



FEDERATIVE REPUBLIC OF BRAZIL
Ministry of Agriculture and Livestock
Secretariat of Animal and Plant Health
Department of Animal Health

Contingency Plan for Zoonitary Emergencies

- Tactical and operational levels -

Declaration and Management of Zoonitary Emergency

**National System for Managing Agricultural and Livestock Emergencies
- SINEAGRO -**

**Brazilian System for Veterinary Surveillance and Emergencies
- SISBRAVET -**

Specific Part

Highly pathogenic Avian Influenza and Newcastle Disease

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TABLE OF CONTENTS

1. INTRODUCTION	6
2. TECHNICAL SPECIFICATIONS	7
3. PUBLICATIONS	8
4. LEGISLATION	9
5. BIOSECURITY	10
5.1. Personal Protection Equipment (PPE)	10
5.2. Guidance for reporting cases of influenza-like illness (SG) or severe acute respiratory syndrome (SARS) in persons exposed to probable or confirmed cases of HPAI in birds	11
6. HAZARDOUS PRODUCTS AND MATERIALS	12
7. SPECIFIC ACTIONS IN EPIDEMIOLOGICAL RISK AREAS	13
7.1. Outbreak	14
7.2. Outbreak Surrounding Area	14
7.3. Surveillance Area	15
7.4. Protection Area	16
8. DEPOPULATION	17
8.1. Stunning and depopulation methods for commercial poultry	17
8.2. Other animals and genetic material	19
8.2.1. Wild birds	19
8.2.2. Companion or ornamental birds	20
8.2.3. Backyard poultry	20
8.2.4. Water mammals	20
8.2.5. Embryonated eggs	20
9. DISPOSAL OF CARCASSES AND RESIDUES	21
9.1 Burial	21
9.2 Cremation	22
9.3 Composting of carcasses and organic materials	23
9.3.1 Materials used	24
9.3.2 Adequate place	24
9.3.3 Protocol for poultry composting	25
9.4. Other methods	28
10. DISINFECTION AND STANDSTILL	29
10.1. List of disinfectants for HPAI/NCD	29
11. SENTINELS AND REPOPULATION	33
12. VACCINES AND EMERGENCY VACCINATION	34
13. WILD ANIMALS	35
13.1. Wild birds	35
13.2. Other wild animals	37
14. CLOSURE AND RECOVERY OF THE ZOOSANITARY STATUS	38
15. APPENDIXES	39
APPENDIX 01 - GLOSSARY	39
APPENDIX 02 - ADDRESSES AND CONTACTS OF THE PLAN FOCUS POINTS	40

FIGURES AND IMAGES

Figure 01 - Division of the affected area into surrounding outbreak, surveillance and protection areas based on the outbreak	13
Figure 02 - Diagram of depopulation by injection of carbon dioxide (CO ₂) - floor plan	18
Figure 03 - Diagram of depopulation by injection of carbon dioxide (CO ₂) - front view (step 1)	18
Figure 04 - Diagram of depopulation by injection of carbon dioxide (CO ₂) - front view (steps 2 and 3)	18
Figure 05 - Diagram of depopulation by injection of carbon dioxide (CO ₂) - front view (step 4)	18
Figure 06 - Diagram of depopulation by injection of carbon dioxide (CO ₂) - top view (final)	19
Figure 07 - Diagram of depopulation by injection of carbon dioxide (CO ₂) - front view (final)	19
Figure 08 - Diagram of the construction of the trench and cover	21
Figure 09 - Landfill slope	22
Figure 10 - Diagram of the introduction of sentinel birds	33
Image 01 - Cremation in metal dumpsters	23
Image 03 - Open air cremation	23
Image 04 - Composting inside the shed	24
Image 05 - Composting in the area outside of the property	25

BOXES AND TABLES

Box 1 - Risk categories for AI/NCD and related products for transit control 12

Box 2 - List of disinfectants to be used to inactivate HPAI/NCD viruses

30

ACRONYMS AND ABBREVIATIONS

CETAS - Center for Wild Animal Screening CFMV -

Federal Veterinary Medicine Council

COEZOO - Operations Center for Zoosanitary Emergencies NCD -

Newcastle Disease

DSA - Department of Animal Health ESP

- Public Health Emergency

AI - Avian Influenza

HPAI - Highly Pathogenic Avian Influenza LPAI

Low Pathogenic Avian Influenza

IBAMA - Brazilian Institute for the Environment and Renewable Natural Resources

ICMBIO - Chico Mendes Institute for Biodiversity Preservation

MAPA - Ministry of Agriculture and Livestock

WOAH - World Organization for Animal Health

PESA - State Poultry Health Program PNSA -

National Poultry Health Program SDA - Secretariat

of Animal and Plant Health

FS - Flu-like syndrome

SARS - Severe Acute Respiratory Syndrome

ARNS - Avian Respiratory and Nervous Syndrome

SVO - Official Veterinary Service

1. INTRODUCTION

This Contingency Plan presents specific guidelines for the identification, containment and elimination of outbreaks of **highly pathogenic avian influenza** (HPAI) or **of Newcastle disease** (NCD), with the objective of restoring the health status of the country. Cases of **low pathogenic avian influenza** (LPAI) will be addressed in a document with specific guidance, not representing a zoonosanitary emergency.

It is a supplementary document to the **Contingency Plan for Zoonosanitary Emergencies - General Part**, containing information that must be widely known and mastered by the professionals engaged in the preparation and response actions to zoonosanitary emergencies.

2. DSA TECHNICAL SPECIFICATIONS

The DSA publishes technical data sheets of the main diseases under official control, with the most relevant information (epidemiological situation, agent, susceptible species, clinical signs and lesions, transmission, diagnosis, case definitions, sample collection, among others), available at https://sistemasweb.agricultura.gov.br/pages/fichas_tecnicas/ficha_tecnica.html

Find below the links to the technical data sheets of the two diseases addressed in this Plan:

- [AI Technical data sheet](#)
- [NCD Technical data sheet](#)

3. PUBLICATIONS

- [Chapter "Infección por los Virus de La Influenza Aviar de Alta Patogenicidad"](#)
- [Chapter "Infección por el virus de la enfermedad de Newcastle"](#)
- [Passive Surveillance of Avian Respiratory and Nervous Syndrome \(ARNS\)](#)
- [Manual for sample collection, storage and shipping](#)
- [Surveillance plan for Avian Influenza and Newcastle Disease](#)
- [Report on Areas of Concentration of Migratory Birds in Brazil 2022](#)

4. LEGISLATION

General legislation related to Zoosanitary Emergencies are described in the Contingency Plan for Zoosanitary Emergencies - General Part.

Specific legislation includes:

- [Normative Instruction SDA No. 32, of May 13, 2002](#) - Technical Standards for Surveillance, Control and Eradication of Newcastle Disease and Avian Influenza.
- [Normative Instruction no. 17, of April 7, 2006](#) – National Plan for the Prevention of Avian Influenza and the Control and Prevention of Newcastle Disease.

5. BIOSECURITY

5.1. Personal Protective Equipment (PPE)

Considering the zoonotic profile of avian influenza (AI) serotypes, the recommendations of the Ministry of Health and other public health agencies should be followed regarding the risk of exposure to the virus.

Likewise, **in addition to the biosecurity guidelines set forth in the Contingency Plan for Zoonitary Emergencies - General Part**, in the instructions of **Passive surveillance of Avian Respiratory and Nervous Syndrome** and in the **Newcastle Disease and Avian Influenza Surveillance Plan**, workers must use additional personal protective equipment (PPE), specific to the risk of infection by the virus:

1. Disposable overalls, preferably with a hood;
2. Double pair of disposable latex gloves;
3. High top rubber boots;
4. Protective masks - disposable particulate filtering respirator (PFF2 or higher) for dust, mist, fumes and low concentrations of acidic gases. Consisting of an internal supporting shell of non-woven fabric molded in synthetic fibers, a filtering medium composed of a layer of electrostatically treated microfibers and a layer of microfibers loaded with activated carbon, to retain acid gases. The outside of the respirator is comprised of a non-woven cover to protect the filter media. The mask must contain two elastic bands, a nose clip and an exhalation valve;
5. In circumstances of greater crowding or movement of infected animals and/or poorly ventilated environments, especially concerning the depopulation teams, the use of full face masks or respirators with a HEPA (High Efficiency Particulate Arrestance) is recommended;
6. Hood powered purifying respirator. Made of polypropylene-coated polyester, with a double flap that reaches the user's back and chest, having an elastic band for better fitting around user neck. Transparent front shield in glycol-modified polyethylene terephthalate with a semicircular shape. On the inside of the hood, there is a fastening system to the user head through a suspension, equipped with a sweat-absorbing strip and with simple fastening. Rear opening with quick coupling system for the trachea, in plastic material;
7. Goggles that seal well with the skin, with a flexible PVC structure to easily fit all the contours of the face, with uniform pressure, adjustable band so as not to come loose during activity, and with indirect ventilation to avoid fogging. It also must accommodate prescription glasses. Additionally, the lenses must be transparent plastic, anti-fog and scratch-resistant. The goggles may be reusable (provided that the necessary measures are taken for decontamination) or disposable.

5.2. Guidance for reporting cases of influenza-like illness (FS) or severe acute respiratory syndrome (SARS) in persons exposed to probable or confirmed cases of HPAI in birds

If the SVO identifies any probable or confirmed cases of avian influenza in birds in Brazil, it is recommended that people exposed to these animals be monitored, with the aim of early identification and timely notification of unusual transmission events at the human-animal interface.

Thus, it is essential that professionals and researchers who collect samples from wild birds be alert and watch for the appearance of symptoms of flu syndrome (FS) or severe acute respiratory syndrome (SARS) for 7 days after exposure to these animals. .

Given the suspicion or occurrence of a case of FS or SARS in persons who have been exposed to probable or confirmed cases of avian influenza, immediate notification to responsible health officials at the municipal, state and national levels is of utmost importance, as it may constitute a Public Health Emergency (ESP).

The means of immediate notification to the Ministry of Health are:

- Telephone: 0800-644-6645
- Email: notifica@saude.gov.br
- Website: <https://redcap.saude.gov.br/surveys/?s=LEP79JHW97> - Immediate Reporting Form for Diseases, Harm and Public Health Events

The following fields must be filled out:

- Description of the event: Disease, harm or immediate notification event
- Disease, harm or event to be notified: Influenza A (H5N1)

Timely notification will trigger the health officials responsible for surveillance and epidemiological and laboratory investigation of human cases and implementation of adequate prevention and control measures.

It should be noted that controlling the disease in animals is the first measure to reduce the risk for humans. Therefore, it is essential that animal and human surveillance act in constant communication, working in a coordinated matter and being mutually strengthened.

6. HAZARDOUS PRODUCTS AND MATERIALS

Products and materials that may contribute to the spread of a disease or infection and that require the enforcement of measures aimed at reducing the risk level.

Box 1 - Risk categories for AI/NCD and related products for the purposes of controlling transit.

Risk Category	Description of the product
<p>High risk</p>	<ul style="list-style-type: none"> • birds • products and by-products of any birds (meat, eggs, feathers, blood, viscera) • poultry genetic material • poultry production residue (bedding, manure, dead birds, discarded eggs, hatchery residues, among other organic residues)
<p>Medium risk</p>	<ul style="list-style-type: none"> • Non-susceptible animals; • insects and pests; • feed • Fomites in general that come into direct contact with susceptible animals • Vehicles providing services/transit between farms • agricultural products from outbreak areas or facilities near outbreak areas • people providing services/transit between farms • environmental management professionals and technicians and respective fomites
<p>Low risk</p>	<ul style="list-style-type: none"> • people not linked to farms • processed and packaged animal products • agricultural products not deriving from outbreak areas or facilities near outbreak areas • vehicles not connected to farms

7. SPECIFIC ACTIONS IN THE EPIDEMIOLOGICAL RISK AREAS

After the confirmation of a case of HPAI or NCD, zoosanitary emergency actions must be implemented in the epidemiological unit where the outbreak occurred and in the areas of epidemiological risk surrounding it (surround the outbreak, surveillance and protection).

The area surrounding the outbreak should be equal to 3 km around the outbreak, and the surveillance area 7 km from the area surrounding the outbreak, adding to a total of 10 km, which can be expanded or reduced, as determined by the epidemiological study of the region.

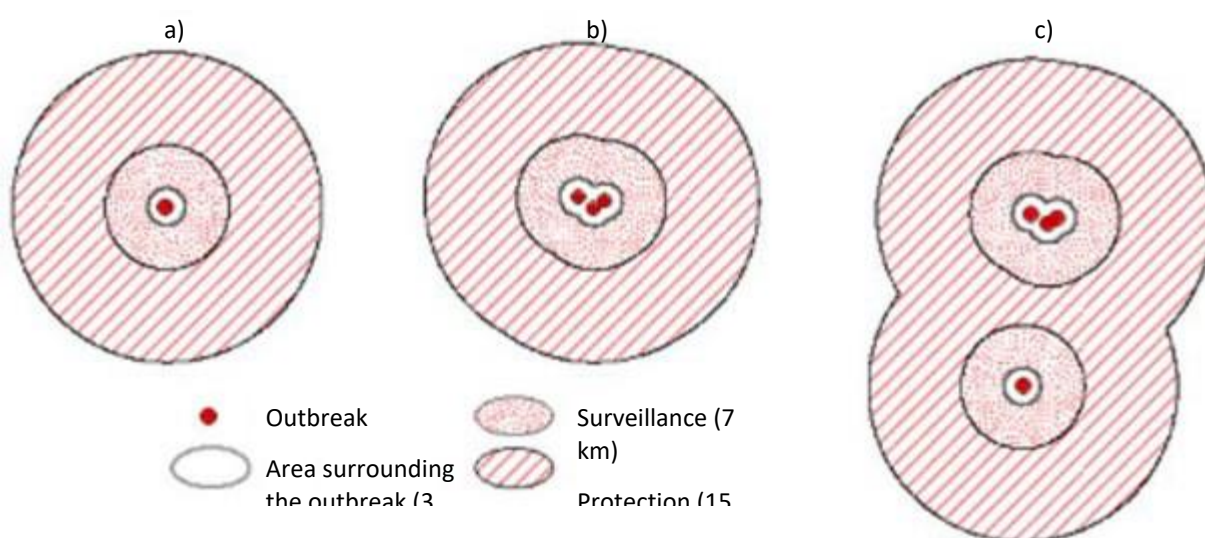
The protection area continues up to 15 km from the surveillance area, totaling 25 km.

The distances adopted here may vary according to geographic conditions, such as the existence of natural or artificial barriers, production characteristics, animal density, existing road network, existence of migratory bird routes, among others, as shown in the **Contingency Plan for Zoosanitary Emergencies - General Part**.

During clinical-epidemiological investigation actions in the different areas of epidemiological risk, the guidelines contained in the guidelines for **Passive Surveillance of Avian Respiratory and Nervous Syndrome**, in the **Sample collection, storage and submission manual** and in the **Avian Influenza and Newcastle Disease Surveillance Plan**.

Samples for diagnosis should only be taken from animals with clinical signs (when, therefore, a **probable case** is found).

Figure 1 - Division of the affected area into surrounding outbreak, surveillance and protection areas based on the outbreak



In the outbreak area, the following measures must be carried out:

- Immediate depopulation of all existing birds in the epidemiological unit, preferably on site, according to item 8;
- Destruction of all birds that have died in the outbreak, or that have been eliminated, as well as the meat of all

birds from the farm, eggs and by-products produced during the two periods of incubation of the disease, as set forth in the Terrestrial Code of the World Organization for Animal Health (WOAH);

- Cleaning and disinfection of the housing and access areas for birds on the property, according to Item 10;
- Any kinds of high-risk products and materials are prohibited from leaving the outbreak area, according to item 6. Any medium-risk products and materials are subject to prior authorization and conditions established by the Official Veterinary Service (SVO) to leave the outbreak area;
- Any type of susceptible animal existing on the property are prohibited from leaving and entering. For other non-susceptible animals, transit rules are at the discretion of the SVO.
- In the case of breeding flocks (pure lines, great-grandparent stock, grandparents and parents), in hatcheries that received eggs originating from the outbreak during the 28 days prior to confirmation of the case, all incubated and non-incubated eggs in the hatchery must be destroyed;
- Installation of a hand and boot washing area with a disinfection system and disinfectant at the recommended concentration (Item 10) at the entrance to the establishment. Vehicles must undergo cleaning and disinfection when leaving the establishment, respecting the acting time of the disinfectant;
- Whenever possible, avoid vehicle traffic on the access roads to the establishment (keep the technicians' vehicles as far as possible from contaminated or potentially contaminated areas and, whenever possible, in a position opposite to the winds that come from the establishment with infected birds);

The outbreak elimination team must use the PPE described in item 5 and respect the dressing and undressing procedures after each service, to avoid transferring the biological agent to other susceptible populations.

If all biosecurity procedures have been strictly followed, the team will observe a period of minimum standstill of **24 hours**, as set forth in the **Contingency Plan for Zoonosities Emergencies - General Part**, before any contact with healthy birds.

If any flaws in the procedures are found, this interval should be no less than **48 hours**.

The same applies to establishment employees and any third parties who have contact with materials and products considered high and medium risk (according to item 6).

7.2. Outbreak Surrounding Area

In the outbreak surrounding area, the following measures will be adopted:

- Investigating all properties with poultry, poultry establishments and places where birds are housed, every 3 days, with a record of all inspections and occurrences found. Preference should be given to establishments that maintained an epidemiological link with the outbreak during a period of time equal to twice the incubation period of the disease, counting back from the probable beginning of the sanitary event;
- Maintaining all birds in their housing or in another place that enables isolation, at the discretion of the SVO;
- The SVO bans holding of fairs, markets, exhibitions or gatherings of poultry of any kind;
- Using appropriate disinfection systems, according to SVO criteria, at the entrances and exits of the outbreak surrounding area;
- Movement control, within this area, of people, materials, equipment, vehicles and other animal species that pose a health risk;
- Banning movement and removal of birds, eggs, poultry litter, manure, feed, poultry by-products, and fomites from the property or the poultry establishment where they are located. Any movements must have express authorization from the SVO to the following destinations:

- a) Poultry for immediate slaughter in a slaughterhouse located in the emergency area or, if this is not possible, in one located outside it, when evaluated, according to the rules of the WOAHP Terrestrial Animal Health Code;
- b) Fertile eggs and their packaging must be additionally disinfected at the farm of origin, before transport, with the eggs sent to a hatchery within the emergency area, chosen by the SVO, with incubation carried out in exclusive machines. In case the hatchery is located outside the emergency area, fertile eggs and their packaging must be disinfected again at the destination, with incubation carried out in exclusive machines;
- c) Eggs for consumption must be sent to a cold store located in the emergency area or, if this is not possible, in one located outside it, when evaluated, according to conditions determined by the SVO.

The vehicles used must be cleaned and disinfected before and after use. The removal of poultry litter, manure, feed and poultry by-products is subject to prior authorization from the SVO. The measures applied in the outbreak surrounding area are implemented when the outbreak is confirmed and will be maintained until the conclusion phase of the outbreak.

7.3. Surveillance area

In the surveillance area, the following prevention and control measures must be adopted:

- Investigating all properties with poultry, poultry establishments and places where birds are housed, every 7 days, with a record of all inspections and occurrences found. Preference should be given to establishments that maintained an epidemiological link with the outbreak during a period of time equal to twice the incubation period of the disease, counting back from the probable beginning of the sanitary event;
 - Maintaining all birds in their housing or in another place that enables isolation, at the discretion of the SVO;
 - Banning movement and removal of birds from the property and the poultry establishment within the surveillance area, except those intended for sanitary slaughter in a slaughterhouse, located within the surveillance area or nearby, when evaluated and chosen by the SVO, by washing and disinfecting vehicles after transporting the birds;
 - Banning egg removal from the surveillance area, unless they are sent to a hatchery, evaluated and determined by the SVO, with incubation carried out in separate machines. These eggs and their packaging must be disinfected before being transported to the hatchery, the reuse of disposable packaging is prohibited;
 - Eggs for consumption must be sent to a cold store located in the emergency area or, if this is not possible, in one located outside it, when evaluated, according to the Terrestrial Animal Health Code of the WOAHP;
-
- The removal of manure, feed and poultry by-products is prohibited without authorization from the SVO.
 - The SVO bans holding of fairs, markets, exhibitions or gatherings of poultry of any kind;
 - Movement control, by the SVO, of people, materials, equipment, and vehicles that pose a risk of dissemination.

If required, the delivery of feed and movement of other vehicles should be analyzed with a view to organizing transport logistics for the region, with trucks and drivers exclusively for these functions. Disinfection sites must be created at the exit of the property, before arriving at the feed mill, and determine whether there are isolated feed loading areas inside the mill, or load at contrasting times than the other shipments. Vehicle access to properties must be restricted to service personnel or residents.

The measures applied in the surveillance area will be maintained until the conclusion phase of the outbreak.

7.4. Protection area

In the protection area, prevention and control measures will be established on a case-by-case basis by COEZOO.

8. DEPOPULATION

Before proceeding with depopulation, the animals, products, by-products and other destroyed goods must be assessed and taxed, as described in **Contingency Plan for Zoonitary Emergencies - General Part**.

The depopulation method should consider, whenever possible, the animal welfare, the safety of the people involved, biosecurity and environmental aspects. In addition, the criterion for choosing the depopulation method will depend on the species and the size of the affected population.

The activities should be started with the infected animals and then extended to the contact animals. In the case of detection of the HPAI virus in wild animals held captive, each case must be evaluated individually concerning the elimination of the contacts, considering the level of biosecurity of the place, species and threat category of the contacts, degree of isolation of the infected individual and detection of viral transmission between individuals in the same environment.

Any method that is unnecessarily gory or involves the spread of blood and potentially infectious fluids, such as decapitation or bleeding, should be avoided.

It is worth highlighting that the execution of procedures should be shared between the SVO and the private sector, with regard to human, material and financial resources, depending on the extent of the outbreaks, production characteristics, availability of public resources, among other factors.

Listed below are the depopulation methods approved by MAPA and contained in the WOAHP "Terrestrial Animal Health Code," in CRMV Resolution No. 1000, of May 11, 2012, and in the Appendix to the Normative Resolution CONCEA No. 37/2018.

8.1. Stunning and depopulation methods for commercial poultry;

- Mechanical methods: non-penetrating captive bolt (indicated for ratites);
- Electrical methods: electrocution 230V/50Hz
- Gaseous methods: injection of carbon dioxide (CO₂), or mixtures with nitrogen or inert gases (chemical hypoxia). It can be used in groups of birds piled up under a plastic tarp (Figure 2), closed box or container, or even placed in a reinforced plastic bag. Saturate the environment with a minimum concentration of 80% of CO₂. Outlet flow with an average of 35-30 l/min is recommended.

Figure 2 - Diagram of depopulation by injection of carbon dioxide (CO₂) - floor plan

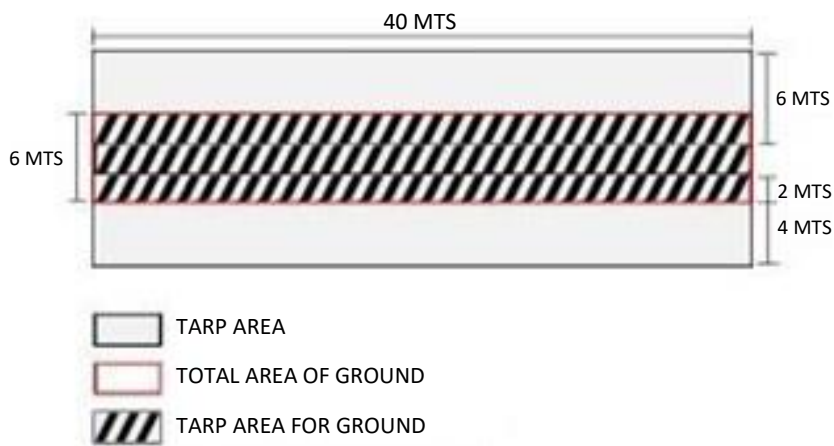


Figure 03 - Diagram of depopulation by injection of carbon dioxide (CO₂) - front view (step 1)



Figure 04 - Diagram of depopulation by injection of carbon dioxide (CO₂) - front view (steps 2 and 3)

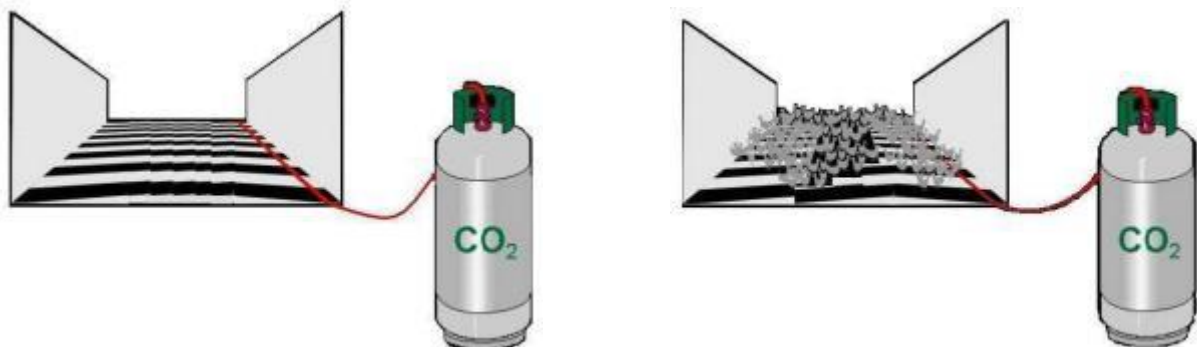


Figure 5 - Diagram of depopulation by injection of carbon dioxide (CO₂) - front view (step 4)

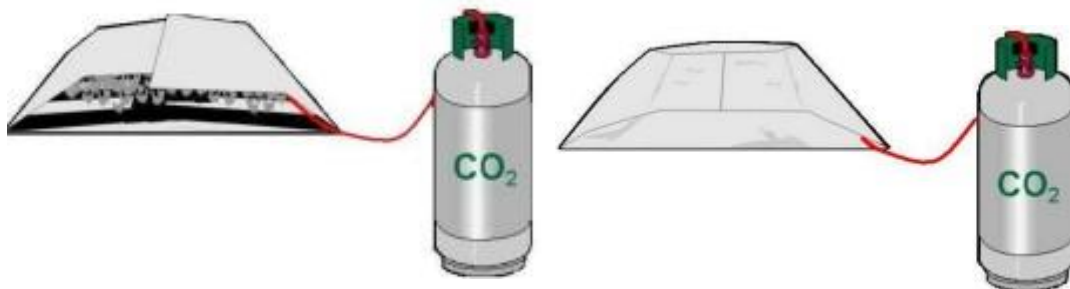


Figure 6 - Diagram of depopulation by injection of carbon dioxide (CO₂) - top view (final)



Figure 07 - Diagram of depopulation by injection of carbon dioxide (CO₂) - front view (final)



- Injection of barbiturates, addition of anesthetic to water, followed by one of the methods previously described.
- Foam application method (mechanical hypoxia).

If it is not possible to apply the previously described methods, the animals can be slaughtered by cervical dislocation.

If the methods described cannot be adopted, other methods may be adopted with authorization from MAPA.

8.2. Other animals and genetic material

8.2.1. Wild birds

The decision regarding the method to be used in wild birds must be shared with the corresponding environmental agencies. Injectable and inhaled general anesthetics, followed by another procedure to ensure death, are the methods of choice for the euthanasia of wild birds, ideally preceded by pre-anesthetic medication.

Acceptable methods include:

- Intravenous or intracoelomic injection of barbiturates (in exceptional cases when intravenous administration is impossible);
- Intravenous injection of general anesthetics (e.g. propofol);
- Application of inhalational anesthetics followed, when necessary, by other methods that ensure death;
- After the loss of the corneal reflex, the methods above can be supplemented by potassium chloride with or without a neuromuscular blocker, both intravenously;
- Cervical dislocation (only in birds up to 3 kg);
- Stunning by electronarcosis, followed by exsanguination or another method that ensures death;
- Chest compression (only in free-living birds weighing less than 50 grams).

8.2.2. Companion or ornamental birds

- Electrocutation;
- Gaseous methods: injection of a mixture of carbon dioxide (CO₂) with nitrogen or inert gases (chemical hypoxia). It can be used in groups of birds piled up under a plastic tarp or closed container, or even placed in a reinforced plastic bag. Saturate the environment with a minimum concentration of 80% of CO₂ for 30 minutes and wait 15 more minutes (Figure 2);

- Injection of barbiturates or other drugs that cause death;
- Cervical dislocation.

8.2.3. Backyard poultry

- Electrical methods: electrocution
- Gaseous methods: injection of a mixture of carbon dioxide (CO₂) with nitrogen or inert gases (chemical hypoxia). It can be used in groups of birds piled up under a plastic tarp or closed container, or even placed in a reinforced plastic bag. (Figure 2);
- Injection of barbiturates, addition of anesthetic to water, followed by one of the methods previously described;
- Cervical dislocation.

8.2.4. Aquatic mammals

- Injection of barbiturates or other general injectable anesthetics;
- T61 Hydrochloride Injection;
- Exsanguination, with prior general anesthesia;
- Use of firearms (animals) < 4 meters);
- Use of harpoon (animals) > 4 meters);
- Injection of opioids such as etorphine or carfentanil.

8.2.5. Embryonated eggs

For embryonated eggs of up to 14 days, cooling by submersion for 20 minutes is recommended, with subsequent maceration or decapitation. For embryonated eggs older than 15 days, CO₂, overdose of anesthetics, decapitation or maceration may be used.

9. ELIMINATION OF CARCASSES AND RESIDUES

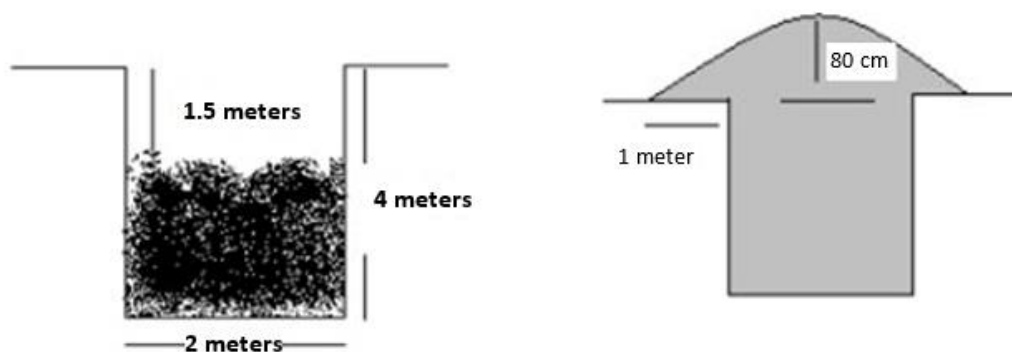
For disposal of carcasses and residues, and as decided by the Operations Center for Zoosanitary Emergency (COEZOO), one of the methods listed below must be adopted based on the geographic and production characteristics of the outbreak. Additionally, the responsible environmental agency must provide prior authorization.

9.1 Burial

One of the safest ways to destroy birds is to bury them within the perimeter of the property. Furthermore, the same place may be used to dispose of other materials along with the birds (poultry litter, feed, eggs, cardboard, among other materials). If the volume of the poultry litter does not allow burial with the birds, other trenches can be dug specifically for this purpose.

In making this decision, consideration should be given to the availability of an excavation site that does not compromise the water table. The places for burial should be as close as possible to the place where the dead birds are located, with easy access to transport the materials and far from sources and access to water and septic tanks, animals and people. There must be no underground plumbing in the area. The size of the trench must be planned according to the volume of material to be disposed of; a 4x2x2 m (16 m³) pit holds approximately 4,000 birds or 8,000 kg. The ideal is to excavate in the form of a ditch, where the carcasses will be disposed, which must not be buried inside plastic bags. The ditch must be covered with a layer of earth at least one meter high, until it reaches the ground level, adding 50 to 80 cm of earth above this level with a width greater than that of the trench, as shown in Figure 8.

Figure 08 - Diagram of the construction of the trench and cover.



As the decomposition of birds will cause swelling and cracks, the earth must be replaced, to prevent access by other animals and flies to the decomposing material. The cadavers and the earth that covers the trench must not be compacted, to avoid gas accumulation. The area should be isolated with fences or screens, which are buried in the ground at least 30 cm, in order to prevent animals from approaching and digging up the site. It is important to use have signage to identify the area.

9.2 Cremation

For incineration, a bed of combustible materials must be built, such as wood, and overlap carcasses on the bed.

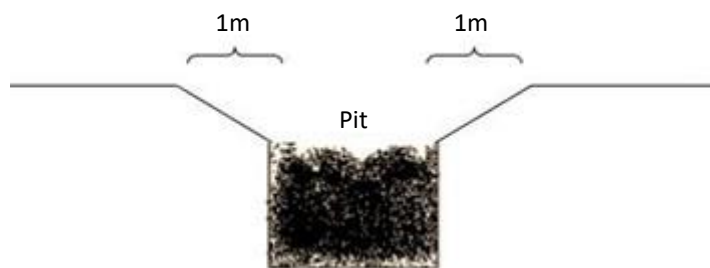
Among the advantages are the inactivation of pathogens resulting from combustion temperature and it can be carried out in the actual epidemiological unit, with no risk of dissemination during transport. However, the process is time consuming, difficult to operate and may reduce air quality.

Cremation can take place in an open-air ditch or in metal dumpsters specifically for this purpose. The specifications contained in this Plan refer to open cremation, the most common. For cremations in dumpsters, adaptations must be made, based on consultation with specialists.

The materials used in cremation are the carcasses of dead birds (and respective organic materials), combustible material and, in terms of machinery, excavators and backhoes. Combustible materials include firewood/thick wood, charcoal, small firewood/straw and diesel/kerosene.

For up to 25 tons of bird carcasses and their respective organic materials, the pit should be 1.0m deep by 3.0m wide and 50m long. Depending on soil conditions, it may be necessary to remove material from the sides of the pit, so that it doesn't cave in. For this purpose, the pit must be widened to 1.0 m as a slope (landfill slope), as shown in figure 9. You can use the slope to access the pit and add combustible material for every 2 m in length. If the slope is not created, a 70 cm wide transversal channel to interrupt the flow must be built, also every 2.0 m.

Figure 9 - Landfill slope



As a method of deposition of combustible material, a layer of firewood/thick wood should be placed at the bottom of the pit and, on top, the other materials soaked in flammable oil. Carcasses should be placed on top.

To calculate the amount of combustible material proportionally for the carcasses, approximately 6 tons of charcoal, 1/2 ton of firewood, 75 liters of diesel and 45 kg of straw or kindling are necessary to burn up to 25 tons of material to be destroyed (approximately 10,000 birds).

It is possible that more carcasses can be cremated with this basis of calculation for material, depending on the slaughter method used on the birds or how much chicken litter is mixed with the birds. For example, if foam is not used and all feathers are partially dry, the feathers themselves will function as combustion material, which can make the process even more efficient.

Image 01 - Cremation in metal dumpsters



Source: Gary Flory

Image 2 - Open air cremation



Source: Gary Flory

9.3 Composting of carcasses and organic materials

Composting for carcasses and organic materials from infected birds is done using windrows, comprised of infected biological material and a substrate such as wood shavings and rice husks. Composting is a biological process, with heat production by microbial activity in the windrows.

The compost windrow, when constructed correctly, will keep the center of the windrow in optimal conditions for AI and NCD virus inactivation. Raising and, mainly, maintaining the temperature of the material being composted between 50-70°C until the complete decomposition of the soft tissues of the carcasses is the main indication that the process was efficient. After reaching this plateau, gradual reduction of compost temperature is acceptable. Therefore, monitoring temperatures inside the windrows is necessary and indispensable for composting carcasses and organic materials from AI-infected birds.

For biosecurity reasons, preference should be given to building the windrows inside sheds, such as the actual poultry housing. If that is not possible, composting can be carried out outside.

All persons participating in the composting process must protect themselves by using PPE.

The protocol for composting, based on the Article Mortality Composting Protocol for Avian Influenza Infected Flocks (USDA, 2016), is detailed below:

9.3.1 Materials used

- Dead bird carcasses as a biological source;
- Bedding material (wood sawdust/shavings, rice straw, corn straw, seed husks, wood chips...) as a source of substrates;
- Machinery to handle the material in the windrows;
- Loader and truck (for initial and final handling of carcasses and bedding material);
- Thermometer;
- Water if the windrow gets too dry.

9.3.2 Adequate place

If the space in the poultry housing or barns on the property is adequate to move machinery on the inside, it should be preferred over the external sites.

Image 4 - Composting inside the housing



Source: Gary Flory

If the construction site for the composting windrows is external, care must be taken concerning the location within the property, in order to provide adequate access to machinery traffic. In order to guarantee biosecurity, windrows must be constructed:

- with wind direction moving against nearby residences;
- in well-drained soils (such as ideal soil used in agricultural production), avoiding plains that could lead to flooding;
- without river flows or the construction of ditches to divert them;
- at a minimum distance of 100 meters from bodies of water and wells, and 20 meters away from draining ditches

Image 5 - Composting in the area outside of the property



Source: Gary Flory

9.3.3 Protocol for poultry composting 25

- Assembling the windrow can be divided into three steps: 1- base, 2- core and 3- cover.
- Each of the windrows must be labelled to facilitate continuous monitoring.
- Poultry composting is divided into two cycles of 14 days each, totaling 28 days. After the first cycle, the material is turned over (turning).

9.3.3.1 Base

- A base layer of windrows should be made with dry substrate (material commonly used as poultry litter, such as wood shavings, rice straw, etc.)
- The base should be 30-40 cm high; 1.5 m to 5 m wide and up to 20 m long.

Neither the base layer nor the windrow should be compacted, to allow aeration and action of microorganisms inside the windrow.

Before composting, a 3.5 meter wide strip must be left free in the poultry house, where the windrow will be built. Then, the litter should be spread as the base, up to a height of 35 cm (this base will be naturally compressed with the placement of the core material).

The amount in kilograms or tons of substrate used in the base depends on the density of the material preferred by the farm and the size of production. There is approximately 60 cubic meters of substrate in each windrow built with the standard dimensions described.

If wood chips are used, they should not be bigger than two inches, so that there is no subsequent damage to being used as biocompost in the soil.

9.3.3.2 Core

The core of the windrow is comprised of carcasses (or other products from contaminated aviaries, such as eggs and feed) and poultry house litter. The windrow core must be uniformly mixed in advance, in a 1:1 ratio (volume) of carcass material and litter used. If necessary, add water to the core. In this step, grinding and macerating the

carcasses should be avoided.

The core should be added on top of the base layer and in the center of the windrow. A suitable way to do this step is with operators on both sides of the windrow, or machines with a wheel loader. The core can be added up to the standard height of 1.5 m (maximum 1.8 m).

On each side of the windrow there should be a 30 cm strip of litter material as a base. Furthermore, this base side strip must not be compacted by the machinery in operation.

9,332 Cover

The core should be entirely covered with the substrate, with 30cm of the material on top of the core.

The purpose of this step is to be sure that not carcasses will be exposed. The cover also prevents foul odor and flies. It is worth noting that a thicker cover may be applied. The material used in the cover may be thinner than the base material, however the thinner it is, the thicker the layer applied must be to prevent the core from being uncovered. Be sure that no carcass is exposed during the first 14 days.

9.3.4 Windrow monitoring

Monitoring refers to taking the temperature on a daily basis of the windrows at equidistant points, during the first 14 days, to guarantee a period of at least 72 hours in which the temperature is maintained between 50-60°C (with an ideal of 55°C).

A thermometer must be inserted for measurement at a height of $\frac{3}{4}$ of the windrow, at a 45 degree angle. The thermometer should preferably be inserted to a depth of 45cm to 90cm for every 2 meters of length. All measurements must be properly recorded for future audits. These procedures must be maintained

after material is turned for another 14 days. A dedicated composting soil thermometer with a long stem is recommended.

If in any part of the cycle the windrow remains at a temperature below 37.5°C or above 71°C for more than 3 days, a professional with experience in composting must be consulted to carry out the necessary corrections in order to certify the inactivation of viruses.

If the windrow is not achieving the adequate temperature, it may be too dry or too wet. In the first case, wetting the windrows is enough and, in the case, litter material must be added. If the temperature decreases more than it should, the windrow may be lacking oxygen; in that case, it must be aired.

9.3.5 Turning the windrows

Windrow turning can only be carried out after the first 14 days, if having the right temperatures.

Turning means to turn over all the material in the windrow (base, core and cover). That may be done with a skid steer loader, collecting the compost and mixing it as it is dumped into a new compost windrow pile. There is no hindrance from placing the windrow of the second cycle in exactly the same place as the one created in the first cycle

The windrow must be turned in order to maintain the porosity and adequate structure, without the presence of soft tissues on the surface of the windrow (if this occurs, apply another layer of litter material of 5 to 10 cm). The point of attention in this step is that dumping and mixing the material from the windrows must provide maximum aeration for the compost.

Windrows built inside the poultry house may be moved outside when turning. Specific machines that can be a "mechanical turner" may be used by coupling to the tractors. If in open sites, larger loaders obviously perform

this step faster and grant better aeration for the material.

9.3.6 Indicator summary

- First cycle: 14 days.
- Second cycle: 14 days.
- Minimum total time: 28 days.

If necessary, the SVO may recommend an additional 28 days for material maturation before being transported or used as biocompost.

Windrow dimensions:

- Base layer: 30-40 cm high (depending on the density of the material used)
- Base width: 1.5 m to 5 m (3.5 m as standard).
- Height, including the core: 0.8 m to 1.8 m (1.5 m as standard).
- Cover height: 25 to 40 cm (30 cm as standard).
- Total height: 1.0 m to 2.4 m (1.8 m as standard).
- Maximum length: 20 m.
- Distance between the windrows: enough to pass the machinery without its tires compressing the windrow.
- Time to first turn: 14 days
- Ideal core temperature of the windrow: 55°C for 72 hours (50-60°C acceptable).
- Ideal humidity: 50-60% (40-65% acceptable).

9.3.7 Documentation of processes on the farm

- Document the type, size, number and condition of materials to be used in composting (carcasses, litter material, eggs, feed and others).
- Document the daily temperature at different points in the windrows.
- Minimize air ventilation in closed composting and check air quality for ergonomic work by operators.
- Keep photos of the assembly of each step of windrow formation, the turning process and the final compost on file.

9.4. Other methods

If conditions exist in the region, methods of anaerobic digestion, dehydration followed by composting or sending to non-edible products (rendering plants) establishments may be used, by adopting appropriate biosecurity measures, according to MAPA assessment and authorization.

10. DISINFECTION AND STANDSTILL

After depopulation and disposal of carcasses and residue, the poultry house must undergo a disinfection process, to eliminate the virus present in the environment.

The equipment used in poultry houses, drinking fountains, feeders and others, must be disassembled, when possible, washed and immersed in a suitable disinfectant solution (Box 2), before use and afterwards.

Silos must be washed and disinfected, and the feed distribution system and hydraulic network must be dismantled, if possible, for thorough cleaning and disinfection. The poultry house must be rigorously washed and disinfected twice, with an adequate interval according to the technical specification of the disinfectant (Box 2).

In poultry houses with a plastic lining system, the plastic should preferably be replaced by a new one or be removed, washed and disinfected.

All facilities that have any functional or physical relationship with the place where the birds were housed must be rigorously washed and disinfected.

Cleaning and disinfection of the areas outside the poultry house must be carried out, within a radius of 20 meters from the facilities, by spraying with a suitable disinfectant, according to the list of products contained in this Plan.

For site disinfection, the area must be cleaned, residual organic matter must be removed and the surface scrubbed with water and detergent, rinsing all detergent and organic material from the surface. After cleaning, the disinfectant will be applied to the surface, waiting for the necessary time for its action.

After thorough cleaning and disinfection of the site, the standstill step will begin. The area cannot be repopulated with new animals, before, at least, 30 days after the disinfection procedures have been concluded and only after authorized by the SVO. During this period, the epidemiological unit must be subject to special surveillance to ensure the absence of animals susceptible to HPAI/NCD. All epidemiological unit boundaries should be checked to assess the condition of fences. Possible attractants, such as feed remains, must be eliminated. Any irregularities must be corrected in order to prevent animals from neighboring farms from entering the area.

A vector control program (insects, rodents, birds) and insecticide application must be carried out to eliminate potential mechanical vectors, opting for a product that acts by contact and having residual power.

10.1. List of disinfectants for HPAI/NCD

Disinfectants must be used according to manufacturer recommendations regarding dilution, contact time, method of use and use of PPE.

Box 2 - List of disinfectants to be used to inactivate HPAI/NCD viruses.

MAIN ACTIVE INGREDIENT	PRESENTATION	CONCENTRATION/ DILUTION	CONTACT TIME	OBSERVATIONS
1 Potassium monopersulfate	Powder	Prepare the dilution, between 1:50 and 1:200, according to manufacturer instructions.	5 to 10 minutes on the surface, according to manufacturer instructions.	Disinfection of agriculture and livestock facilities and equipment. After dilution, the solution turns pink, indicating that the product is active. As long as the solution remains pink, the solution is active for five days.
2. Quaternary Ammonium and Glutaraldehyde	Transparent liquid	Prepare the dilution of 1:1000, according to manufacturer instructions.	15 minutes	Disinfection of agriculture and livestock facilities and equipment. Corrosion: Materials tested in which no corrosive effect was evident: mild steel, zinc, copper, brass, tin, stainless steel, aluminum, rubber. Materials to avoid: nylon, oxidizing agents.
3. Benzalkonium chloride and Glutaraldehyde	Colorless to light yellow solution	Prepare the dilution according to manufacturer instructions. Varies from 1:1000 to 1:2000.	Facilities and equipment	Disinfection and cleaning of facilities and equipment for raising poultry, pigs and other animals, slaughterhouses, utensils and equipment for food processing, disinfection of eggs and hatcheries, wheel and footwear-washing facilities, and transport vehicles.

4. Peracetic acid, hydrogen peroxide 15%	Solution	Fumigate according to manufacturer instructions: 25mL/m ³ of product solution at 30% (45,000ppm) Immersion: 0.15% (225ppm), 1.5mL/liter of solution	Fumigation: 20 minutes Immersion: 20 seconds	Used both for fumigation and for egg immersion.
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1. Potassium monopersulfate

Preparation: dissolve the powder in water to achieve the solution according to the manufacturer. As long as the solution remains pink, the solution will be active for up to five days. Contact time: 10 minutes until drying naturally. After contact time, rinse. Application method: spraying, spraying droplets and immersion. Indications: equipment in general for use in animal diet and desedimentation, barns, pens, stables, equipment and utensils, facilities for raising birds, transportation vehicles for animals, waterproof footwear. Use limitations: do not mix with alkaline substances, as the product works at a pH of 2.5 for a 1% solution.

2. Quaternary Ammonium and Glutaraldehyde

It has no corrosive action on equipment and buildings. Does not cause irritation at recommended dilution levels. The association of 5th generation Quaternary Ammonium (QA) and Glutaraldehyde expands the respective spectrum of each of the components to reach all target bacteria, fungi and viruses, even in the presence of organic matter.

Orthomyxovirus (H5N1, H6N1 and H1N1): 1:1000 dilution (0.10%);

Orthomyxovirus (H7N9): 1:500 dilution (0.20%);

Paramyxovirus (Newcastle disease): 1:1000 dilution (0.10%).

The surfaces to be disinfected must be previously washed. Prepare solution daily in the amount to be used. The product must be in contact for the parts to be disinfected, for at least 15 minutes.

3. Benzalkonium chloride and Glutaraldehyde

Form: solution. Color: colorless to light yellow. Odor: product-specific. pH: around 4.0. Disinfectant based on benzalkonium chloride (BC) and glutaraldehyde (G) for veterinary use.

Chemical or generic name of ingredients that contribute to the hazard: (BC) Alkyl dimethyl benzyl ammonium chloride; (G) 1,5-pentanediol. Concentration of ingredients that contribute to the hazard: (BC) Benzalkonium chloride, in the proportion of 7.5%; (G) Glutaraldehyde, in the proportion of 42.5%.

Indications: disinfection and cleaning of facilities and equipment for raising poultry, pigs and other animals, slaughterhouses, utensils and equipment for food processing, disinfection of eggs and hatcheries, wheel and footwear-washing facilities, and transport vehicles.

4. Peracetic Acid and Hydrogen Peroxide

Bactericidal, virucidal and fungicidal disinfectant based on Peracetic Acid. It is used in general disinfection of agroindustries and piping. Effective against spores, bacteria, viruses and fungi in just two minutes of contact.

11. SENTINELS AND REPOPULATION

After the standstill period is finished, and at the discretion of COEZOO, sentinel animals may be introduced into the epidemiological unit. The animals must come from target (HPAI/NCD) disease-free farms and before entering the epidemiological unit, the animals must be assessed for the presence of structural and non-structural antibodies against HPAI/NCD disease. Only seronegative and virologically negative animals with no indication of neurological and respiratory disease are to participate.

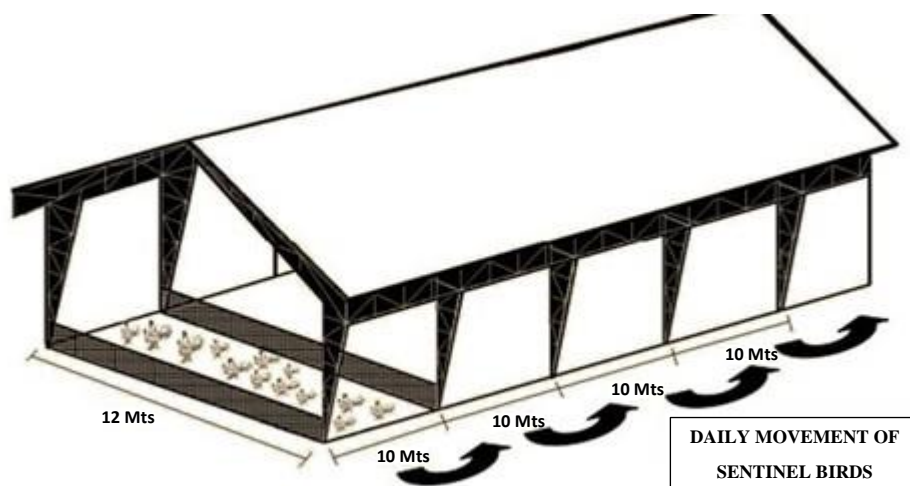
In addition to the health characteristics of sentinel animals, other important points must be considered: origin of the animals; individuals responsible for the costs of purchasing and treating animals; individuals responsible for transporting the animals; and the disposition of the animals after the end of the activities. The decision to use sentinel animals must be taken right from the start of the outbreak elimination procedures, so that there is enough time for the selection and preparation of the animals.

Clinical inspections must be performed daily on sentinel animals, with serological and virological control every 15 days, in an official laboratory or approved laboratory by MAPA for this purpose, up to a period of 30 days. Sentinel birds must be placed in a marked area of the housing(s), being moved to the other areas daily (Figure 10). The number of sentinel birds to be used must be equal to one bird for every 10m².

After a period of 30 days, if no signs of infection are found in the animals, the repopulation of the epidemiological unit may be allowed, at 20% of the housing capacity. These animals will be monitored for 60 days, with weekly inspections by the SVO, and at the end of the period the site will be allowed to repopulate completely.

If sentinel animals were not used, the repopulation may be done with a maximum of 20% of the housing capacity, at least 30 days after the disinfection procedures have been concluded. In this case, serological monitoring will be carried out on housed poultry, as well as virological screening, following the same sample collection scheme for laboratory analysis of sentinels, illustrated in Figure 10.

Figure 10 - Diagram of the introduction of sentinel birds



Sample collection (serological and virological) on days 15 and 30

12. VACCINES AND EMERGENCY VACCINATION

The Terrestrial Animal Health Code defines emergency vaccination as “(...) a vaccination programme applied in immediate response to an outbreak or increased risk of introduction or emergence of a disease.” The use of the avian influenza vaccine is prohibited in Brazil. However, in the event of an outbreak, and for its containment, the vaccine may be used in the areas surrounding the outbreak and surveillance areas, if necessary and upon analysis by the DSA/MAPA, and any guidance is under the power of the SVO, taking into account the following:

- The concentration of birds in the area affected;
- Characteristics and composition of the vaccine to be used;
- What will happen to vaccinated birds (vaccination for life/for death);
- Registration, acquisition and procedures for stocking, distribution and control of vaccine use; and
- Species and categories of birds that will undergo vaccination.

In this case, it is of paramount importance to constantly update the registration of poultry establishments, monitor vaccinated lots, establish traffic restrictions and control the slaughter of birds. Vaccination in the outbreak area will be maintained until laboratory confirmation of the end.

Control of vaccinated flocks must be carried out by placing non-vaccinated and marked sentinel birds next to the lot of vaccinated birds, performing serological and virological tests on the sentinels every 15 days. Any positive reaction will be submitted to confirm that it is not the field virus involved in the outbreak. For this, preference will be given to vaccines that can be set apart from field viruses, where DIVA technology is used: “Differentiating Infected from Vaccinated Animals.” If the presence of the field virus is found, all outbreak actions must be carried out in the place where the vaccinated flock is housed.

13. WILD ANIMALS

All actions involving wild animals must be handled together with the corresponding environmental agencies (ICMBio, IBAMA and state agencies).

When a case of HPAI/NCD is found, the actions to be taken by the SVO must be adapted when compared to the actions performed in outbreaks of domestic birds. First, there is no evidence of benefit in attempts to control the virus in wild animals through depopulation or habitat destruction. Instead, steps should be taken to increase surveillance and biosecurity. Active surveillance in wild animals can help to identify early potential spread of the virus in Brazilian wild fauna and potential transmission to domestic birds.

However, traditional active surveillance actions, designed to respond to outbreaks detected in domestic animals in rural areas, are not fully applied. The most effective thing is to intensify communication actions, aiming to increase biosecurity in properties with susceptible species and to sensitize the population in the area involved in the event, consequently identifying new probable cases of ARNS through passive surveillance.

The educational campaigns must be adapted to the characteristics of the region (urban, rural, mixed) and include alerts so that any citizen who identifies abnormal and unexplained mortality of wild animals (of any species), or the presence of dying animals, immediately notifies the SVO to ensure that an appropriate investigation is carried out. Interaction with the state and municipal departments of education, health and the environment, for involvement in communication actions, is essential at this step.

The 10 km radius (3 km from the outbreak surrounding area + 7 km from the surveillance area) can be used as a reference to establish the limits for this notification action, and the area may be increased or reduced according to the physical, environmental, production, social and economic characteristics surround the outbreak. In addition, the presence of establishments with birds located in this perimeter of the outbreak must be informed in the state database. Depending on the populational density and dynamics/history of the event, active surveillance directed at specific establishments may be necessary.

13.1. Wild birds

When there are migratory bird sites or native wild birds **inside the emergency area**, periodic epidemiological surveillance actions must be carried out by the SVO and, when abnormal and unexplained mortality of birds of any species is found, or the presence of dying birds with clinical signs compatible with avian influenza (eye discharge, eye swelling, difficulty breathing, lethargy, inability to stand up or walk, seizures, tremors, torticollis), samples must be collected for laboratory tests, recording all surveillance actions and occurrences found.

The decision of where to collect the samples for diagnosis and euthanasia of wild birds, must be made on a case by case basis. At this time, intersectoral articulation in public policies is important, whether at the federal, state or municipal levels, including the private sector, which have material and human resources for prompt employment (Urban Cleaning, Zoonoses Control Center, Civil Defense, Fire Department, Environmental Police, Municipal Guard, private funds, associations, universities, among other institutions). Intersectoral work, which requires articulation between agencies and people, is extremely important in the zoosanitary emergency, as it enables the participation of a large number of players in favor of the collective interest.

Animals with clinical signs must not be transported to animal rehabilitation centers, except when verified, in advance, that the center has an isolated area for receiving and screening the animals, with separate facilities

and far from the quarantine and rehabilitation areas of the resident population. Adoption of biosecurity measures aimed at reducing the spread of the agent, such as cleaning and disinfection, and the use of appropriate PPE are mandatory in screening areas.

The active search for recently dead or fallen wild birds must be increased, with sample collection. Moribund or clinically ill birds must be disposed of according to the guidelines in item 8. Places for burial or other method of disposal of carcasses and residues (cremation, composting) must be identified in agreement with the environmental authorities, according to the guidelines in item 9.

If material disposal is not feasible at the site where the dead birds are located, a container must be used to transport the carcasses to the place chosen for disposal, provided that it is hermetically sealed, with special attention to biosecurity measures.

The area and equipment used must be cleaned and disinfected, using the disinfectants listed in item 12 of this Plan and with authorization from the environmental agencies.

It is necessary to pay attention to the species most likely to lead to alerts for the presence of HPAI: stone-turners (*arena interpres*), white sandpiper (*calidris alba*), red-throated sandpiper (*Calidris canutus*), white-on-white curlew (*Calidris fuscicollis*), semipalmated sandpiper (*callidris pusilla*), peregrine falcon (*Falco peregrinus*), white shearwater (*fulmarus glacialis*), big miller (*stercorarius skua*), northern terns (*Sterna hirundo*), arctic terns (*Sterna paradise*), terns-royal (*thalasseus maximus*) and Sabine's Gull (*Xema sabini*). Among these species, some were affected in recent outbreaks of HPAI in the Northern Hemisphere and tend to migrate to Brazil, such as the northern tern, the semipalmated sandpiper, the white sandpiper, the red-throated sandpiper, the stone-turner and the peregrine falcon, among other birds.

Under ideal conditions, **outside the emergency area**, one should avoid going to wild bird flocking sites or seabird breeding sites, especially in countries/regions where HPAI outbreaks have been reported.

In situations where professionals must carry out field work in bird colonies, field equipment (scales, weighing bags and straps, tracking devices, clothes, boots, etc.) used in these activities must be completely disinfected before reuse.

Visiting several seabird colonies in a single field trip should be avoided. If this cannot be avoided, biosecurity precautions should be reinforced before moving between colonies.

Ideally, professionals should have a set of dedicated equipment (gauges, rulers, etc.) for different species or locations of seabirds, which must be properly labeled and stored separately.

Professionals who have had contact with wild birds cannot visit commercial poultry establishments or farms considered as "backyard" for at least **48 hours**, given that commercial poultry, as chickens and hens, are highly sensitive to HPAI.

Likewise, professionals who have had contact with commercial poultry establishments cannot maintain contact with water and sea birds or their reproduction or flocking sites for at least **48 hours**, after adequate cleaning and disinfection.

13.2. Other wild animals

The HPAI H5N1 variant has been identified as the cause of death of thousands of wild birds since the end of 2022 in several countries in South America. This outbreak led to a large amount of infectious material, which can be transmitted to predators and scavenger species. This was probably the initial route of infection for other wild animals that inhabit these same environments, resulting in an increasing number of cases in mammals, both terrestrial and water, causing morbidity and mortality in different species of felines, bears, foxes, coyotes, skunks, dolphins, seals, coatis and sea lions.

If other species of wild animals are involved, the actions must be carried out taking into account guidance from specialists in the species involved, environmental agencies and guidelines contained in supplementary documents. Animals with clinical signs should not be removed from the site or transported to animal rehabilitation centers.

14. TERMINATING ACTIVITIES AND RESTORING THE ZOOSANITARY STATUS

Having adopted all the measures described for the areas surrounding the outbreak, surveillance and protection, and with no further clinical, laboratory and epidemiological evidence of the presence of the agent, the outbreak is considered over, suspending all emergency procedures adopted for the region.

The country, zone or compartment that requests the status of free again of Avian Influenza or Newcastle Disease, must follow the technical guidelines and wait for the deadlines according to chapters 10.4 and 10.9 of the WOA "Terrestrial Animal Health Code."

15. APPENDICES

APPENDIX 1 - GLOSSARY

TO ENFORCE THIS CONTINGENCY PLAN, THE FOLLOWING DEFINITIONS APPLY:

- **Commercial birds:** birds bred or kept for the production of animal products intended for trade, or for breeding for such purposes.
- **Companion or ornamental birds:** birds bred or kept for the purpose of companionship or ornamentation.
- **Backyard poultry:** birds raised or kept in a single space, whose products are used exclusively on the same property where they are kept, without trade.
- **Biosecurity:** set of physical and management measures designed to reduce the risk of introduction, radication and spread of animal diseases, infections or infestations to, from or within an animal population (WOAH).
- **Depopulation:** systematic elimination of animals from a given epidemiological unit or area, through a technically acceptable and scientifically proven method, observing ethical principles.
- **Outbreak of HPAI:** an epidemiological unit with at least one confirmed case of HPAI. An HPAI case is the isolation and Identification of the agent or detection of specific viral RNA of any Influenza A virus characterized as highly pathogenic, according to the Manual of Diagnostic Tests and Vaccines for Terrestrial Animals of the World Organization for Animal Health (WOAH) in commercial farmed poultry.
- **Outbreak of NCD:** an epidemiological unit with at least one case of NCD. An HPAI case is the isolation and identification or detection of specific viral RNA of APMV-1 that complies with the criteria of virulence, according to the Terrestrial Animal Code of the World Organization for Animal Health (WOAH) in commercial farmed poultry.
- **Epidemiological unit:** a group of animals with a defined epidemiological relationship with similar probabilities of exposure to a given pathogen, according to the characterization of the Official Veterinary Service. Such a unit may be made up of one or more farms, group of farms, part of a farm, or group of susceptible animals to the disease, sharing the same environment or under common management practices or biosecurity conditions.
- **Epidemiological link:** evidence of exposure to the pathogenic agent or contact with probable or confirmed cases of a disease, indicating the possibility of transmission between susceptible animals, identified and determined by the Official Veterinary Service. The animal health measures conducted by the Official Veterinary Service are applicable to all establishments part of the epidemiological link.

APPENDIX 2 - ADDRESSES AND CONTACTS:

Points of contact of the PNSA at the Federal Superintendencies of Agriculture and Livestock SFA-MAPA

Points of contact of the PNSA in the State Veterinary Services



Ministry of Agriculture and Livestock

Secretariat of Animal and Plant Health
DEPARTMENT OF ANIMAL HEALTH

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