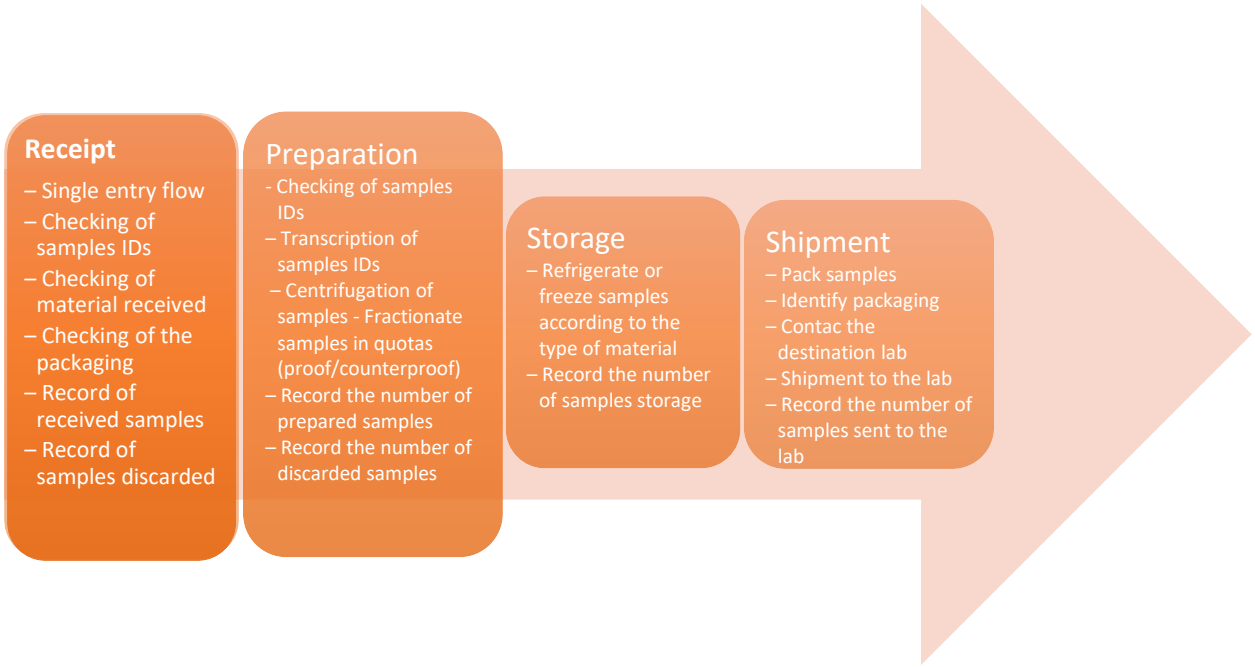


Figure 21. Workflow for the reception and sample preparation sector

It will be up to the Coordinator to distribute responsibilities within the support team, and should consider the work experience and profile of each, and may according to the number of people involved, some actions overlap as long as there is no damage to the progress of the work.

Considering the conditions of collection and preparation of samples in the field, specific resources, materials and inputs are needed, as means of conservation according to the type of sample. The responsible sector should maintain constant interaction with the warehouse sector to ensure the availability of necessary materials and inputs.

As for the physical area, the location should allow an adequate ambience to receive and prepare samples, reducing as much as possible the risks of contamination or proliferation of pathogens. A single input and differentiated flow should be provided for the reception of the samples. Preference should be given to structures in masonry and with floor suitable for hygiene or shaded place, covered with flat and dry terrain. It must have adequate lighting, especially for the nocturnal preparation of samples, and energy points, in sufficient quantity, for the management of equipment. It is essential the presence of sinks installed with continuous water flow to clean materials, hands, equipment and containers, for the collection of contaminant residues for safe disposal. The team responsible for the sector should define the list of specific materials and inputs for use during the emergency.

For each of the steps described in Figure 21, there are specific guidelines and procedures, noting that all samples should be prepared and stored, for possible situations where counterprove is required. The procedures for preparing, packaging and sending the samples must follow the recommendations of the Veterinary Manual for Taking and Sending Samples, 2010, MAPA/PANAFTOSA, the **Vesicular Disease Investigation Manual** and other recommendations of the reference laboratories.

Every animal subjected to sampling must have a single and unambiguous permanent or long-term individual identification, which must be used to identify the vials with the samples. Every sample must be accompanied by a collection form, as established in the information system developed for the management of animal health emergency actions.

The person responsible for the screening and preparation of samples must, daily, record all the activities performed or designate an official server for such action, under his supervision, and shall contain in these records a summary of the daily activities performed, with notes of any irregularity detected or occurred, number of samples received, conditions of these in receipt, type of samples received and prepared, number of samples prepared, number of discarded samples, number of samples stored or sent and description of the shipment (day, time, shipping protocol number, recipient data, sender identification, form of transport, data of the person responsible for contacting the recipient, type of material sent, forms of storage) and other information that may be relevant. All phases involved from receipt of the sample to its submission must be available in registration book, report, or electronic equivalent.

2.7. Emergency vaccination

Once there is an agreement on the use of emergency vaccination, the Field Operations and Planning Coordinations should work together to elaborate the proposals of the strategies to be adopted, seeking to optimize the time of performance of the activity with lower risk for the spread of the disease. Many issues and variables will interfere in the definition of these strategies, both related to the vaccine and its availability, as well as to themes related to the geographical and agroproductive characteristics of the affected region, the estimated population immunity of the susceptible herd, the availability of resources and the epidemiological characteristics of the occurrence.

It should be reinforced that during the preparation phases for action in animal health emergencies, that is, prior to the animal health state of emergency, the ideal is that in each STATE has available information about the structure necessary to perform vaccination in the shortest possible time, considering the different agroproductive realities of the region. Different strategies should be developed, for example, for regions with predominance of large rural properties with extensive animal husbandry, as opposed, for example, to the predominance of land structure represented by small rural establishments or community farms. In general terms, below are some points that should be considered in the definition of strategies to be used for emergency vaccination:

- The strategies should be defined based on a rapid geographical and agropoductive characterization of the animal health emergency area, carried out with the participation of the analysis team and epidemiological report, member of the Planning Coordination. Of course, the quality and detail of this characterization will be directly dependent on the quality of the rural register and the information available.
- It is important that the design of the work has the joint participation of SVO professionals and community representatives, knowledgeable of local realities.
- Once the area for emergency vaccination has been established, COEZOO managers should inform, as soon as possible, the required amount of vaccine doses, along with information on estimated number of rural properties and average herd size (develop histogram considering these two variables).
- Emergency vaccination, when defined as a strategy to be adopted, should be compulsory and carried out under the control of the SVO. Thus, the use of official vaccination (official needle) or assisted vaccination (accompanied) should be defined, according to definitions present in the PNEFA manual called Guidelines for the supervision of trade in FMD vaccines and for control and evaluation of vaccination stages. Of course, official vaccination requires a greater structure on the part of the Veterinary Service, and therefore its feasibility should be evaluated. In practice, the use of these two alternatives should be merged, ensuring the presence of the SVO in all rural establishments involved.
- During vaccination activities, clinical inspection of the herds should be performed, thus highlighting the need for the presence of a veterinarian. This survey can be carried out by sampling, based on criteria defined by the Planning Coordination. In the identification of probable cases of vesicular disease, vaccination should be discontinued, and standard measures provided for in the Vesicular Disease Investigation Manual should be adopted. In this case, the vaccination team should immediately return to COEZOO, avoiding contact with other susceptible herds. During the investigation of the suspicion, vaccination activities should be reviewed, assessing the risks and feasibility of maintaining them or not. In confirming the outbreak of FMD, all strategies adopted should be reevaluated, especially the readjustment of the area planned for emergency vaccination.
- The entire vaccinated herd should be identified in such a way as to allow the proper distinction of unvaccinated herds. Thus, in addition to the availability of the immunogen, the materials necessary for the identification of vaccinated animals should be provided.
- Materials should be provided for vaccination (pistol, needles, etc.), vaccine conservation (isothermal boxes, ice, etc.), animal containment and information recording, as well as materials and equipment for biosafety measures to be adopted at the entrance and exit of establishments. Veterinarians responsible for emergency vaccination activities and their technical assistants should be able to carry out the work.
- All vaccination activity should be properly recorded. The information system to be used for data collection shall include at least the following records per vaccinated herd:
  - identification of the rural establishment (including geographical coordinates);
  - official team responsible for vaccination;
  - date and time of initiation and end of vaccination;
  - vaccinated herd → yes or no. If yes, date and information about the last vaccination performed;
  - laboratory, starting and other relevant characteristics of the vaccine used;
  - existing total number of susceptible animals, by age group;
  - total vaccinated animals, by age group;
  - clinical evaluation of the herd with regards to vesicular disease.

- Information on emergency vaccination should be updated at the end of each day, with the support of geographic information systems for geographical evaluation of the progress and coverage of ongoing activities.
- Depending on the strategy to be used for vaccinated animals (kept alive or referred to slaughter), complementary activities should be established, highlighting:
  - where the strategy involves the slaughter of vaccinated animals, the following points should be:
    - notification to animal owners;
    - restitution or indemnification of the owners of the animals; and
    - identification of slaughterhouses for sending the animals, including definition of the procedures to be used in the slaughter, use and destination of slaughter products, values and method of payment to owners and estimated schedule of sending the animals for slaughter. It is noteworthy that meat and products from the slaughter of animals may not be destined for the international market, except for some specific bilateral agreement.
  - where the strategy involves the maintenance of vaccinated animals, measures should be provided to enable or facilitate the subsequent evaluation of viral infection/transmission, necessary for the restoration of the animal health condition of a country or free zone. The methodology to be used will depend mainly on the size of the area and herd submitted to emergency vaccination, as well as the history of vaccination against FMD in the region. Some possible strategies and methodologies are highlighted below, which should preferably be adopted after the extinction of the outbreaks and after at least two incubation periods of the last case:
    - to collect blood serum samples in all vaccinated animals ("serological scanning") for the evaluation of antibodies against non-structural proteins (PNE) of FMD virus, with slaughter of all seropositive animals or of all animals belonging to herds with identification of at least one seropositive animal. Slaughtering all herds with at least one Serum-positive animal, despite increasing the costs of disposing of animals, reduces the risk of keeping false negative animals and possible carriers of the viral agent.
    - conduct a sample study involving all establishments with vaccinated animals, with slaughter of animals located in herds with at least one seropositive animal. To calculate the number of animals for sampling in each herd, one should work with a confidence level of at least 95%, and conservative intra-herd prevalence, equal to or less than, for example, 5%. The sample size should be corrected according to the sensitivity of the laboratory tests used;
    - perform a two-step sampling study (selection of herds and animals in herds), using strategies involving complementary investigations, including paired sampling in all sampled animals and viral research in seropositive animals. The results obtained, based on the statistical and epidemiological patterns used in the study design, may or may not support the absence of infection/transmission of the viral agent;
    - in order to anticipate or support future work on the evaluation of viral infection/transmission during vaccination activities, in some herds it may be planned to collect blood serum samples or even the maintenance of some unvaccinated animals to act as sentinels. Animals selected for sampling or to constitute a group of sentinel animals must be identified individually of long duration (e.g., earrings with unique numerical identification) allowing subsequent sampling for laboratory testing (paired harvesting). However, the choice of this strategy should be conducted in order to avoid delays and losses to vaccination activity.
- Finally, in each vaccinated herd, depending on the concentration of young animals, the need for revaccination should be evaluated, elaborating a schedule for carrying out this activity.

PART 3

Phase of completion of the emergence of FMD

The phase of completion or closure of animal health emergency actions means the demonstration by the SVO of all the work performed, the results obtained and the effectiveness of these actions. This demonstration shall be carried out in an official and scientific manner, by means of a detailed technical report, ensuring that all declared information and actions taken can be duly proven or audited through appropriately registered forms or documents.

It is necessary, therefore, that this report begins to be planned already at the beginning of the activities, through the organization and compilation of the information resulting from each action of the animal health emergency phase. The responsibility for its elaboration should be shared mainly between the General Coordination of COEZOO and the Planning Coordination, with the support of the DSA.

If there is interest on the part of the country in implementing a containment zone, according to the standards established by the OIE, preliminary report should be prepared contemplating the recommendations present in the Terrestrial Code, with emphasis on Articles 4.4.7 and 8.8.6, version 2019. As mentioned, the recognition of the containment zone has great potential to reduce the losses arising from export restrictions, especially for countries with significant surpluses of livestock production. Thus, once the containment zone has been established, in one of the modalities envisaged, the veterinary authorities must make available to the OIE a report describing compliance with the established conditions, for official recognition.

At the end of the elimination of the affected area, whether or not the strategy of implementing a containment zone is used, a technical report should be prepared to demonstrate the work performed and the results obtained for the containment and elimination of outbreaks of FMD in a country or zone free of disease, covering at least the following points:

- geographical and agroproductive characterization of the emergency area, with a detailed description of its limits and the control measures adopted to ensure separation with the non-interdicted area;
- general information on surveillance activities conducted in the emergency area for at least the last two years in order to demonstrate that this is a reintroduction of the disease. In the case of a country or free zone with vaccination, please report data on the last stages of vaccination;
- chronology of events from the care of the suspect, considering the confirmation of the disease (including details about the diagnosis performed) and the initial intervention actions;
- details of the elimination work of all registered outbreaks;
- result of epidemiological investigation on the probable origin of the disease, epidemiological link between registered outbreaks and dispersion analyses, with emphasis on evaluation of animal movement considering the entire emergency area;
- description of the entire structure and human and financial resources used to contain the disease; detailing in particular the strategy and surveillance activities conducted in the emergency area (total and frequency of inspection of rural properties, workforce, among other items); and
- **detailed description of the epidemiological study conducted to evaluate signs of infection or transmission of FMD virus in the emergency area, informing the scientific standards and laboratory tests used, with special attention to demonstrate the level of sensitivity obtained by the surveillance system adopted.**

ATTACHMENT 01 – Biosafety procedures

Biosafety measures should be rigorous during surveillance activities and inspections for suspected vesicular diseases. In this Attachment some biosafety procedures for adoption by surveillance teams are highlighted, in addition to the **Vesicular Disease Investigation Manual.**

- Equipment and materials needed for biosafety procedures:

  Aiming at better organization of the material and facilitate disinfection, the materials should be placed in resistant, labeled and closed plastic boxes or bags, highlighting:

  - personal protective equipment (PPE): overalls, waterproof overalls, shoe protectors, disposable latex gloves, durable rubber gloves and rubber boots.
  - Adhesive tapes;
  - disinfectants (see Attachment 12);
  - large plastic bags, ideally available at least 2 different colors for the transport of disposal material or intended for disinfection;
  - brushes and buckets resistant for disinfection and drums for transporting water; and
  - Pieces of plastic to line the floor at the disinfection points;
- General measures to prevent contamination:
  - avoid unnecessarily walking through known contaminated areas;
  - avoid direct contact with contaminated materials, surfaces and vehicles;
  - before placing the PPE check that it is without tears or holes;
  - close all PPE gaps with adhesive tapes if necessary;
  - be in favor of the wind in relation to sources of contamination and disinfection aerosols; and
  - do not carry items such as: cigarettes, candies, food, beverages etc. to contaminated areas.
- Precautions that must be taken to minimize contamination of equipment:
  - limit the exposure and contact time of vehicles and equipment with contaminated areas;
  - when collecting samples in contaminated areas, place contaminated boxes and instruments in a clean bag before placing them in uncontaminated areas or vehicles to transport to COEZOO; and
  - when samples are taken, they must be properly packed and placed in bags that allow external disinfection before being transported.
- Suggested procedures for entering properties:

  Stop the vehicle in a safe, dry and clean spot preferably near the gate, if it is small property, avoiding entering. In the case of large properties, enter with the car up close to the livestock facilities, but keeping good distance and choosing dry and clean place. Close vehicle windows to prevent insects and dust from entering.

  It is important to initially define the boundaries of the clean area and dirty area to facilitate biosafety procedures and avoid re-contamination. The procedures for choosing the disinfection point vary according to the circumstances and an individual analysis of the team leader will be required, but ideally it should be:

  a) make a clear demarcation between dirty area and clean area. Preferably in the farm gate or in a place that is easy to delimit and that is not liable to be contaminated. Choose location with water availability for cleaning and disinfection. If this is not possible, provide a reservoir with water;

  b) put a bucket with water, disinfectant and brush on the edge of the clean area;

c) put water and disinfectant in the spray pump;

d) when possible, line a part of the floor of the clean area with a plastic, if it is earthy, fixing it with stones;

e) place a large plastic bag for rubbish in the dirty area;

f) place two large plastic bags in the clean area: one to be placed taken samples and other equipment and one for boots and non-disposable equipment after cleaned and disinfected;

g) note that the three bags must be fixed by ribbons or stones.

h) leave spare packages of plastic bags and rolls of adhesive tape at the disinfection point in the clean area.

- Clothing of personal protective equipment:

a) put the overall in the clean area; when available, the use of waterproof overalls is recommended as they are easier to disinfect;

b) put on the rubber boots, inlaying the legs of the overall;

c) attach the shoe protectors and secure them with adhesive tape if necessary; and

d) put on disposable gloves and secure them with adhesive tape if necessary. It is also recommended to have more resistant rubber gloves for the activities of clinical inspection of animals.

- Suggestions for procedures on the property:

For each property it may be necessary to adjust the procedures depending on the type of facilities. It is important to minimize the number of contaminated items that will be removed from the farm. Therefore, take into the farm only the necessary material. Check all the material before entering. Many items are unnecessary (such as bags and key, among others) and must be kept in the car. Take off the watch, rings, bracelets, necklaces etc. and leave it in the vehicle. Forms, mobile phones, camera and GPS device should be placed in individual and sealed plastic bags.

While working at the property you should avoid eating, smoking or drinking.

- Preparing to leave the property:

Take advantage of farm washing facilities to remove visible dirt from used materials and boots as much as possible, reducing contamination at the disinfection point.

After clinical surveillance and sampling procedures, professionals should separate all non-disposable items, which should be washed with water, soap and brush, and then disinfected and stored in specific non-disposable bags, sealed and disinfected again on the edge of the clean area, before being placed in the vehicle.

Used disposable items should be placed in plastic bags of disposable material for incineration or burial on the farm. If it is not possible to perform these procedures, disinfect the outside of the bag, place it in another closed plastic bag, disinfect at the limit with the cleaning area, put in the trunk of the car and deliver to COEZOO for correct destination. Perforating or cutting materials must be placed in specific devices or pet bottles before being placed in garbage bags.

- Leaving the property:

In the dirty area of the disinfection point, clean and disinfect the boxes of material and samples, bag the equipment and transfer them to the clean area.

The removal of personal biosafety equipment should be in order, after washing and disinfection of all instruments that will go to the clean area, in order to protect against exposure to potentially infectious materials. It is recommended that the following points be:

a) clean and disinfect cell phone bags, cameras and GPS and put in garbage bags in clean area;

b) remove the shoe protectors and place them in the garbage bags of the dirty area;

c) clean and disinfect rubber boots and brush gloves, including soles;

d) clean and spray the overall with disinfectant, taking care not to get any part without disinfection;

e) remove the overalls taking care so the outside does not come into contact with the cloth clothes;

f) put the overall on the specific bag in the clean area;

g) remove the gloves, taking care not to touch the hands on the outside, and put them in the garbage bag. If they are reusable rubber gloves, they should be washed, disinfected and placed in the bags along with the overalls;

h) move into the clean area by stepping on the plastic when available;

i) clean and disinfect the boots again;

j) remove the boots and put them in the bag along with the overalls in the clean area;

k) close the plastic bags containing the samples, equipment, boots and overalls in the clean area using adhesive tape;

l) put on the shoes;

m) clean and disinfect hands and wrists;

n) unpack the cell phones, cameras and GPS and discard the bags in the garbage bag;

o) clean them and disinfect them in the clean area. Dump the disinfectant debris on the steering wheel of the vehicle or the plastic floor and place it in the garbage bag;

p) place bags with clean samples, forms and materials, not taken for activities, inside the car or in a place defined as clean area of the vehicle;

q) place bags with non-disposable and externally disinfected waste materials in the dirty area of the car (trunk or bodywork), if incineration or burial of these is not possible on the property; and

r) disinfect the steering wheel of the vehicle before leaving the property.

If the team has not had contact with animals with clinical signs compatible with vesicular disease, they can go to other properties and at the end of the day go to COEZOO, change clothes and bathe.

On the other hand, if the team had contact with animals showing clinical signs of vesicular disease, they should proceed from the property directly to COEZOO, deliver the samples taken, change clothes and bathe, including respiratory airway asepsis (nose and throat), remaining for a minimum period, established by COEZOO coordination, without visiting other properties with animals susceptible to FMD.

- For vehicles used:

Vehicles must have all rubber mats in good condition inside and the trunk must be lined with a sturdy plastic for easy cleaning.

At the end of the day of activities, in an appropriate place of the COEZOO, the steering wheel, pedals, rubber floors and plastic of the trunk of the car must be disinfected.

ATTACHMENT 02 – Criteria used for decision to use protection or emergency vaccination

This Attachment is based on Directive 2003/85/EC of the Council of the EU of 29 September 2003, which deals with Community measures to combat FMD, emergency vaccination may be used when at least one of the following conditions is met (item 1, Art. 50°):

a) outbreaks of FMD, which threaten to become widely spread, in the Member States in which they have been confirmed;
b) there are risks for other Member States due to the geographical situation of FMD outbreaks declared in a Member State, or the prevailing weather conditions;
c) there are risks for other Member States due to epidemiologically significant contacts between farms in their territories and holdings holding animals of susceptible species located in a Member State where FMD outbreaks exist; or
d) there are risks for certain Member States due to the geographical situation or weather conditions prevailing in a neighboring third country where outbreaks of FMD exist.

In addition to the above points, the use of emergency vaccination is considered favorable when (Table below in this Attachment):

a) there is acceptance of regionalisation by third countries;
b) economic evaluation of competing fighting strategies indicates that a strategy of fighting without emergency vaccination would lead to much higher economic losses in the agricultural and non-agricultural sectors;
c) it is foreseeable that the 24/48 hour rule cannot be implemented for two consecutive days;
d) social and psychological impact is considered relevant in the adoption of a generalized health slaughter policy; and
e) the region involved represents an area of low livestock density where large farms of intensive livestock production predominate.

Note.: the 24/48 hour rule means:

- infected animals in outbreaks may not be slaughtered within 24 hours of confirmation of the disease, and
- preventive slaughter of animals likely to be infected or contaminated cannot be carried out safely in less than 48 hours

The EU also provides for the use of protective vaccination, understood as emergency vaccination on farms in a designated area, in order to protect animals of susceptible species in that area, intended to be kept alive after vaccination, against the spread, through air or contaminated material, of FMD virus. The criteria considered in the evaluation of the use of protective vaccination are summarized in the table below:

Criteria	Decision	
	In favor of vaccination	Against vaccination
Population density of susceptible animals	High	Low
Clinically affected main species	Pigs	Ruminants
Movements of potentially infected animals or products outside the protection zone	Proven	Non-proven
Probability of spreading airborne virus from infected farms	High	Low or null
Adequate vaccine	Available	Unavailable
Origin of outbreaks (traceability)	Unknown	Known
Outbreaks incidence curve	Increasing rapidly	Little sharply or slowly increases
Distribution of outbreaks	Disseminated	Circumscribed
Public reaction to a policy of total health slaughter	Strong	Weak
Acceptance of regionalization after vaccination	Sim	No

ATTACHMENT 03 – DSA Circular Letter Office Template, reporting the occurrence of FMD

Circular Office DSA No. ____ Brasília, __ _____ _____

To Agricultural Defense Divisions and Sections (all)
c/c to superintendents

To the Board of Directors of State Agricultural Defense Agencies (all)

Subject: communication of occurrence of foot-and-mouth disease and definition of animal health sanitary emergency area

Sirs,

We report the occurrence of foot-and-mouth disease in the municipality of [inform the name], located in the UF [inform the name], and inform that animal health actions are underway aimed at the containment and elimination of the focus.

Considering the need to avoid the spread of the viral agent to other areas of the P there, the region [inform the list of municipalities or part of municipalities that will initially constitute the area of health risk] was defined as an area of emergency animal health, from where it is forbidden the exit of animals and products at risk for FMD. The area mentioned may be changed according to the evolution of the epidemiological investigations in progress and after evaluation of this Department.

We request immediate adoption of epidemiological surveillance actions required for the case, with emphasis on those related to the inspection of rural properties related to the area of animal health emergency by animal transit of animals from the last 30 days.

Best regards

Director of Animal Health Department

ATTACHMENT 04 – Draft of Ministerial Ordinance for declaration of the state of emergency animal health

ORDIDNANCE Nº ___, __ _____ ____

The Ministry of State for AGRICULTURE, LIVESTOCK AND SUPPLY, in the use of the attributions conferred on him the art. 2°, of Decree No. 5,741 of March 30, 2006, and Art. 52 of Law No. 12,873 of October 24, 2013, in view of the provisions of Decree No. 8,133 of 28 October 28, 2013.

Whereas confirmation of the occurrence of foot-and-mouth disease in the national territory;

Whereas the need for the immediate application of specific measures for the containment and elimination of the viral agent, preventing its dissemination to other areas of Country;

Whereas the temporary nature of the measures being adopted and what is contained in Process N,_____ _____ decides:

Art. 1º Declare a state of emergency animal health in view of on the occurrence of foot-and-mouth disease, for a period of 12 months, counted from this date, and to define as the affected area the region identified below::

I. _____

Single paragraph: the area of animal health emergency established in this article maybe amended, by normative act of the Secretariat of Agricultural Defense, according to the evolution of epidemiological investigations and animal health animal surveillance work in execution.

Art. 2nd Declare prohibited all rural properties and other establishments with animals susceptible to foot-and-mouth disease and other products that pose a risk for the maintenance or spread of the disease, located in the area of animal health emergency, from where it is forbidden the release of animals and other products at risk for foot-and-mouth disease.

Single paragraph. The movement of animals and risk products within the animal health emergency area should be governed by standards and procedures established by the technical team established to perform field operations, aiming at the containment and elimination of the viral agent.

Art. 3rd. This Ordinance shall enter into force on the date of its publication.

MINISTER OF STATE FOR AGRICULTURE, LIVESTOCK AND FOOD SUPPLY

ATTACHMENT 05 – Draft of Ministerial Notice informing about the occurrence of FMD in the country

Notice n· _____

Brasília, __ _____ _____.

To His (Her) Excellence Mr. (Mrs.)
[Name]
[position]

Subject: **occurrence of foot-and-mouth disease in the national territory.**

Mr. (Mrs.) Ministry,

I inform His (Her) Excellence of the occurrence of foot-and-mouth disease [indicate the place of focus], as described in the attached Technical Note. This episode represents a strong impact for national agriculture and immediate measures must be taken to mitigate socioeconomic consequences and restore normality.

That said, I ask for your support for the implementation of the measures necessary to deal with said animal health occurrence.

Yours truly,

[signer's name]
Ministry of Agriculture, Livestock and Food Supply

ATTACHMENT 06 – Draft of SDA Ordinance for the designation of professionals to coordinate COEZOO

ORDINANCE N. ___, _ ____

The SECRETARY OF DEFENSE OF AGRICULTURE AND LIVESTOCK , of the MINISTRY OF AGRICULTURE, LIVESTOCK AND SUPPLY, in the use of the attributions conferred on him by Art. 103 Item IV, of Ministerial Decree No. 45 of March 22, 2007, the provisions of Decree No. 5,741 of March 30, 2006, in Decree No. 24,548 of July 3, 1934, in Normative Instruction No. 44 of October 2, 2007, and

Whereas the need for immediate application of specific measures to contain and eliminate the viral agent, preventing its dissemination to other areas of Country.

Whereas the temporary nature of the measures being adopted and what is contained in Process #_____
_____

Art. 1st Name servers _____
_____veterinarian, CRMV *(UF)*-_____,and _____
_____
_____
_____ as General Coordinators of the field operations necessary for the containment and elimination of the viral agent.

§ 1. These servers shall be subordinated to the Director of the DSA, with the following responsibilities, limited to the animal health **emergency** area:

I. implement and coordinate the implementation of the guidelines of the National Surveillance Program of Foot-and-Mouth Disease, related to action in outbreaks of foot-and-mouth disease.

II. act in close harmony and articulation with the health authorities in the State concerned, which must be constantly notified and updated on all actions in progress.

III. to constitute, with the support of the health authorities in the State(s) involved, the complementary team for the coordination and execution of field actions.

IV. define the geographical boundaries of the animal health **emergency** area, keeping them updated according to the evolution of ongoing epidemiological investigations.

§ 2. Until appointment and relocation to animal health emergency area of the servers concerning this article, the responsibility for initial and immediate deployment of field operations should be shared by the heads of veterinary services in the SFA and the **State Veterinary Service** or representatives indicated by them.

§ 3. The appointed employees must work in the animal health **emergency area** alternately, according to a work schedule that does not impair the continuity of field actions.

Art. 4th. This Ordinance shall enter into force on the date of its publication.

SECRETARY OF AGRICULTURE AND LIVESTOCK DEFENSE

ATTACHMENT 07 – Ordinance template for the establishment of evaluation committees

ORDINANCE N. __ OF __ _____ 20__

IT IS AN EVALUATION COMMITTEE OF THE ANIMAL HEALTH EMERGENCY GROUP DUE TO A OUTBREAK OF FMD REGISTERED IN THE STATE OF_____

The Federal Superintendent of Agriculture, Livestock and Supply in the State OF .....;

Considering Law N.º 569, of 12/21/1948, as amended by Law N. 11.515, of 8/28/2007, and regulated by Decree N.º 27.932 of 3/28/1950;

Considering the occurrence of FMD in the municipality of ....., State ....., with positive laboratory diagnosis issued by the official network of the Ministry of Agriculture, Livestock and Supply - MAPA;

Considering the declaration of emergency animal health by the MINISTER OF STATE OF AGRICULTURE, LIVESTOCK AND SUPPLY through Ordinance nº __, of _____ of 20___

DECIDES:

Art. 1st Form the **EVALUATION COMMITTEE of** the animals that will be subjected to sanitary euthanasia, and the destroyed goods with view and elimination of the viral agent, naming the following representatives:

I - Representative of the Official Veterinary Service of the federal government;

II - Representative of the state government; and

III - Representative of the private sector.

Art. 2º The head of the evaluation committee shall be under the responsibility of the representative of the Official Veterinary Service of the federal government.

Art. 4º This ordinance shall enter into force on the date of its publication

Federal Superintendent

ATTACHMENT 08 – Animal Assessment Registry Template

EVALUATION RECORD

Number	**UF:**	**Date:**	**FORM-IN:**

Legal Basis:

ANIMAL(S) EVALUATED

Identification	Species	Breed	Gender	Age	Weight	Value (R$)
					TOTAL	

OWNER IDENTIFICATION

Name of the owner:		
Nationality:	Marital status:	*Occupation:*
ID:	Issued by:	CPF:
Address:		
Municipality:	UF:	CEP:

PROPERTY IDENTIFICATION

Name of the Property:	
Code at UVL:	Location:
Municipality:	*UF:*

COMISSÃO DE AVALIAÇÃO E SACRIFÍCIO

Name:		Signature:
Agency:	ID:	
Name:		Signature:
Agency:	ID:	
Name:		Signature:
Agency:	ID:	

OWNER OR GUARDIAN

Name:		Signature:
ID:	Issued by:	

ATTACHMENT 09 – Template of Registry of Evaluation of items and premises

Number:	**UF:**	**Date:**	**FORM-IN:**

Legal basis: (do not forget to mention sources of reference)

DESCRIPTION OF ITEM(S) OR PROPERTY (IES) EVALUATED

Description	Amount (R$) evaluated (A)	Amount (R$) discounted (B)[1]	Amount (R$) to be indemnified (A-B)
TOTAL			

[1] A discount will be made in the evaluation when part of the condemned items or buildings is judged under conditions of use - Article 1 § Sigle Paragraph Law 569/1948".

OWNER IDENTIFICATION

Name of the Owner:		
Nationality:	*Marital Status:*	*Occupation:*
ID:	*Issued by:*	CPF:
Address:		
Municipality:	*UF:*	*ZIP Code:*

PROPERTY IDENTIFICATION

Name of Property:		
Code with UVL:	Location:	
Municipality:		*UF:*

COMMISSION IN CHARGE

Name:		Signature:
Agency:	ID:	
Name:		Signature:
Agency:	ID:	
Name:		Signature:
Agency:	ID:	

OWNER OR GUARDIAN

Name:		Signature:
ID:	Issued by:	

ATTACHMENT 10 – Template of Registry of Animal Health Slaughter

REGISTRY OF ANIMAL HEALTH SLAUGHTER

Number:	**UF:**	**Date:**	**FORM-IN:**

Legal basis:

LIST OF SLAUGHTERED ANIMAL(S)

Identification	Species	Breed	Gender	Age	Weight

OWNER IDENTIFICATION

Name of the owner:		
Nationality:	Marital Status:	Occupation:
ID:	Issued by:	CPF:
Address:		
Municipality:	UF:	ZIP Code:

PROPERTY IDENTIFICATION

Name of the Property:	
Code:	Location:
Municipality:	UF:

RESPONSIBLE AGENTS FOR THE EUTHANASIA:

Name:		Signature:
Agency:	ID:	
Name:		Signature:
Agency:	ID:	

WITNESSES:

Name:		Signature:
ID:	Issued by:	
Name:		Signature:
ID:	Issued by:	

OWNER OR GUARDIAN

Name:		Signature:
ID:	Issued by:	

ATTACHMENT 11 – Template for registry of destruction of items and properties

Number:	**UF:**	**Date:**	**FORM-IN:**

Legal basis:

DESCRIPTION OF ITEM(S) OR PROPERTY(IES) EVALUATED

Description

OWNER IDENTIFICATION

Owner name:		
Nationality:	*Marital status:*	*Occupation:*
ID:	*Issued by:*	CPF:
Address:		
Municipality:	*UF:*	*ZIP Code:*

PROPERTY IDENTIFICATION

Name of the property:	
Code with UVL:	Location:
Municipality:	*UF:*

RESPONSIBLE COMMISSION

Name:		Signature:
Agency:	ID:	
Name:		Signature:
Agency:	ID:	
Name:		Signature:
Agency:	ID:	

OWNER OR GUARDIAN

Name:		Signature:
ID:	Issued by:	

ATTACHMENT 12 – List of disinfectants for FMD

(adapted in the "*Manual of Procedures for The Attention to Occurrences of FMD and other Vesicular Diseases*" of Panaftosa)

1. Citric acid at 2%
Preparation: two parts citric acid for 98 parts water.
Indications: laboratory objects and vehicle cabins.
Note: It is not very corrosive to metals and painted surfaces.

2. Sodium carbonate solution at 4%
Preparation: dissolve 400 g of sodium carbonate in water.10 liters
Contact time: 10 minutes.
Method of application: spraying, sprinkling, footbath and immersion.
Caution: When applying the disinfectant indoors, boots, gloves and mask are recommended.
Limitation: acts only in solution.
Indications: premises, persons and animals, vehicles, clothing, utensils, leathers, hides, bones, hay and straw.

3. Formaldehyde solution at 10%
Preparation: dissolve 1/2 liter of commercial formalin (40% commercial formaldehyde solution) in five liters of water.
Contact time: 30 minutes to 3 hours.
Application method: spraying, sprinkling and immersion.
Indications: clothing, utensils, leather, bone, hay and straw.
Caution: wear mask. When using formaldehyde gas to fumigate a room or building, the place should be reasonably closed. There is a need for 500 g of potassium permanganate and formalin (40% formaldehyde solution) for every 30 m³ of space. The permanganate is placed in an open container (like a can) and the formalin is added immediately before closing the site. In each container you cannot put more than formalin. The container must be made of metal (not glass or plastic, as it generates a lot of heat) and should be placed in another larger container, also metal. The gas should act as long as possible – never less than 10 hours. The reaction is enough to produce fire. The external metal container must be three times taller than the inner container and be more than 0.50 m away from any flammable material. On wooden floors, containers are placed on a tile or metal guard. Hazard warnings should be placed on the doors of the sites.

4. 2% sodium hydroxide solution (caustic soda)
Preparation: dissolve 200 g sodium hydroxide in water10 litros.
Contact time: 30 minutes.
Method of application: sprinkling.
Caution: wearing boots and gloves.
Limitation: very corrosive.
Indications: installations, manure reception pit and fences.

5. Iodophor compounds.
Preparation: mix the product in water.1 litro200 litros
Contact time: 10 minutes.
Method of application: spraying, sprinkling, stopm and immersion.
Indications: people, animals, vehicles, clothing, utensils, leather, skin, bone, hay, straw and manure reception pit.

It should be noted that in the episodes of animal health emergency, for elimination of outbreaks of FMD conducted in Brazil between 1997 and 2005, the products elected for the different applications were based on Iodophor. They are products of easy acquisition, conservation and use, and can be used both as disinfectants and as antiseptics, changing only the concentration / dilution, according to the recommendations of manufacturers. Newer products contain detergents that increase the penetrating power of the chemical agent, even in the presence of organic material, and substances that decrease the

corrosive action present in most available disinfectants. In the absence of detergents in the disinfectant composition, an alternative to improve its action against organic matter is the mixture of household detergent, in proportion to each of the disinfectant.

6. Acetic acid at 2%
Preparation: 2 parts glacial acetic acid for 98 parts water.
Indications: laboratory objects and vehicle cab.
Note: it is not very corrosive to metal objects but has little action on organic matter.

7. Metassilicate at 4%
Preparation: Four parts of metassilicate for 96 parts of water.
Indications: Acts on the denaturation of the protein and its oxidizing activity is lower than that of a comparable concentration of sodium hydroxide. It is not corrosive and irritating like sodium hydroxide. It is usually used in combination with other disinfectants.

8. Calcium oxide solution at 5% (burnt lime)
Preparation: dissolve 500 g of calcium oxide in water.10 litros
Contact time: from six to 24 hours.
Method of application: sprinkling, whitewashing.
Caution: use boots and gloves.
Limitation: it is recommended to use it immediately after preparation.
Indications: installations, vehicles, manure reception pit, wall and pole. Recommended to apply after burial of animals, above the ditch and never inside it.

9. Commercial creolin solutiona 10%
Preparation: mix nine liters of water with one liter of commercial creolin at 10%.
Contact time: two hours.
Method of application: spraying, sprinkling.
Indications: facilities, vehicles and manure reception pit.

10. Triple salt solution of potassium monopersulfate
Preparation: dilute the powder in running water, one part in 1,300 parts for FMD virus.
Contact time: 30 minutes.
Method of application: spraying, dripping and immersion.
Caution: it is neither toxic nor irritating.
Indications: disinfection of stables, corrals, industrial processing plants, surface of members and paws of animals, vehicles and equipment of farms.
Limitations of use: do not mix with alkaline substances, as the product works a pH of 2.5 for a solution at 1%. Once prepared, the solution remains active for approximately seven days.

Notes:

- The effectiveness of citric acid or sodium carbonate solutions improves with the addition of a small amount of an appropriate detergent. In every five liters of water, you can add up to one tablespoon of a liquid homemade detergent to wash. You can also add a teaspoon spoon and a half of a non-ionic detergent to citric acid solution.
- The viricide action of acid or alkaline disinfectants depends on the concentration of hydrogen ion (pH) in the recommended aqueous dilutions. Citric acid and sodium carbonate solutions, prepared as mentioned, should present pH < 4 and > 10, respectively.
- A simple method to determine the concentration of hydrogen ion is to measure the pH with indicator paper: wet a piece of indicator paper tape into the disinfectant and deposit it on a white, non-absorbent surface; after 30 seconds, compare its color to those shown on the packaging scale. These pH checks should be done randomly during disinfection operations. It is recommended that employees have four sets of tapes for pH (two for the pH scale 4 and two for the scale of 8 to 10).
- As the effectiveness of acids and alkalis as viricides depends on their pH, it is important that they do not mix. Surfaces treated with one type should not be subjected to the action of another unless a wash with water is interspersed. Never use washing soda and an acid to disinfect the same item.
- Disinfectants recommended for FMD are not effective against many pathogen bacteria and viruses and may lose their specific efficacy if mixed or applied together with general purpose disinfectants.

ATTACHMENT 13 – Disinfection procedures in cases of FMD

(adapted from *the Manual of Procedures for The Attention to Occurrences of FMD and other Vesicular Diseases* of Panaftosa)

It is not possible to lay down definitive rules to cover all the points that, in terms of disinfection, may arise during an outbreak. It is necessary to act with discretion in the treatment of all problems that may arise.

The disinfection procedure depends, in each case, on a variety of circumstances, such as the structure of the stables or pigsties, the places to which sick or suspicious animals have had access, the quantity of manure and other impurities, the nature of the products which are considered contaminated etc.

The most important factor to ensure inactivation of a causal agent in an infected property is in thorough cleaning and washing before applying a disinfectant.

It should be considered that virtually all substances used in disinfections are toxic to a greater or lesser extent. Therefore, the institutions involved should take appropriate measures to protect the health of workers working in the disinfection operation.

It is recommended to use gloves, boots and special clothes, as well as gas masks, when working with substances that produce vapors. At the end of the work, it is recommended to wash hands, face and exposed surfaces with soap and water. The clothes used in this work must be changed. It is important to always keep a first aid kit next to the disinfection equipment, in which there should always be products such as boric acid, phenolic acid, ointments or lotions against burns and others (gauze, cotton, iodine, etc.).

Another precaution refers to *the modus operandi.* Disinfection should always be carried out in favor of the wind, i.e. the operator must place himself in such a way that the air circulates from the back forward, in order to prevent the force of the wind from propelling against him the solutions used in disinfection.

Below, there are some specific recommendations highlighted for certain objects and places to be cleaned and disinfected:

- **Livestock buildings and facilities**

  As a preliminary measure – and before removing manure or other material from the building or premises – the site and neighboring land should be somewhat soaked with an approved disinfectant.

  All parts of the buildings and facilities that may have received contact with animals or their excretions will be very well scraped and brushed.

  Manure, loose bed, fodder should be removed and, if the amount is small, should be buried or piled, moistened with a disinfectant. If the quantity is too large, it must be accumulated in a place to which people or animals do not have access and the surface should be very well moistened, to avoid dispersion by the wind. If this is not possible, it can be taken to arable land, conveniently situated, where it is buried immediately. For this purpose, there should be no movement by public paths. Another alternative, if there is slaughter and burial of animals, is to reserve a space in the ditch of the animals to place the material removed from the corrals and other places.

  When the floor of buildings is of earth, clay or chalk, or permeable to water, the surface should be removed and moistened carefully with a disinfectant.

  Any wooden structure capable of retaining virulent material, which does not allow sufficiently effective disinfection, should be removed and burned. If it is not possible to disinfect wooden floors, these should also be removed and burned, and the subsoil turned to a depth of 30 cm and mixed with lime25 cm.

The possibility of the disease being spread by watercourses passing or ending in paddocks with susceptible animals should be checked. Sewage pipes should be closed as long as there is a risk of spreading the disease and the material should be disinfected before extraction.

Excrement liquids or draining from stables, corrals or other establishments with susceptible animals should be mixed with sodium carbonate until a solution of approximately 4% is obtained. This mixture should be well stirred and removed after at least five hours.

The destruction of any part or object of the property must be previously communicated to the owner in writing and agreed the amount of the indemnification. All unnecessary destruction should be avoided.

Insects and rodents can serve as mechanical vectors. When cleaning and disinfection operations are initiated, rodents migrate to other buildings. A prior review should be made to determine the need to control insects and rodents.

- **Corrals and other places**

Walls, fences and other surfaces should initially be washed with a disinfectant, then scraped and brushed, and washed again. The area with manor should be very well soaked with a disinfectant advised for the case.

If the manding cover is thick, able to heat up without needing to be piled up, it can remain in place. Otherwise, it should be removed from the sides to the center of the yard and accumulated, and then covered with 4% sodium carbonate solution.

As far as is reasonably practical, disinfection should be carried out with 4% sodium carbonate solution, e.g. in feeders, gates, paddocks and other places where sick animals have transited.

All areas that may have been in contact with killing operations should be carefully soothed with 4% sodium carbonate solution, for example.

- **Hay and straw bales**

Surfaces possibly exposed to contamination should be removed and destroyed. The rest should be mixed with 10% formaldehyde solution.

When it is suspected that large amounts of fodder have been exposed to contamination, and it is very difficult to subject them to washing or fumigation, the options for destruction, detention for safe time or direct conduct to a factory for manufacture should be evaluated. Special attention should be paid to hay stored on the upper floors of the stabless.

- **Tubers**

In the event of a risk of contamination, the deposits guarding tubers and the nearby floor should receive 10% formaldehyde solution and, if the deposits are open, also disinfect the exposed tubers. Tubers from contaminated places should be cleaned and mixed with 10% formaldehyde solution. Tubers that may have been with the infected animals are not allowed to leave the property.

- **Other food products**

According to the quantity, nature and possibility of contamination, they should be mixed or fumigated with formaldehyde. Small amounts of food can be eliminated, washed and eaten on the same properties to non-susceptible animals (birds, horses).

- **Bones**

Bones found in infected properties and intended for commercial purposes should be disinfected by washing with 10% formaldehyde solution or, if appropriate, by fumigation with formaldehyde, and sent directly to factories in closed and sealed trucks.

- **Hides and skins**

  Hides and skins can be removed from infected properties provided they are submerged in 4% hot sodium carbonate solution for 15 minutes, or in a 1 x 10,000 sodium difluoride solution for 24 hours.

- **Working animals**

  Horses of the compromised properties can work inside them or, if necessary, leave them after prior washing and disinfection of the paws.

- **Milk containers in the infected area**

  The method currently adopted in the dairy facilities and milk deposits to sterilize the containers is to place them in an inverted position and subject them to a steam spurt for one minute. The lid is left in boiling water at the same time. With this system, temperatures reaching the outside and bottom of the containers are not enough to destroy the FMD virus. Therefore, it is advisable to the owners and administrators of dairy or milk collector deposits that sterilize their containers, by immersion in boiling water, or that the interior is subjected to steam and the exterior, disinfected. The most convenient method of sterilization is by immersion in tanks with boiling water.

- **Contaminated wool**

  Disinfection with 2.5% formaldehyde solution for one hour at 38 to 40ºC, or for three hours at a temperature between 18 and 20°C.

- **Transport vehicles**

  Wash the entire agency with disinfectant; remove any manure and adhered dirt, scraping, brushing, watching edges and angles. Rewash the entire agency structure with the disinfectant. The steering wheel of vehicles must be carefully disinfected.

- **Boats and airplanes**

  A solution of 4% sodium carbonate with 0.05% sodium silicate is advised.

FEDERATIVE REPUBLIC OF BRAZIL
Ministry of Agriculture, Livestock and Food Supply
Secretariat for Agricultural Defense
Department of Animal Health

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