

CONTINGENCY PLAN

**IN CASE OF AN
OUTBREAK OF**

**NOTIFIABLE AVIAN
INFLUENZA (NAI)**

IN POULTRY

IN SOUTH AFRICA

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EDITION 3
REVISED JUNE 2009
REVISED BY: DR A C E PIENAAR

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Edition 3

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2 June 2009

Acknowledgements to:

OIE Manual, Ausvet Plans, Avian Influenza by Capua and Mutinelli, ProMed Mail, Avian Influenza Policy of National Directorate Animal Health, Action Plan for the Poultry Industry and Veterinary Profession, drafted by the AI Work Group of SAPA/SAVA and other sources.

1. INTRODUCTION

The intention of this contingency plan is that every veterinarian, animal health technician and veterinary technologist in the employ of the State, the poultry industry, private veterinarians, as well as other relevant institutions, are aware of the procedures to be followed during a suspected case of an outbreak of Notifiable Avian Influenza (NAI) and are thus in a position to act immediately.

The listed procedures and measures should be evaluated against the background that an outbreak can potentially occur anywhere, regardless of natural, agricultural or socio-economic characteristics of the locality. These features will dictate to a large extent which of the procedures and measures will be possible to implement practically in such a way that it will make a contribution to the control of the outbreak.

The circumstances may vary considerably between commercial and communal farming areas and controlled and open areas and should be seriously taken into consideration in the approach to and planning and implementation of a campaign.

The objective of this contingency plan is:

- To formulate the roles of personnel and procedures to be followed in the case of a suspected and/or confirmed outbreak of a controlled disease.
- To document the communication channels.
- To ensure that there is availability, deployment and necessary personnel to assist the veterinary disease control team with administration and procurement of necessary material and equipment.

2. DEFINITIONS

2.1 Definition of Notifiable Avian Influenza (NAI) (Proposed new definition by the OIE)

Notifiable Avian influenza (NAI) is defined by the OIE as an infection of poultry caused by any Influenza A virus of the H5 or H7 subtypes or by any AI virus with an intravenous pathogenicity index (IVPI) greater than 1.2 (or as an alternative at least 75% mortality) as described below. NAI viruses can be divided into highly pathogenic notifiable avian influenza viruses (HPNAI) and low pathogenic notifiable avian influenza (LPNAI):

- HPNAI viruses have an IVPI in 6-week-old chickens greater than 1.2 or, as an alternative, cause at least 75% mortality in 4 to 8 week-old chickens infected intravenously. H5 and H7 viruses which do not have an IVPI of greater than 1.2 or cause less than 75% mortality in an intravenous lethality test should be sequenced to determine whether multiple basic amino acids are present at the cleavage site of the haemagglutinin molecule (HA0); if the amino acid motif is similar to that observed for other HPNAI isolates, the isolate being tested should be considered as HPNAI.
- LPNAI are all Influenza A viruses of H5 and H7 subtype that are not HPNAI.

2.2 OIE Definition of ‘poultry’

Poultry is defined according to the OIE, as ‘all domesticated , including backyard poultry, used for the production of meat or eggs for consumption, for the production of other commercial products, for restocking supplies of game, or for breeding these categories of birds, as well as fighting cocks used for any purpose’.

Birds that are kept in captivity for any reason other than those reasons referred to in the preceding paragraph, including those that are kept for shows, races, exhibitions, competitions or for breeding or selling these categories of birds as well as pet birds, are not considered to be poultry.

2.3 Definitions as stated in the Animal Diseases Act (Act 35 of 1984) and the Regulations of the Act:

“**contact animal**”, in relation to a controlled animal disease specified in column 1 of Table 2, means a susceptible animal that was in contact with or is on reasonable grounds suspected of having been in contact with an infected animal or the progeny or products thereof;

“**infected animal**”, in relation to a controlled animal disease specified in column 1 of Table 2, means a susceptible animal that is infected, or is on reasonable grounds suspected to be infected with the controlled animal disease concerned;

“**poultry**” means pigeons, ducks, geese, fowl, turkeys, cage birds, muscovies, domesticated ostriches, tamed wild birds and wild birds kept in captivity;

Table 2 of the Regulations of the Animal Diseases Act (Act 35 of 1984)

Animal Disease	Nature, causal organism and symptoms	Susceptible animals	Controlled veterinary act to be performed in respect of		
			Susceptible animals	Contact animals	Infected animals
1	2	3	4	5	6
Highly Pathogenic Avian Influenza (fowl plague)	Highly pathogenic viral disease caused by virulent strains of influenza virus characterized by respiratory signs excessive lacrimation, sinusitis, oedema of the head, cyanosis of the unfeathered skin and diarrhoea	Poultry and birds	-	All contact poultry shall be isolated and destroyed by the responsible person under the supervision of an officer.	All infected poultry shall be destroyed by the responsible person under the supervision of an officer.

1	2	3	4	5	6
Avian Influenza	Viral disease caused by strains of influenza virus characterized by depression, decreased feed consumption, mild respiratory symptoms, lacrimation, sinusitis, oedema of the head, cyanosis of the unfeathered skin and diarrhoea	Poultry and birds	-	All contact poultry shall be isolated	All infected poultry shall be isolated.

2.4 Areas:

Definitions:

Infected premises (infected area)(IP): area (all or part of a property) in which the disease exists.

Suspect premises (SP): area containing stock that has possibly been exposed to the disease.

Dangerous contact premises (DCP): premises with stock showing no clinical signs of disease but which because of probable exposure to disease will be subject to disease control measures.

Declared Area: one which is subject to legal declaration and includes both a restricted area and a control area.

Restricted area (quarantine area) (RA): an area around an infected premises and subjected to intensive surveillance and movement controls. E.g. 3 to 5 km radius.
This should include any diagnostic laboratory receiving samples (Class A disease).

Control area (CA): a buffer between the RA and the areas free of disease where restrictions will reduce the chance of disease spreading further afield. E.g. minimum of 10 km radius.

3. BACKGROUND

Avian influenza AI is a highly contagious viral disease of domestic poultry and many species of wild birds caused by infection with a Type A influenza virus. Type A viruses can cause infection in man, pigs, equines, birds and marine mammals. The virus has a worldwide occurrence and may occur as a low pathogenic strain (LPAI) or as a high pathogenic (virulent) strain (HPAI). The latter form is, according to the current OIE* disease listing, a notifiable disease and could result in mortality approaching 100% in chickens, turkeys, guinea fowl etc.

* OIE = Office International des Epizooties (World Organisation for Animal Health)

HPNAI has never occurred in this country in the chicken industry however HPNAI virus of H5N2 subtype was isolated from ostriches in the Eastern Cape Province in July 2004. Another unrelated outbreak involving the H5N2 subtype occurred in ostriches in the Southern Cape in 2006. Avian influenza viruses were previously found in ostriches in this country in 1991, 1994 and 1995. LPAI (H6N2) was reported and confirmed for the first time in the commercial chicken industry in this country following outbreaks of disease in KwaZulu-Natal in 2002 and subsequently in Gauteng, the Free State, North-West, Mpumalanga and Western Cape Provinces.

3.1 RSA Poultry Industry.

The industry is important for the country's food security as it is the major supplier of animal protein and comprises many direct and indirect industries.

The South African poultry industry is broadly divided into four parts:

- A large commercial/industrial sector
- A widely distributed small-commercial sector
- A widely distributed village poultry population, back-yard poultry and pet bird collections.
- Ostrich industry.

3.2 Poultry and related industries:

- Primary and secondary breeder farms
- Hatcheries
- Broiler /grower farms
- Layer farms
- Pullet rearing farms
- Non-commercial sector
- Abattoirs
- Further processing
- Egg depots
- Retail outlets
- Feed industry
- Pharmaceutical industry
- Poultry equipment, building, electronics, manufacturing and supply industry

3.3 Impact of an outbreak of HPAI

- Direct effect on poultry production within RSA.
- Direct effect on trade
- Direct effect on Export (reporting to OIE), trade bans etc
- Allied industries
- Employment
- Food security
- Movement of live poultry and products
- Media reaction
- Public reaction/fears
- Public health implications.

This would thus be a devastating disease for the various parts of the industry, the village chicken farmer, the country and also for the southern African region.

3.4 Risk of disease spread

- The disease is highly contagious as the virus rapidly multiplies in susceptible flocks, virus is excreted in the air and in the faeces.
- Direct spread is via contact with live birds, infected premises, infected products, contaminated equipment, or by movement off site of personnel, vehicles, etc.
- Virus can survive in/on carcasses, feathers, meat, on eggs, offal, faeces/litter.
- Live bird markets/sales are an important potential source for the rapid dissemination of epidemic diseases.

NB: This disease could appear in more than one Province within a short space of time because of the ease of spread and bird movement from a single initial introduction!

3.5 Possible routes of entry of virus into country

- **Possible routes of entry:**
 - Importation of live birds (domestic or other)
 - Importation of poultry products
 - Smuggling of birds or products
 - Return of persons who have been in direct/indirect contact with infected chickens/premises overseas
 - Wild birds especially waterfowl and waterbirds. (Important to recognise the danger of open dams/vleis near poultry premises which may be used by wild birds. Water drawn from such areas could act as a source of virus gaining access to poultry flocks).

3.6 Early detection of disease

A commitment is required from the Government and organised industry, as well as the veterinary profession as the control of NAI cannot succeed without commitment and transparency from all parties involved!

Awareness, early detection and early reaction are the keys to control! (see Appendix 5).

Early detection, reporting and diagnosis of disease together with the swift imposition of effective eradication and movement controls are essential in an attempt to contain an outbreak!

4. ROUTINE CONTROL AND SURVEILLANCE

The Department of Agriculture, Forestry & Fisheries (DAFF) has the following ongoing protective measures in place to prevent an outbreak of NAI in South Africa and to be prepared in the case of an inadvertent introduction of the virus:

4.1 Import control:

South Africa is determined to maintain its NAI freedom and has very strict import requirements in place:

- International developments are followed very closely
- Live birds are only imported from countries that have been free for the preceding 3 months. If there is any uncertainty, the country is regarded as positive until proven otherwise.
- Any birds that are imported from free countries are quarantined and tested in South Africa in any case. Importation of poultry meat from AI free countries is only allowed from South African approved processing establishments.
- Products of poultry origin (e.g. feathers) are only allowed to be imported if treated to inactivate the AI virus.
- Live pigs (not imported in large numbers in any case) are also not imported from AI positive countries.

4.2 Surveillance:

DAFF has an extensive surveillance programme in place for all domesticated ostriches, commercial and non-commercial chickens to ensure that the introduction of the virus into the country is detected without delay. The programme has been extended to include domesticated emu birds as well. See Appendix 9 for full surveillance protocol.

4.3 Awareness

Awareness campaigns are conducted from time to time by the Directorate: Animal Health together with the Directorate: Agricultural Information Systems and coordinated with the Department of Health. This includes TV and Radio coverage and press releases regarding the safety of poultry products. Special newspaper releases are planned in advertising space to ensure that the right message is carried across.

4.4 Continued liaison with Department of Health

Continued liaison with the Department of Health is essential:

- Meetings of the National Outbreak Response Team (NORT) of the Department of Health are attended by a representative of DAFF.
- If any positive samples are obtained during routine surveillance, the information is supplied to the Department of Health
- Any actions by the Department of Agriculture, Forestry & Fisheries (DAFF) must be in accordance with the 'Influenza Pandemic Preparedness Plan' of the Department of Health, where applicable.

5. SUSPECTED OUTBREAK

5.1 Communication protocol:

In terms of the Animal Diseases Act (Act 35 of 1984), the nearest state veterinarian should be informed should a suspected case or outbreak of disease occur.

5.1.1 In the case of a private veterinarian who suspects or diagnoses NAI:

- The nearest state veterinarian should be informed
- The private veterinarian may take samples and forward them to the laboratory via the state veterinarian of the area.

5.1.2 In the case of an animal health technician who suspects or diagnoses a controlled disease:

- The state veterinarian (SV) should be informed.
- A SV thus informed must cease other tasks and immediately go to the suspicious place, prepared to take samples.

5.1.3 In the case of a SV who suspects or diagnoses a controlled disease:

- Samples should be collected and forwarded to the laboratory.
- The Provincial Director Veterinary Services (PDVS) should immediately be informed of the suspect or confirmed diagnosis of a controlled disease.

- The PDVS should inform the National Director: Animal Health, his/her Head of Department (HOD), MEC and provincial cabinet.

5.1.4 If a veterinary laboratory receives samples of a suspected or confirmed diagnosis of a controlled disease:

- The SV from the area from which the samples arose should be informed
- The Provincial Director, Director of the Veterinary Laboratory and National Director: Animal Health should be informed

5.1.5 Responsibilities of the Director Animal Health:

The Director: Animal Health (as ‘director’ in terms of the Animal Diseases Act, Act 35 of 1984) will, according to the information received, make the decision about declaring a suspected or confirmed outbreak of NAI

The Director Animal Health will in the case of a suspected or confirmed diagnosis of a controlled disease:

- Inform the Programme Manager immediately within 12 hours of knowing about the incident
- The Programme Manager will then inform the Chief Communications Officer, Deputy Director General and Director General within 12 hours of knowing about the incident.
- The Director General will inform the Deputy Minister or Minister, members of the Justice Crime Prevention and Security Cluster (JCPS), Department of Public Works and Treasury and request assistance as required.
- A cabinet memorandum should be written by the Director Animal Health (DAH) at the same time, in order to inform Cabinet.

5.1.6 The Communications Officer will, in consultation with the DAH and his/her epidemiology unit (and after receiving confirmation of the diagnosis) inform:

- All stake holders (including the Department of Health)
- Trading partners
- SADC livestock production and health co-ordinating centre
- World Organisation for Animal Health (OIE)

5.2 Collection of samples

The state veterinarian / animal health technician has to proceed with **utmost urgency** to collect the following samples from the respiratory and/or intestinal tract for the confirmation of avian influenza:

Include the following:

- **Dead birds:**
 - Pooled trachea, lung and intestinal samples and cloacal swabs.
- **'Healthy' birds:**
 - Cloacal and tracheal swabs
 - At least 10 blood samples from the flock
 - (Cloacal swabs from at least 30 birds – confidence level of 95% if prevalence of excretors >0.1. Ensure that at least one gram of faeces on swab; transport swabs in virus transport medium. Use plastic swabs (not wooden, as it could contain PCR inhibitors).
- Place organs separately into sterile plastic tubes, bags or sample bottles and send to an official laboratory (at present the Onderstepoort Veterinary Institute, Allerton and Stellenbosch Provincial Veterinary Laboratories) or a Department of Agriculture, Forestry & Fisheries (DAFF) approved private laboratory.
- All samples to be sent on ice (4°C).
- Swabs should be placed in 2 to 5 ml sterile PBS.
- **Packaging:**
 - Leak-proof containers, wrapped in at least TWO layers of plastic and disinfected on the outside. All placed in a clearly addressed container (address of consignee and consignor) plus official labelling i.e. Infectious Substances label and Biological Material label.
 - Refrigerated or on-ice transport

5.3 Transport of samples

Transport of samples must be direct to the officially designated laboratory with prior contact and notification of the despatch of the samples.

5.4 Laboratory confirmation

5.4.1 The isolation of avian influenza virus is to be done according to recognised international standards, as determined by the OIE. Ref. OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (mammals, birds and bees).

Samples of allantoic fluid from the suspect isolate to be forwarded to Biotechnology Division, OVI for molecular analysis via RT-PCR testing for AI and for amino-acid sequencing of the fusion protein site. The collection and comparison of isolates to evaluate antigenic drift during an outbreak is essential.

- 5.4.2 A confirmed AI isolate should be sent to the international OIE Reference Laboratory (Weybridge in UK) for the determination of the full antigenic subtype of the virus.
A specific Import Permit for Weybridge is needed to accompany the specimen/s (keep copy on file for when needed).

Send sample/s via courier to physical address:
Veterinary Laboratories Agency-Weybridge,
Avian Virology
New Haw,
Addlestone,
Surrey KT15 3NB
United Kingdom.

Notify Weybridge of the type and number of samples sent.
Tel: +44 (0)1932 341111
Fax: +44 (0)1932 347046
E mail: r.manvell@vla.defra.gsi.gov.uk
i.h.brown@vla.defra.gsi.gov.uk
aiwrl@vla.defra.gsi.gov.uk

- 5.4.3 Classification of isolate as NAI.
(See definition on page 5)

6. DISINFECTION

- 6.1 After handling a suspect infected or confirmed infected animal, the official must immediately disinfect his/her hands, shoes, glasses, hat and any clothing that he/she wore during the preceding inspections on that farm/premises and any other thing that might be contaminated.
- 6.2 Depending on the animal disease suspected or confirmed, any official who has been in contact with suspect infected or confirmed infected animals must not come into contact with any other susceptible animal or visit another farm for at least 5 days after his/her last contact.

7. FIELD ACTIONS FOR CONFIRMED OUTBREAK

7.1 Strategy for disease control

Eradication/control procedures are more likely to be successful if two main conditions are met:

- (1) Early identification of the primary outbreak
 - (2) The rapid implementation of control measures.
- **Compulsory measures:**
 - Immediate quarantine and movement controls to prevent contact between infected and susceptible birds.
 - Biosecurity measures
 - Zoning of restricted (infected) area/s (road blocks), control (surveillance) area/s and disease free areas
 - Immediate stamping out and disposal of infected and in-contact birds and litter etc. to terminate the multiplication of virus (euthanasia).
 - Decontamination
 - Tracing and surveillance and epidemiological investigations.
 - Testing for absence of disease before restocking.
 - **Disease control network:**
 - Central control unit (also for supply of information to the public)
 - Staff structure of disease control centre
 - Peripheral control units
 - Laboratories
 - **Public health issues**
 - Vaccination of staff and labour physically in contact with infected birds/material may be required for particular subtypes of virus e.g. H5N1 which has been shown to have zoonotic potential.

7.2 Disease Control Centre

A Disease Control Centre has to be established to co-ordinate the necessary actions to be taken during the control of the disease outbreak. The structure of such a centre is described in Appendix 4, while a full job description of all senior posts is given in point 5 of Appendix 4.

- The number of staff needed will have to be assessed according to the size and location of the disease outbreak.
- The Provincial Director will identify persons with the required competencies for the Control Centre Posts.
- A Veterinary Committee will be established as described in Appendix 4.

7.3 Responsibilities

These responsibilities include those of veterinary officials and other institutions during the planning and implementation of the campaign. (See Appendix 4).

7.3.1 Veterinary Officials

➤ Director Animal Health

- Disseminates information
- Authorises destruction of animals
- Issues directives
- Authorises personnel
- Appoints valuation committee
- Arranges for detachment of personnel from other veterinary regions and provinces

7.3.2 Department Of Agriculture, Forestry & Fisheries (DAFF) (Besides Animal Health)

- Supply fencing material
- Assist with fencing
- Assist with transport and obtaining heavy equipment
- Engineering advice

7.3.3 SA National Defence Force (SANDF)

- Supply required vehicles and communication, camping and/or roadblock equipment
- Assist with transport
- Assist with patrols and roadblocks
- Assist with tents and other camping equipment
- Supply field decontamination showers

7.3.4 S A Police Services

- Supply required roadblock equipment
- Assist with roadblocks
- Assist with law enforcement

7.3.5 Provincial and Metropolitan Traffic Control

- Assist with road blocks
- Assist with searching of vehicles

7.3.6 Provincial Disaster Management

- Assist with disease campaign in general

7.4 Quarantine and movement controls

- The situation should be evaluated, as to the type of poultry operation, number of positive flocks, contiguous premises, dangerous contact premises, surrounding area etc. the amount of tracing required and estimated date of initial infection.
- Determine the Infected Premises IP, Suspect Premises SP and Dangerous Contact Premises DCP.
- Determine the Declared Area that includes both the Restricted Area RA and Control Area CA.

7.4.1 Upon receipt of confirmation of a diagnosis

- A farm should be placed under quarantine by issuing a quarantine notice (original notice form to be kept by relevant SV office, copy to be supplied to owner of farm)
- No movement of poultry and poultry products will be allowed (implied under the quarantine restrictions)
- The SV will take stock of all poultry, feed and poultry products on the farm (this should be done by and kept by the SV office) (implied under the quarantine- restrictions).
- The SV will establish the number of birds on the farm, the sourcing and selling of birds and determine the history of flocks (backward and forward tracing)
- The SV will check the feeding practice on the farm (s) and trace back all manufacturers of feed.
- The farm should be monitored 24 hours a day

In the case of a communal area the SV should:

- Place all poultry present in the affected area under quarantine
- Inform all leaders of the affected community and adjacent community
- Organise to have the communal area monitored 24 hours a day

In the case of a private veterinarian who finds a suspected case of a controlled disease, a verbal quarantine notice should be served and he/she will await the arrival of the SV of the affected area.

7.4.2 Movement restrictions – apply 24 hours per day.

- The official must arrange for all access gates to the affected farm/premises or communal area to be closed and locked.
- A single combined entry / exit point.
- An official, other than the official who detected the suspected infection, should be placed at the access gate of the farm (assistance from the SAPS or SANDF should be sought and they should be authorised in terms of the Animal Diseases Act (Act 35/1984).

- In communal farming areas all entry and exit points should be identified (this can only be done if practically possible and worthwhile).
- The SV will cancel all permits issued during the preceding 21 days.
- The SV will trace all movements to and from the suspicious farm/premises within the preceding 21 days, by checking of the permit register and, more importantly, by word of mouth from any involved animal owner or anyone else.
- The SV will cease issuing permits to the affected farm/premises and surrounding premises or communal area.
- Establish road block positions on periphery of infected area
- Road block requirements: personnel, signage, toilet facilities, water supply, lighting, torches, protective clothing, generator, fuel, disinfectant, spray operators
- No movement of any poultry or poultry products from or to the restricted area.

There shall be no movement of poultry or poultry products from premises in the control area without (1) physical inspection and (2) the issuing of a red cross permit by the disease control headquarters in accordance with the movement control policy in effect at the time.

7.4.3 Biosecurity measures

Access to infected premises.

Set up effective telephone and/or radio contact with staff on infected premises.

All personnel require a complete change of clothing when entering / leaving the farm.

Change room:

- **Equipped with:**
 - properly operated showers
 - large plastic bags
 - boxes
 - sets of latex gloves
 - disinfecting solution and soap
 - protective clothing including footwear
- **Vehicles:**
 - Leave premises only if absolutely necessary
 - To be washed and disinfected: outside AND inside (floor mats, foot pedals, door sills).
- **Staff:**
 - Ensure that they are fully aware of required procedures

- **Avoid** contamination of natural/artificial water reservoirs
- **Transport** of any samples must be direct to the officially designated laboratory
- **Activation** of a mobile disinfection unit at the only entry/ exit to the premises
- **Decrease the number of:**
 - vehicles
 - personnel
- **Organise:**
 - Method of destruction of birds and materials required.**
 - Location, placement and size of burial trenches.**
 - **Depopulation crews**
 - Excavator operators (disposal of infected material by burial)
 - Transport vehicles (disposal of infected material by rendering)
 - **Disinfection crews**
- Each Province has to put these crews together **AT THIS STAGE ALREADY**, to be on **standby**
 - Identify and train members of the crew
 - Ensure that equipment etc is available
 - Decide on control measures depending on local factors
- **Training** of veterinary staff in recognition of disease/action to take etc in near future and on arrival at Control Centre.
- Draw up or refer to **regional maps** showing poultry farms, owner and address details, type of enterprise, total stock size, house numbers etc. If these maps are not available at present, care should be taken to draw up such maps at this stage already.
- **Media liaison** policy for local and national level.

7.5 Depopulation and disposal

If the slaughter out policy is to be applied for a particular disease:

- The DAH will authorise the destruction of animals.
- All animals to be destroyed should be well identified, condition scored and a market value should be determined (a specifically designed form should be used).

- Accurate records of type of poultry, numbers, ages, average weight of poultry and number of eggs and quantities of feed to be destroyed should be kept (where necessary use cameras).
- Compensation will be paid upon approval by the Minister.

Speed is of the utmost importance

Perform with doors closed to prevent access of wild birds, other animals

- **Staff and equipment required:**
 - Quarantine identification
 - Mobile disinfection units
 - Security lights (night)
 - Official Vet
 - Staff (for depopulation and bird removal etc.) including protective clothing, masks, goggles. (Vaccination with current WHO recommended influenza vaccine and anti-viral treatment for suspected human infection with HPNAI).
 - Vehicles (ensure that no feathers or faeces can fall/blow off the truck, by installing a frame with a double layer of plastic on either side of the truck)
 - Identification of routes for vehicles with dead birds
 - Police – escort trucks
 - Signs: Roadblock/Control Point/No Entry/Quarantine Area etc.
- Protection of burial site to prevent theft! Trench depth, top most bird depth and cover with razor wire.
- Gas, drugs, etc. to kill birds.
- Appropriate containers for infected material.

7.5.1 Killing of birds

- Environmentally controlled house: stop fans, close off ventilation, infiltrate gas.
- Small house: Seal house or remove birds into containers for gassing or dislocation of necks or euthanasia.
- Gassing: CO₂ (use 17,5 kg/1000 m³). Birds need to be exposed to an atmosphere of at least 30% carbon dioxide to ensure loss of consciousness and then at least 70% carbon dioxide to kill the birds. This concentration must be maintained for at least 3 minutes.
- Mechanical: eggs, chicks.
- Other:

7.5.2 Disposal

- Burial trench 3 metres wide (not more than 3 m wide) and 3 metres deep. Cover with soil to a minimum depth of cover over birds of 1.5m. (This size trench will carry about 1 200 x 6 week old broilers per linear metre.)

Bottom of trench must be at least 1 metre above the water table.

- Non-disinfectable biodegradable material to be buried with the birds
- Cover with layer of calcium hydroxide (quick lime).
- Must be protected against theft e.g. razor wire over the excavated area.

7.5.3 Rendering:

- Transport in leak-proof containers
- Location of the establishment is important
- Contact between rendered material and infected material must not be possible

7.5.4 Disposal/destruction of infected material

- **Eggs:**
 - Eggs
 - Egg trays
 - Egg products
 - Burial
 - Rendering
- **Litter:**
 - burial (as 6.4.2 above) or spray with disinfectant, cover with plastic sheeting
 - leave for at least 42 days and record core temperature
 - Protect against birds, animals.
 - Incineration
- **Animal feed:**
 - fumigation, then incineration or burial.
 - Protect against theft
- **Feathers:** spray with disinfectant, bury or incinerate.

7.6 Decontamination

- **All units connected:**
 - Physically
 - Functionally
- **Vehicles:** See 6.4.3

- **Walls, floors, ceilings:**
 - Remove organic material
 - Wash
 - Disinfect

- **Equipment:**
 - Wash
 - Treat with disinfectant for at least 48 hours

- **Water reservoirs:**
 - Empty
 - Wash
 - Disinfect

- **Feed tanks:**
 - Empty
 - Wash with hot water (pressure)
 - Fumigate

- **After washing and disinfection:**

- **Units:**
 - fumigate twice with an interval of 2 weeks

Protective clothing and footwear:

Disinfect, wash, re-pack.

Disinfectants:

Any disinfectant currently registered for use in South Africa in terms of Act 36/1947 or according to the SABS

E.g.; detergents, hypochlorites, alkalis, glutaraldehydes, QAC's etc.

Quaternary ammonium	4% solution	Equipment
Formalin and permanganate	Fumigation	Walls, floors, ceiling
		Electrical equipment, hatcheries
Na hypochlorite	2% active chlorine	Equipment

7.7 Tracing, surveillance and epidemiological investigation

All movements of poultry, poultry products, potentially infected materials, vehicles to and from the infected premises to be traced and recorded up to 21 days before the premises became infected.

Surveillance:**Organised National Surveillance.**

- Serological testing of commercial and village chickens, post mortem examinations in diagnostic labs, sentinel birds, monitor certain high density waterfowl/waterbird areas for the presence of virus.
- Continuous surveillance of all poultry premises should take place within the Control Area
- Surveillance involves physical inspection of poultry for clinical signs of avian influenza, increased mortality and serological sampling
- No of samples: Minimum of 29 samples per epidemiological unit
- Serological samples should be tested by means of either the ELISA, HI or AGID test.
- No repopulation until at least 21 days have elapsed since cleaning and disinfection has been completed satisfactorily and the outbreak brought under control in the Restricted Area.
- Sentinel birds (birds tested and found to be free of antibodies against avian influenza immediately before placement) can be used on a previously infected premises as a means of confirming the absence of the disease. Sentinel birds will only be allowed into the area on the authority of the Disease Control Officer.

8. REPORTS**8.1 Inspection Report**

- | | | |
|----|-------------|---|
| a) | Contents | Inspection (and vaccination) data including counts, suspicious animals, clinical signs, mortalities, distances traveled |
| b) | By whom | Inspection AHT |
| c) | Frequency | Daily |
| d) | To whom | Technical Field Officer |
| e) | Compilation | Weekly to Field Operations Manager (FOM) |

Suspicious animals, mortalities and any problem must be reported immediately and daily to the FOM.

8.2 Cordon Report (Cordon around restricted area)

- | | | |
|----|-----------|---|
| a) | Contents | Personnel, patrols, fences, distances travelled |
| b) | By whom | Cordon AHT |
| c) | Frequency | Weekly |

- d) To whom Technical Field Officer
- e) Compilation Weekly to (including gate reports) Field Operations Manager

Any stray animal and any problem must be reported immediately and daily to the cordon master and by him to the Control Centre (CC).

8.3 Road Block Report

- a) Contents Thoroughfare of people and vehicles, confiscations, distances travelled
- b) By whom Gate AHT
- c) Frequency Weekly
- d) To whom Technical Field Officer
- e) Compilation Weekly to (including cordon reports) Field Operations Manager

Any problem must be reported immediately and daily to the cordon master and by him to the CC.

8.4 Stores Report

- a) Contents Issues, receipts, stock on hand, needs, write-offs of all material, equipment etc" distances traveled
- b) By whom Store master
- c) Frequency Weekly
- d) To whom Administration Manager.

Any problem must be reported immediately and daily to the CC.

8.5 Transport Report

- a) Contents Distribution, needs of vehicles, distances travelled
- b) By whom Transport officer
- c) Frequency Weekly
- d) To whom Administration Manager

Any problem must be reported immediately and daily to the CC

8.6 Personnel Report

- a) Contents Distribution, status, needs of permanent and temporary staff
- b) By whom Administrative officer
- c) Frequency Weekly
- d) To whom Administration Manager

Any problem must be reported immediately and daily to the CC

8.7 Movement Permits

- | | | |
|----|-----------|--|
| a) | Contents | Number and nature of movement; permits issued, origin and destination. |
| b) | By whom | Movement Control Officer |
| c) | Frequency | Weekly |
| d) | To whom | Disease Manager. |

Any problem must be reported immediately and daily to the CC

8.8 Campaign Monthly Report

- | | | |
|----|-----------|---|
| a) | Contents | <ul style="list-style-type: none"> – Demarcation of infected and quarantine areas with animal and numbers – Description of infected herd(s) – Inspection and vaccination summary – Cordons and gates summary – Stores summary – Transport summary <ul style="list-style-type: none"> ○ vehicles from transport report ○ distances travelled from various reports – Personnel summary – Financial summary – Epidemiological comments |
| b) | By whom | Disease Manager |
| c) | Frequency | Monthly |
| d) | To whom | Disease Control Officer |

8.9 Campaign Final Report

The Disease Manager submits a final report after the campaign on the format of the monthly report to the Disease Control Officer for submission to the Standing Veterinary Committee for further distribution.

9. TERMINATION

The Disease Control Officer approves through the channels the cancellation of quarantine not less than three months after the clinical endpoint, after all animals in the Infected and Control Areas have been inspected and found to be healthy.

- After approval, the SV cancels quarantine.
- All equipment is handed back via the AHT's and their campaign supervisors to the Administration Manager.
- Any item lost or broken will be paid for by the responsible person.
- Fences and gates are removed.
- All temporary labourers are dismissed.
- All officials return to their normal stations.
- Local officials resume their normal duties.
- Normal control measures of the area are applied.

10. COMPENSATION

Act 35 of 1984 [Article 19 (1), (2)]

- compensation arrangements whereby farmers or others can be paid fair and quick compensation for any animals or other property destroyed as part of a disease control campaign.

APPENDIX 1

RECOMMENDATIONS

1. RISK REDUCTION

- Isolation of farms
- If premises, buildings are easy to decontaminate (impervious surfaces) then see a faster return to normal.
- Partitioning of farms into separate sites
- Breeder farms, layer farms, broiler farms more than 1 km from other farms. A minimum of 200 m between age groups.
- Biosecurity of sites.
- Water source: Dams and open water are areas for possible contamination by water fowl. Ensure treatment of all water used for production purposes.
- Houses; rodent and bird proof.
- Feed storage: rodent and bird proof, enclosed silos, plastic or multi walled bags. Prevent feed spillage.
- Hatchery: Through flow, non-returnable chick boxes, separation of batches of eggs, records of date of lay, supply sites
- Processing plant: flow pattern, live birds physically separated from processing area, separate supply flocks at scalding, defeathering, evisceration, chilling and packing.
- Waste disposal care.
- Egg sorting, processing plants: separate supply flocks.
- Identification of batches, farms and flocks.
- Diagnostic laboratories: limit people access, control carcass/material disposal, via incineration.
- Informal sector for egg sales, live bird sales within Quarantine Zone – instruction for nothing to move off the premises or out of the zone.

2. CONTROL MEASURES TO PREVENT THE ENTRY OF THE VIRUS INTO THE COUNTRY:

South Africa is currently free from HPNAI and two Acts play a role in maintaining this freedom: Animal Diseases Act (Act 35 of 1984) and the Meat Safety Act (Act 40 of 2000). The following measures are in place to safeguard against the introduction of this virus into the country:

- No live poultry, birds or ANY poultry products are allowed into the country, unless an import permit has been obtained from DAFF. An import permit is only issued once the risk of importation has been assessed and found to be acceptable.
- The importation of live poultry and poultry products are only allowed from countries that are free from NAI.

- Imported live poultry and birds are subjected to post-importation quarantine at approved quarantine stations in the country (30 days in the case of birds, 8 weeks in the case of poultry). Poultry (including chickens and waterfowl) are bled and specifically tested for the absence of NAI, while other birds that are considered to pose a risk are quarantined in the presence of sentinel chickens, which are bled and tested before quarantine is lifted. All imported poultry and birds are observed for clinical signs of disease while in quarantine. Birds dying in quarantine are sent to an official government laboratory or DAFF approved laboratory for examination and routine testing for the presence of NAI.
- Imported birds that have been caught in the wild in other countries are quarantined in the country of origin in a South African Veterinary Services approved quarantine facility and bled and tested for NAI. Once imported, they are quarantined, bled and tested again.
- South Africa is not situated on one of the world's major water fowl migration routes between the northern and southern hemispheres of the world. The goose and duck species are either resident or are intra-African migrants. However several wader species do have a defined migration route between the far-east and South Africa. It is therefore prudent not to use water from any open standing or running water sources without treatment. Water is considered a means of virus preservation as well as a medium of potential transmission.
- Continuous monitoring of the disease status of all trade partners is essential to prevent the importation of products from infected countries (however, there is a 'window period' in which importation could still take place before a country has officially reported the outbreak to the OIE.
- Illegal importation (Smuggling):

The importation of live poultry or birds or poultry products without a permit poses a serious threat to the poultry industry, as it could allow entry of the virus into the country. The following actions are thus required:

 - Train officials at ports of entry
 - Alert police at ports of entry

Officials at the ports of entry need to be alerted to the possibility of the importation of 'mixed content' containers (e.g. clothes and poultry products in the same container)
- Return of persons from a known infected country or region:
 - Train officials at ports of entry
 - Footbath (disinfectant-impregnated sponge mat) at airport
 - Create awareness of responsibility of persons not to visit or be in contact with poultry, poultry farms etc when visiting known HPAI infected countries/areas.

- Declaration card by returning passengers of not having been onto farms etc when re-entering country. (If so to walk across sponge mat as above).
 - Customs/Immigration officers to know which countries are experiencing disease outbreaks.
 - “Exotic disease control Posters” at airports in departure lounges, immigration halls, baggage collection areas etc.
- Wild birds

It is important that all poultry houses are as bird and rodent proof as possible.

3. AWARENESS AND EARLY DETECTION

- Non-commercial farmers will either directly or indirectly inform their animal health technician, who will in turn inform the local state veterinarian, or he/she will contact the nearest commercial farm. It is thus essential that regular close contact is maintained between animal health technicians and all commercial and non-commercial poultry farms in their respective areas. All AHT's thus need to be aware of and trained in the recognition of exotic poultry disease.
- Intensive production farms (broiler, breeder, layer): these routinely have daily inspections of stock and production standards, mortality charts etc.
- Hatcheries monitor hatchability, egg quality, production throughput, and can trace back to supply flocks of origin etc.
- Processing plants have ante mortem inspection where clinical signs, increase in mortality etc are quickly apparent.
- Diagnostic laboratories/company veterinarians – probably one of the first groups for exotic disease to be suspected, confirmed or ruled out.
- Training for awareness of signs of exotic disease.
- Training of staff: – on poultry farm, in-house farm management, hatcheries, feed and pharmaceutical company representatives, Vet Services personnel e.g. AHT's/SV's, etc.
- State vet meetings – reminder of exotic poultry diseases.
- Radio/posters/brochures etc

APPENDIX 2

LABORATORIES

- Well equipped and experienced in the diagnosis of avian viruses including avian influenza virus:
 - diagnosis of the disease needs to be fast and reliable
 - two procedures are required i.e. biological virus isolation and RT-PCR with molecular sequencing of the haemagglutinin cleavage site.

- Laboratories:
 - Isolate and identify suspect virus, contain infective material and effectively inactivate and dispose of the material.
 - Competent diagnostic centres be registered/recognised and have necessary expertise, facilities and reagents for rapid diagnosis / characterisation / differentiation of this disease.

APPENDIX 3

STRATEGY FOR DISEASE CONTROL FOR LPAI (OTHER THAN HPNAI OR LPNAI: H5 or H7)

- The Animal Diseases Act (Act 35/1984) has been amended to make ALL SUBTYPES OF AVIAN INFLUENZA a controlled disease. This means that any outbreak or suspicion of an outbreak has to be reported to the nearest state veterinarian or animal health technician.
- An extensive voluntary monitoring action in the entire country is required to determine the extent of LPAI. This has been included in many existing routine serological monitoring as part of health plans.

RECOMMENDED ACTION PLAN

The guidelines included in this action plan need to be applied in close co-operation with the poultry veterinarian of the producer.

The following action is required if a positive situation is identified:

1. The situation should be evaluated, as to the type of poultry operation, number of positive flocks, contiguous premises, dangerous contact premises, surrounding area etc. the amount of tracing required and estimated date of initial infection.

Determine the Infected Premises IP, Suspect Premises SP and Dangerous Contact Premises DCP.

Determine the Declared Area that includes both the Restricted Area RA and Control Area CA.

2. **In the case of a positive situation in:**

2.1 Broilers

- Broilers to be reared in bird-proof facilities to slaughter age. To facilitate safe movement of apparently healthy birds within an infected area, these birds are to be transported to the closest poultry abattoir for slaughter with a red cross permit* issued by the relevant local state veterinarian.

* A red cross permit is used where poultry or poultry products to be moved are potentially infected and therefore subject to one or more restrictions en route or at destination.

- Movement of personnel in and out of houses, dead birds from houses, litter, etc. should be controlled so as to prevent the spread of the virus.

- All vehicles, especially feed trucks should be adequately disinfected prior to leaving the farm.
- Consult a poultry veterinarian or office of the Southern African Poultry Association (SAPA) to assist in assessing the successful recovery from the outbreak or other matters pertaining to control measures.

2.2 Breeders (broiler and layer breeders)

➤ **Rearing:**

Determine the exact status of every house with regard to the presence of AI virus/antibodies through the involvement of a poultry veterinarian and in consultation with the provincial DVS. (Immunization may constitute an important part of the prevention of disease spread and recovery).

➤ **Breeders in production:**

- Determine the exact status as indicated above.
- Immunization of birds in non-infected houses and those possibly in the early stages of the disease in consultation with a poultry veterinarian may be indicated.
- Improve egg shell and egg tray sanitation by disinfection
- Improve chick crate hygiene
- Disinfect (spray) all vehicles (feed trucks and egg trucks) leaving the farm
- Although AI is not known as an egg-transmissible disease, day-old chicks should be checked with laboratory methods for possible in-chick transfer (faecal contamination of eggs poses a risk of chick-associated mechanical transmission as a result of faecal contamination of egg shells).
- Consult a poultry veterinarian for assistance when informing clients who buy day-old chicks or other products.
- Monitor the off-spring:
- Feedback on the outcome of the AI status in flocks of clients constitutes important information for a consulting veterinarian in order to suggest appropriate control measures.

➤ **Additional important measures:**

- Implement appropriate procedures to limit the risk of virus spread
- Litter and culls
- Place susceptible birds as sentinels among birds in the houses to be culled approximately three weeks before culling to assess the status of infection.
- Check the serological status of these sentinels before the movement of any culls or litter to determine the risk of virus spread by these products.

- Consult a poultry veterinarian for a suitable source of sentinel birds.

➤ **New placements:**

Consult a poultry veterinarian for appropriate preventive measures applicable to replacement flocks during the course and recovery period of the outbreak.

2.3 Layers:

- Layers in cages have minimum contact with their droppings and eggs for human consumption pose a low risk for virus dissemination. The marketing of table eggs can thus be regarded as a low risk practice.
- In the case of a multi-age production system, serological determination of the exact status has to be carried out.
- The stabilisation of the infection by selective immunisation constitutes an important part of the prevention of virus spread and disease recovery.
- Eggs from an AI positive farm should be handled in the following manner:
 - If egg washing facilities are available, the eggs should be washed by employing a chlorine-based disinfectant or suitable alternative. Spray or fumigation.
 - Dirty eggs should be kept on the farm for one week to allow for virus inactivation before marketing
 - Clean eggs may be marketed as is after a retention period of three days on the farm at room temperature.
- In the case of replacement pullets:
 - Determine the exact status as indicated above.
 - Immunization of birds in non-infected houses and those in the early stages of the disease in consultation with a poultry veterinarian may be indicated.

2.4 Ostriches

Measures will be based on the same principles as for broilers/layers/breeders

3. Control measures pertaining to the area surrounding an outbreak:

- 3.1 The following procedures may be of value in order to organise these control measures:
- The poultry farms in the area surrounding an outbreak should be divided into two zones, namely a high risk and a low risk zone.
 - A high risk zone will constitute a radius of approximately 3 to 5 kms in which there is a definitive likelihood of the spread of the virus by direct natural mechanisms.
 - Actions to be executed in the high risk zone include the following:
 - Identification of the production units with the help of the DAH, SAPA, the Poultry Group of the SAVA or local industry representatives.
- 3.2 Commercial Poultry production units to be requested by SAPA to implement the following guidelines in co-operation with a poultry veterinarian:
- Determine the exact status of the disease by means of serology/virus isolation.
 - Immunization of birds in non-infected houses and those in the early stages of the disease in consultation with a poultry veterinarian may be indicated.
 - Assess the risk of virus spread to adjacent farms according to the type of poultry operation.
 - Employ the guidelines as set out in this document for the appropriate operation.
 - If the status in the high risk zone is positive, the status of the next 3 km radius of the low risk zone will be assessed.

4. Immunization

- Immunization will only be carried out in a selective, controlled way and at this stage general vaccination is not indicated. Any vaccine used would have to be matched with the subtype of virus causing the outbreak.
- An AI vaccine is currently registered for use in poultry in South Africa, but permission has to be obtained from the Directorate of Animal Health (DAH) for the use of a vaccine.
- The veterinarian in charge of the health of the poultry flock(s) has to apply for permission from the DAH (Contact Dr. Carine Pienaar, telephone number 012 319 7637) for permission to obtain the vaccine. Copies of these letters have to be submitted to the vaccine depot in order to obtain the vaccine.

5. A compulsory 6 monthly NAI survey is, since 2005, carried out in the country in all commercial chickens and commercial ostriches, as well as non-commercial chickens. This includes testing for the H5 and H7 subtypes, but in chickens that are not vaccinated against LPAI, the ELISA test could be used, which would also test for LPAI subtypes. Emu birds have been included in the NAI survey as well.
6. State veterinarians and private veterinarians should be on the look-out for the following signs in poultry flocks that could indicate possible action for the confirmation of an outbreak.
 - white shelled eggs, associated with sudden egg production drops
 - upper respiratory tract infections (broilers)
 - increased mortality (broilers)
7. Suspected outbreaks may be discussed by owners and/or veterinarians with the Poultry Group of the South African Veterinary Association, SAPA or the National Directorate Animal Health for guidance on control and related measures. For contact numbers, phone SAPA at (011) 795 2051.

APPENDIX 4

CONTROL CENTRE MANAGEMENT

1. INTRODUCTION

- After the confirmation of an exotic disease outbreak, the Provincial Director will establish a Disease Control Centre without delay.
- The Control Centre must be established as close as practical to the disease outbreak, taking into account the nature of the disease and the availability of accommodation, communication links etc.
- The appointment of persons to positions in the Control Centre should be confirmed in writing as soon as possible and a full job description supplied to such persons.
- The Disease Control Centre must also be as close to the site of the Joint Operations Control Centre as possible in order to facilitate communications between the two bodies.
- Instructions/inputs from any person outside the appointed members of the Disease Control Centre, **MUST** be submitted to the Disease Control Officer in writing

2. PREMISES

- Premises should be sought that will enable all members of the control centre to be accommodated within one building, or as close together as possible.
- The premises must also allow sufficient parking for staff and members of the public.
- The internal office space of the control centre should be organized so that members of the public have easy access to those sections that they need, i.e. the permit section should be at the entrance to the control centre. Access to the rest of the control centre must be limited to official staff only. Access control by means of easily identifiable badges must be applied.
- A room for media liaison and press conferences would also be of value. This could also be used for staff briefings and meetings of the Veterinary Committee.
- Provinces should identify possible venues for control centres in the province and maintain an up to date record of such venues. Departmental offices should be utilized if possible, otherwise other Departments or outside bodies (i.e. farmers associations, private firms) should be approached. Such a register should form part of the Provinces Standard Operational Procedure Manual. Liaison with the provincial Disaster Management Unit may also assist in identifying suitable premises.

3. EQUIPMENT NEEDED

- 4 Telkom lines with toll free number
- At least one dedicated fax line (2 if possible)
- Computers and network access (including internet access)
- At least one photostat machine
- Office furniture for each official as required
- Filing cabinets as needed
- Map boards
- Whiteboards and markers
- Each province should identify the equipment needed and also maintain a register of the availability of such equipment from Departmental and other sources. This should form part of the Provinces contingency Plan
- Each Province must also maintain links with the IT component and Telkom to ensure immediate installation of equipment

4. STRUCTURE

The structure of the Control Centre Management is shown in Annexure A.
A full job description of all senior posts is given in point 5 below.

- The number of staff needed will have to be assessed according to the size and location of the disease outbreak.
- The provincial Director will identify persons with the required competencies for the Control Centre Posts.
- A Veterinary Committee will be established as described below.

4.1 Veterinary Committee (VETCOM)

4.1.1 Structure

- The Standing Veterinary Committee shall consist of the following officials.
- The Disease Control Officer (DCO)
- The Disease Manager (DM) (Chairman)
- The Field Operations Manager (FOM)
- The Technical Field Officer (TFO)
- The Movement Control Manager (MCO)
- The Epidemiologist (EPI)
- Administration Manager (AM)
- Head Communication Division (COM)
- Legal Advisor (LA)
- National Liaison Officer (NLO)
- Disease manager Secretary (Secretary)

Other officials may be co-opted onto the committee at any time and for any period as deemed necessary by the committee.

4.1.2 Functions

- The Veterinary Committee will discuss disease control policy and make recommendations to the Disease Control Officer.
- The Committee will also evaluate existing disease control measures and make amendments according to the disease situation.
- The committee will receive report backs from all sections and evaluate such reports.
- The committee will also direct the surveillance and control planning process.
- The minutes of the committee meetings will form part of the disease control policy document.
- The committee will meet on a daily basis at the beginning of an outbreak, however depending on circumstances the interval may be extended to every second day or as decided by the committee members.
- The Disease Control Officer and the Disease Manager will represent Veterinary Services at the Joint Operational Control Centre (JOCC) meetings.
- The committee will also approve any press release, or report before it is published.

5. DUTIES OF SENIOR OFFICERS IN CONTROL CENTRE

5.1 The Disease Control Officer (DCO)

The Disease Control Officer would normally be the Director of the affected Province, however any Veterinarian with suitable qualifications could be appointed.

Line Relationships

- Reports to the National Director Animal Health on disease control POLICY matters.
- Reports to the Provincial HOD and MEC on policy and disease control situation
- Liaise with other Provincial Directors

Duties

- **Overall control of disease outbreak**
- Ensures that National disease control policy is carried out
- Acts as Chairman of the JOC and liaises with all other role players
- Oversees the establishment of the Disease Control Centre
- Appoints officers to posts in the Disease Control Centre
- Liaison with National Directorate and the submission of reports and updates as required
- Maintain control over allocated funds
- Ensures that Provincial HOD and MEC are informed on all aspects of the control operation.
- Maintains control over personnel deployment

- Acts as Liaison with other Provincial Veterinary Services
- Recommends changes in policy to the National Directorate
- Liaison with other Departments within the Province for personnel secondment or equipment loan

5.2 Disease Manager (DM)

Responsible for the day-to-day operation of the Control Centre. Needs to be a Veterinarian with good management skills and advanced knowledge of disease control procedures

Line Relationships

- Appointed by DCO
- Reports directly to the Disease Control Officer

Duties

- Deputizes for the DCO in his/her absence
- Acts as support for DCO
- Chairman of Veterinary Committee
- Liaises with all section managers on a daily basis
- Co ordinates activities between sections
- Acts as liaison with organized Agriculture
- Reports on daily activities to the JOC meeting
- To advise the DCO on field activities
- To ensure full and transparent briefing of the media section
- Ensures that all changes to disease control operations are communicated to all section managers
- To make decisions on disease control strategies in emergency situations
- To collate all unit reports into a consolidated daily situation report and submit same to the DCO

NOTE: In cases of limited and smaller disease outbreaks one officer could handle both the DCO and the DM duties. This principle can also be applied to other management posts as well. It will be the decision of the Provincial Director as to which posts are filled, taking into consideration the size of the outbreak and the disease involved.

5.3 Field Operations Manager (FOM)

This officer needs to be a Veterinarian with extensive field and management experience. Advanced knowledge of epidemiology and exotic diseases and their control would be recommended.

Line Relationships

- Appointed by the DCO
- The officer reports directly to the Disease Manager
- The officer also works in close cooperation with the Field Operations Officer

Duties

- Responsible for the management of the following sections:
 - Surveillance unit
 - Vaccination unit
 - Infected Zone unit
 - Pounds and stray animal unit
- Deputizes for the DM in his/her absence
- Responsible for the day to day functioning of his section
- Responsible for the planning, execution and control of all field activities
- To determine in close liaison with the Field Operations officer the personnel requirements for field activities.
- To ensure that all field operations are correctly planned and carried out
- To monitor the work performed and to make amendments to such plans as needed
- To receive all field reports and to generate a combined report for submission to the VetCom on a daily basis
- To liaise with the Epidemiology unit and ensure that all maps/data that are required for the field teams are available
- To control field reports and ensure their completeness and accuracy before submission to the Epidemiology unit
- To brief all staff on a regular basis on the progress of the campaign.
- Signage

5.4 Technical Field Officer (TFO)

The officer needs to be a senior Animal Health Technician will extensive field and management experience. Experience in personnel and transport management would be an advantage.

Line Relationships

The officer reports to the Field Operations Manager. These two officers will have to work very closely together to ensure smooth running of the field operations. They must be based together.

Duties

- Responsible for technical staff
- To plan the deployment of staff with the FOM
- To ensure that all field teams have all necessary equipment and suitable transport and means of communication.
- To coordinate all technical field activities including the appointment of supervisors to ensure the most economical use of resources

- To follow up on complaints and problems and to report the same to the FOM
- To receive all field visit forms and check them for accuracy.
- To maintain a register of all staff active in the field
- To arrange and control accommodation for visiting staff
- To check and control all monthly returns, log sheets, S & T and overtime claims before submission to Administration section
- To maintain a register of all costs incurred in field operations
- To submit daily report to FOM on field activities and problems encountered
- Member of VetCom
- To ensure that all new staff are fully briefed before starting work

5.5 Movement Control Manager (MCM)

This officer needs to be a senior veterinarian with extensive experience in permit control and personnel management and dealing with the public. To be assisted by Senior technician with extensive field experience of movement control

Line Relationships

This officer reports directly to the Disease Manager

Duties

- Responsible for the management of the following sections
 - Permit Control
 - Road Blocks and cordon control
- To ensure that all movement protocols are enforced
- To draw up amendments to movement protocols after policy changes
- To liaise with organized agriculture re permit control
- To liaise with the general public re movement control
- To ensure that public and farmers have easy access to permit control office i.e. phone/fax or email
- To liaise with the Geographical Information System (GIS) Section (in Epidemiology Unit), as well as with the Road Traffic Department (RTD) and South African National Defence Force (SANDF) about the best place to place road blocks
- To regularly inform, in writing, all technical and regulatory personnel about the poultry and poultry products allowed in and out (movement protocols and latest editions thereof)
- To advise on correct disinfection (methods and disinfectants) of vehicles and people at road blocks
- To control the permit inspection teams and the issuing of permits in surrounding areas via the local SV offices
- To monitor the issuing of permits and to report tendencies/problems to the VetCom
- Member of the VetCom
- To ensure that all roadblocks have the essential equipment needed and to monitor the functioning of roadblocks.
- To liaise with other Security Services in regard to road blocks

- To report any irregularities in road blocks and movement control immediately to the DM
- To investigate illegal movements and to institute legal proceedings if necessary
- To determine the personnel needs of his section (assistance from the TFO)

5.6 Epidemiologist (EPI)

This officer needs to be a veterinarian with a postgraduate degree in epidemiology. Experience of exotic disease control would be a recommendation.

Line relationship

The officer reports to the Disease Manager

Duties

- Member of VetCom
- To establish an Epidemiology Unit, if necessary
- To maintain central database of all field data and to produce statistical reports as required by management, National and International organizations
- To assist the FOM in the statistical planning of surveillance and control operations
- To conduct epidemiological disease investigations, including backward and forward tracing as well as source of the outbreak, and make recommendations to the DM
- To analyse data collected and make recommendations to VetCom
- To determine personnel needs of section and submit needs to administration
- To produce maps as required by field operations
- To produce maps of disease control operations
- To ensure the correctness of data collected by field teams

5.7 Administration Manager

The officer needs to be a senior administration official with extensive experience in all aspects of government administrative procedures.

Line Relationships

The officer reports directly to the Disease Manager

Duties

- Member of VetCom
- Responsible for management of following sections
 - Logistics (including procurement)
 - Stores
 - Personnel administration
 - Financial control

- To control the procurement of necessary stores and equipment (including “Keep Out” and “Quarantine Area” signs)
- To ensure the safe storage of stocks and equipment
- To appoint a responsible store keeper and monitor issues and returns
- To determine with section managers the personnel requirements
- To arrange the secondment of personnel from other Departments and Provinces as required.
- To arrange accommodation for seconded staff
- To control and monitor claims from staff members
- To maintain register of expenses for disease control campaign and to submit regular reports on expenditure to DM
- To request extra funds as needed
- To ensure that all administrative procedures and rules are complied with
- To assist the DM in compilation of financial reports and budgets

5.8 Communications Manager

This officer needs to be a person with extensive experience in public relations and media liaison. A working knowledge of animal diseases and the structure and functioning of Veterinary Services would be a recommendation.

Line Relationships

This officer reports directly to the Disease Manager

Duties

- Member of VetCom
- Act as media spokesperson for the Disease Control Centre
- Responsible for the preparation of daily media releases
- Liaison with all media bodies
- Prepares informal reports and update for internal circulation
- Ensures the daily updating of the Disease Control website
- Coordinates extension efforts to farmers and public
- Prepares training aids for staff training and extension (booklets, posters, info packs, videos etc.)
- Assists with preparation of Minister’s speeches, Cabinet Memorandum etc.
- Monitors press and records all articles relevant to disease control
- Arranges visits for press to infected areas/control operations

5.9 Legal Advisor

This officers needs to have an extensive knowledge of appropriate legislation and knowledge of animal disease control would be an advantage

Line Relationship

This officer reports directly to the Disease Control Manager

Duties

- Member of VetCom

- Examines all decisions and control measures proposed and advises on the legality of such measures.
- Responsible for Preparation and submission of Orders, notices etc for signature by Minister.
- To ensure that all disease control actions are carried out in terms of the appropriate legislation

5.10 Secretary to DCO

This officer needs to have experience in dealing with members of the public, computer skills and general secretarial experience

Line Relationship

The officer reports directly to the Disease Control Officer

Duties

- Provide secretarial support to the DCO
- Maintain diary of appointments for DCO
- To deal with queries from the public and relay such queries to the appropriate section manager
- To maintain register of telephonic messages and ensure the follow up on such messages
- To prepare and type reports, letters or presentations for the DCO
- To send and receive fax/email messages for the DCO
- To assist in the overall control and management of the disease control centre

5.11 Secretary to DM

This officer needs to have experience in dealing with members of the public, computer skills and general secretarial experience

Line Relationship

The officer reports directly to the Disease Manager

Duties

- Provide secretarial support to the DM
- Maintain diary of appointments for DM
- To prepare agenda for and take minutes of the VetCom meetings
- To arrange suitable venues for regular or ad hoc meetings
- To deal with queries from the public and relay such queries to the appropriate section manager
- To maintain register of telephonic messages and ensure the follow up on such messages
- To prepare and type reports, letters presentations for the DM
- To send and receive fax/email messages for the DM
- To assist in the overall control and management of the disease control centre

5.12 National Liaison Officer

This officer will be a senior official appointed by the National Minister of Agriculture and will act as the only liaison between the Disease control Centre Management and the National Department.

Line Relationship

- This Officer reports directly to the National Department.
- He/she will operate in close conjunction with the Disease Control Office in the Province
- This office will have immediate access to all disease control actions and data collected.

Duties

- Member of Vetcom
- Daily Liaison with the Disease Control Officer
- To report to National Department on at least a daily basis.
- To supply National Department with any other information required.
- To prepare and submit to National Department any press releases needed on National basis.
- To be responsible for all communications between the National Department and the Disease Control Centre
- On request of the Disease Control Officer to submit requirements for extra personnel, finances or other assistance needed for the Disease Control Operation

APPENDIX 5

CONTINGENCY PLAN

- Establish Veterinary Task Force – prepare emergency control and response plans involving other agencies e.g. PH, Army, Police etc
- Develop emergency preparedness programme to prevent the establishment of infection or re-infection.
- A zoning approach to expand free areas whilst driving the disease into smaller areas.
- Regional Laboratory network – reagent production and sharing.
- Educational materials for biosecurity and public health
- Media control
- International reporting standards, OIE etc
- Poultry population divided into three parts – large commercial, small commercial and village/pet/backyard.
- Resources available to conduct epidemiological assessment of the outbreak.
- Molecular capability and analysis, sequencing of isolates.
- Support for research on disease transmission.
- Sources of vaccines for different subtypes, if applicable.

The two fundamental components of animal disease emergency preparedness planning are the development of capabilities for:

- early warning, and
- early reaction to disease epidemics and other animal health emergencies.

These require advance preparation of both generic and disease-specific written contingency plans and operating procedures, the testing of such plans and training of staff; the development of capabilities at national, provincial and local veterinary headquarters, including field and laboratory services; development of mechanisms to involve other necessary government and private sector services and farming communities in the emergency response; development of the capacity to apply all the necessary resources to counter the disease or other animal health emergency in the most efficient way (including equipment, personnel and finances); and, finally, advance establishment of the appropriate legal and administrative structures to deal with an emergency.

Early warning of disease

Early warning enables rapid detection of the introduction of, or sudden increase in, the incidence of any disease of livestock which has the potential of developing to epidemic proportions and/or causing serious socio-economic consequences or public health concerns. It embraces all initiatives, mainly based on disease surveillance, reporting and epidemiological analysis that would lead to improved awareness and knowledge of the distribution and behaviour of disease outbreaks (and of infection) and which allow forecasting of the source and evolution of the disease outbreaks and the monitoring of the effectiveness of disease control campaigns.

The success of a country's capability for rapid detection of the introduction or increased incidence of transboundary and potentially epidemic animal diseases depends on:

- good farmer and public awareness programmes for high-threat epidemic livestock diseases that involve improving the veterinary/farmer interface;
- training of field veterinary officers and veterinary auxiliary staff in the clinical and gross pathological recognition of serious epidemic livestock diseases; collection and transportation of diagnostic specimens; and the need for prompt action;
- sustained active disease surveillance to supplement passive monitoring, based on close coordination between field and laboratory/epidemiology veterinary services, and use of techniques such as participatory questionnaires, serological surveys and abattoir monitoring to supplement field searching for clinical disease;
- establishment of reliable livestock identification systems for enhancement of disease-tracing capabilities;
- dependable emergency disease-reporting mechanisms to regional and/or national/veterinary headquarters;
- implementation of an emergency disease information system;
- enhancement of laboratory diagnostic capabilities for priority diseases within provincial and national veterinary laboratories;
- development of strong linkages between national laboratories and regional and world reference laboratories, including the routine submission of specimens for specialized antigenic and genetic characterization of disease-causing agents;
- strengthening of national epidemiological capabilities to support emergency preparedness and disease management strategies;
- prompt and comprehensive international disease reporting to OIE and neighbouring countries, etc.;
- inclusion of early warning in contingency planning for livestock disease epidemics.

Early reaction to disease outbreaks

Early reaction means carrying out without delay the disease control activities needed to contain the outbreak and then to eliminate the disease and infection in the shortest possible time and in the most cost-effective way, or at least to return to the status quo and to provide objective, scientific evidence that one of these objectives has been attained.

For this to be achieved, the following elements need to be in place:

- development of national emergency disease contingency plans, both generic and for specific identified high-risk diseases, which should be established, tested and refined through simulation exercises;
- establishment of a national animal disease emergency planning committee;
- establishment of a consultative committee on emergency animal diseases (or a national animal disease emergency task force) charged with the responsibility of implementing the national animal disease emergency plans;
- installation of diagnostic capabilities for all high-threat diseases. These should be fully developed and tested in national and, where appropriate, provincial diagnostic laboratories and linkages established with world and regional reference laboratories;
- ensured arrangements for involvement of the private sector (e.g. livestock farmers' organizations, veterinary practitioners, livestock traders, commercial farming companies, animal product processors and exporters);

- arrangement for epidemic livestock diseases to be included in national disaster plans so that the police, army and other services can be involved as and when necessary;
- preparation of legislative and administrative frameworks to permit all necessary disease control actions to be implemented without delay;
- arrangements whereby funding for disease control campaigns can be quickly provided;
- ensuring that veterinary services are structured in such a way as to facilitate disease reporting and implementation of a nationally coordinated disease control/eradication campaign without delay during an emergency;
- provision of trained personnel and other necessary resources;
- compensation arrangements whereby farmers or others can be paid fair and quick compensation for any animals or other property destroyed as part of a disease control campaign;
- ensured access to quality-assured vaccines (containing the appropriate antigenic strain(s)), if applicable, through a vaccine bank or from other sources;
- harmonization of disease control programmes and cooperation with neighbouring countries to ensure a regional approach;
- determination of the available international agencies involved in epidemic disease control/containment, including FAO/ EMPRES, which could provide early reaction assistance if needed and establishment of regular communication channels with such organizations.

APPENDIX 6**NECESSARY EQUIPMENT TO BE KEPT IN STOCK AT ALL TIMES, AND IN SUFFICIENT AMOUNTS****1. KEPT BY PROVINCIAL VETERINARY SERVICES**

- Spades
- Picks
- Crowbars
- Fencing pliers
- Wire strainers
- Hammer (15 pds)
- Soil stamping rods

1.1 Camping equipment:

- Torches and batteries
- Gas lamps and candles
- Gas bottles and gas
- Lanterns and paraffin
- Neon lights (12V)
- Tents
- Beds and mattresses
- Emergency aid kits
- Malaria drugs (if Province is situated partly or wholly in a malaria area)
- Three-legged pots

1.2 Inspection and sample collection equipment:

- Fridges
- Hebcoolers
- Dry ice containers
- Spoon
- Small table
- Chair

2. KEPT BY ALL PROVINCIAL OFFICIALS**2.1 Clothing:**

- Overalls
- Boots
- Toiletries
- Bedding
- Cutlery
- Crockery
- Other personal items

APPENDIX 7

NOTIFIABLE AVIAN INFLUENZA OIE TERRESTRIAL ANIMAL HEALTH CODE

Terrestrial Animal Health Code

CHAPTER 10.4.

AVIAN INFLUENZA

Article 10.4.1.

General provisions

1. For the purposes of *international trade*, avian influenza in its notifiable form (NAI) is defined as an *infection* of poultry caused by any influenza A virus of the H5 or H7 subtypes or by any AI virus with an intravenous pathogenicity index (IVPI) greater than 1.2 (or as an alternative at least 75% mortality) as described below. NAI viruses can be divided into highly pathogenic notifiable avian influenza (HPNAI) and low pathogenicity notifiable avian influenza (LPNAI):
 - a. HPNAI viruses have an IVPI in 6-week-old chickens greater than 1.2 or, as an alternative, cause at least 75% mortality in 4-to 8-week-old chickens infected intravenously. H5 and H7 viruses which do not have an IVPI of greater than 1.2 or cause less than 75% mortality in an intravenous lethality test should be sequenced to determine whether multiple basic amino acids are present at the cleavage site of the haemagglutinin molecule (HA0); if the amino acid motif is similar to that observed for other HPNAI isolates, the isolate being tested should be considered as HPNAI;
 - b. LPNAI are all influenza A viruses of H5 and H7 subtype that are not HPNAI viruses.
2. Poultry is defined as ‘all domesticated birds, including backyard poultry, used for the production of meat or eggs for consumption, for the production of other commercial products, for restocking supplies of game, or for breeding these categories of birds, as well as fighting cocks used for any purpose’.

Birds that are kept in captivity for any reason other than those reasons referred to in the preceding paragraph, including those that are kept for shows, races, exhibitions, competitions or for breeding or selling these categories of birds as well as pet birds, are not considered to be poultry.

3. For the purposes of *international trade*, this chapter deals not only with the occurrence of clinical signs caused by NAI virus, but also with the presence of *infection* with NAI virus in the absence of clinical signs.
4. For the purposes of *international trade*, a Member should not impose immediate trade bans in response to a notification of *infection* with HPAI and LPAI virus in birds other than poultry according to Article 1.2.3. of the *Terrestrial Code*.
5. Antibodies to H5 or H7 subtype of NAI virus, which have been detected in poultry and are not a consequence of vaccination, have to be further investigated. In the case of isolated serological positive results, NAI infection may be ruled out on the basis of a thorough epidemiological investigation that does not demonstrate further evidence of NAI infection.
6. The following defines the occurrence of *infection* with NAI virus:
 - a. HPNAI virus has been isolated and identified as such or viral RNA specific for HPNAI has been detected in poultry or a product derived from poultry; or
 - b. LPNAI virus has been isolated and identified as such or viral RNA specific for LPNAI has been detected in poultry or a product derived from poultry.

For the purposes of the *Terrestrial Code*, 'NAI free establishment' means an *establishment* in which the poultry have shown no evidence of NAI infection, based on *surveillance* in accordance with Articles 10.4.27. to 10.4.33.

For the purposes of the *Terrestrial Code*, the *incubation period* for NAI shall be 21 days.

Standards for diagnostic tests, including pathogenicity testing, are described in the *Terrestrial Manual*. Any vaccine used should comply with the standards described in the *Terrestrial Manual*.

Article 10.4.2.

Determination of the NAI status of a country, zone or compartment

The NAI status of a country, a *zone* or a *compartment* can be determined on the basis of the following criteria:

1. NAI is notifiable in the whole country, an on-going NAI awareness programme is in place, and all notified suspect occurrences of NAI are subjected to field and, where applicable, *laboratory* investigations;
2. appropriate *surveillance* is in place to demonstrate the presence of *infection* in the absence of clinical signs in poultry, and the risk posed by birds other than poultry; this may be achieved through a NAI *surveillance* programme in accordance with Articles 10.4.27. to 10.4.33.;
3. consideration of all epidemiological factors for NAI occurrence and their historical perspective.

Article 10.4.3.

NAI free country, zone or compartment

A country, *zone* or *compartment* may be considered free from NAI when it has been shown that neither HPNAI nor LPNAI infection has been present in the country, *zone* or *compartment* for the past 12 months, based on *surveillance* in accordance with Articles 10.4.27. to 10.4.33.

If *infection* has occurred in a previously free country, *zone* or *compartment*, NAI free status can be regained:

1. In the case of HPNAI *infections*, 3 months after a *stamping-out policy* (including *disinfection* of all affected *establishments*) is applied, providing that *surveillance* in accordance with Articles 10.4.27. to 10.4.33. has been carried out during that three-month period.
2. In the case of LPNAI *infections*, poultry may be kept for *slaughter* for human consumption subject to conditions specified in Articles 10.4.20. or 10.4.21. or a *stamping-out policy* may be applied; in either case, 3 months after the *disinfection* of all affected *establishments*, providing that *surveillance* in accordance with Articles 10.4.27. to 10.4.33. has been carried out during that three-month period.

Article 10.4.4.

HPNAI free country, zone or compartment

A country, *zone* or *compartment* may be considered free from HPNAI when:

1. it has been shown that HPNAI infection has not been present in the country, *zone* or *compartment* for the past 12 months, although its LPNAI status may be unknown; or
2. when, based on *surveillance* in accordance with Articles 10.4.27. to 10.4.33., it does not meet the criteria for freedom from NAI but any NAI virus detected has not been identified as HPNAI virus.

The *surveillance* may need to be adapted to parts of the country or existing *zones* or *compartments* depending on historical or geographical factors, industry structure, population data, or proximity to recent *outbreaks*.

If *infection* has occurred in a previously free country, *zone* or *compartment*, HPNAI free status can be regained 3 months after a *stamping-out policy* (including *disinfection* of all affected *establishments*) is applied, providing that *surveillance* in accordance with Articles 10.4.27. to 10.4.33. has been carried out during that three-month period.

Article 10.4.5.

Recommendations for importation from a NAI free country, zone or compartment

for live poultry (other than day-old poultry)

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that:

1. the poultry showed no clinical sign of NAI on the day of shipment;
2. the poultry were kept in a NAI free country, *zone* or *compartment* since they were hatched or for at least the past 21 days;
3. the required *surveillance*, in accordance with Articles 10.4.27. to 10.4.33., has been carried out on the *establishment* within at least the past 21 days;
4. if vaccinated, the poultry have been vaccinated in accordance with Articles 10.4.27. to 10.4.33.; in that case, the nature of the vaccine used and the date of vaccination should be attached to the *certificate*.

Article 10.4.6.

Recommendations for the importation of live birds other than poultry

Regardless of the NAI status of the country, *zone* or *compartment* of origin, *Veterinary Authorities* should require the presentation of an *international veterinary certificate* attesting that:

1. the birds showed no clinical sign of *infection* with a virus which would be considered NAI in poultry on the day of shipment;
2. the birds were kept in isolation approved by the *Veterinary Services* since they were hatched or for at least the 21 days prior to shipment and showed no clinical sign of *infection* with a virus which would be considered NAI in poultry during the isolation period;
3. the birds were subjected to a diagnostic test within 14 days prior to shipment to demonstrate freedom from *infection* with a virus which would be considered NAI in poultry;
4. the birds are transported in new or appropriately sanitized *containers*.

If the birds have been vaccinated, the nature of the vaccine used and the date of vaccination should be attached to the *certificate*.

Article 10.4.7.

Recommendations for importation from a NAI free country, zone or compartment

for day-old live poultry

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that:

1. the poultry were kept in a NAI free country, *zone* or *compartment* since they were hatched;
2. the poultry were derived from parent *flocks* which had been kept in a NAI free country, *zone* or *compartment* for at least 21 days prior to and at the time of the collection of the eggs;
3. if the poultry or the parent *flocks* were vaccinated, vaccination was carried out in accordance with Articles 10.4.27. to 10.4.33.; in that case, the nature of the vaccine used and the date of vaccination should be attached to the *certificate*.

Article 10.4.8.

Recommendations for importation from a HPNAI free country, zone or compartmentfor day-old live poultry

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. the poultry were kept in a HPNAI free country, zone or compartment since they were hatched;
2. the poultry were derived from parent flocks which had been kept in a NAI free establishment for at least 21 days prior to and at the time of the collection of the eggs;
3. the poultry are transported in new or appropriately sanitized containers;
4. if the poultry or the parent flocks were vaccinated, vaccination was carried out in accordance with Articles 10.4.27. to 10.4.33.; in that case, the nature of the vaccine used and the date of vaccination should be attached to the certificate.

Article 10.4.9.

Recommendations for the importation of day-old live birds other than poultry

Regardless of the NAI status of the country, zone or compartment, Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. the birds showed no clinical signs suggestive of NAI on the day of shipment;
2. the birds were hatched and kept in isolation approved by the Veterinary Services;
3. the parent flock birds were subjected to a diagnostic test at the time of the collection of the eggs to demonstrate freedom from infection with NAIV;
4. the birds are transported in new or appropriately sanitized containers.

If the birds or parent flocks were vaccinated against NAI, the nature of the vaccine used and the date of vaccination should be attached to the certificate.

Article 10.4.10.

Recommendations for importation from a NAI free country, zone or compartmentfor hatching eggs of poultry

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. the eggs came from a NAI free country, zone or compartment;
2. the eggs were derived from parent flocks which had been kept in a NAI free country, zone or compartment for at least 21 days prior to and at the time of the collection of the eggs;
3. if the parent flocks were vaccinated, vaccination was carried out in accordance with Articles 10.4.27. to 10.4.33.; in that case, the nature of the vaccine used and the date of vaccination should be attached to the certificate;
4. the eggs are transported in new or appropriately sanitized containers.

Article 10.4.11.

Recommendations for importation from a HPNAI free country, zone or compartment

for hatching eggs of poultry

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. the eggs came from a HPNAI free country, zone or compartment;
2. the eggs were derived from parent flocks which had been kept in a NAI free establishment for at least 21 days prior to and at the time of the collection of the eggs;
3. the eggs have had their surfaces sanitised (in accordance with Chapter 6.3.) and are transported in new packing material;
4. if the parent flocks were vaccinated, vaccination was carried out in accordance with Articles 10.4.27. to 10.4.33.; in that case, the nature of the vaccine used and the date of vaccination should be attached to the certificate.

Article 10.4.12.

Recommendations for the importation of hatching eggs from birds other than poultry

Regardless of the NAI status of the country, zone or compartment origin, Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. the parent flock birds were subjected to a diagnostic test 7 days prior to and at the time of the collection of the eggs to demonstrate freedom from infection with NAIV;
2. the eggs have had their surfaces sanitized (in accordance with Chapter 6.3.) and are transported in new or appropriately sanitized packing material;
3. the parent flocks have not been vaccinated against NAI; if parent flocks were vaccinated against NAI, the nature of the vaccine used and the date of vaccination should also be attached to the certificate.

Article 10.4.13.

Recommendations for importation from a NAI free country, zone or compartment

for eggs for human consumption

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. the eggs were produced and packed in a NAI free country, zone or compartment;
2. the eggs are transported in new or appropriately sanitized packaging material.

Article 10.4.14.

Recommendations for importation from a HPNAI free country, zone or compartment

for eggs for human consumption

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. the eggs were produced and packed in a HPNAI free country, zone or compartment;

2. the eggs have had their surfaces sanitized (in accordance with Chapter 6.3.) and are transported in new or appropriately sanitized packing material.

Article 10.4.15.

Recommendations for importation from a NAI free country, zone or compartment

for egg products

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the egg products come from, and were processed in, a NAI free country, zone or compartment.

Article 10.4.16.

Recommendations for importation from a country, zone or compartment not considered free from NAI

for egg products

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. the egg products are derived from eggs which meet the requirements of Articles 10.4.11. or 10.4.14.; or
2. the egg products were processed to ensure the destruction of NAI virus in accordance with Article 10.4.25.;
3. the necessary precautions were taken after processing to avoid contact of the commodity with any source of NAI virus;
4. the eggs are transported in new or appropriately sanitized packaging material.

Article 10.4.17.

Recommendations for importation from a NAI free country, zone or compartment

for poultry semen

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the donor poultry:

1. showed no clinical sign of NAI on the day of semen collection;
2. were kept in a NAI free country, zone or compartment for at least the 21 days prior to and at the time of semen collection.

Article 10.4.18.

Recommendations for the importation from a HPNAI free country, zone or compartment

for poultry semen

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the donor poultry:

1. showed no clinical sign of HPNAI on the day of semen collection;

2. were kept in a HPNAI free country, zone or compartment for at least the 21 days prior to and at the time of semen collection.

Article 10.4.19.

Recommendations for the importation of semen of birds other than poultry

Regardless of the NAI status of the country, zone or compartment of origin, Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the donor birds:

1. were kept in isolation approved by the Veterinary Services for at least the 21 days prior to semen collection;
2. showed no clinical sign of infection with a virus which would be considered NAI in poultry during the isolation period;
3. were tested within 14 days prior to semen collection and shown to be free of NAI infection.

Article 10.4.20.

Recommendations for importation from a NAI free country, zone or compartment

for fresh meat of poultry

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the entire consignment of fresh meat comes from poultry:

1. which have been kept in a NAI free country, zone or compartment since they were hatched or for at least the past 21 days;
2. which have been slaughtered in an approved abattoir in a NAI free country, zone or compartment and have been subjected to ante-mortem and post-mortem inspections in accordance with Chapter 6.2. and have been found free of any signs suggestive of NAI.

Article 10.4.21.

Recommendations for importation from a HPNAI free country, zone or compartment

for fresh meat of poultry

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the entire consignment of fresh meat comes from poultry:

1. which have been kept in a HPNAI free country, zone or compartment since they were hatched or for at least the past 21 days;
2. which have been slaughtered in an approved abattoir in a HPNAI free country, zone or compartment and have been subjected to ante-mortem and post-mortem inspections in accordance with Chapter 6.2. and have been found free of any signs suggestive of NAI.

Article 10.4.22.

Recommendations for the importation of meat products of poultry

Regardless of the NAI status of the country, zone or compartment of origin, Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. the commodity is derived from fresh meat which meet the requirements of Articles 10.4.20. or 10.4.21.; or
2. the commodity has been processed to ensure the destruction of avian influenza virus in accordance with Article 10.4.26.;
3. the necessary precautions were taken to avoid contact of the commodity with any source of NAI virus.

Article 10.4.23.

Recommendations for the importation of products of poultry origin intended for use in animal feeding, or for agricultural or industrial use

Regardless of the NAI status of the country, zone or compartment of origin, Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. these commodities come from poultry which have been kept in a NAI free country, zone or compartment since they were hatched or for at least the past 21 days; or
2. these commodities have been processed to ensure the destruction of avian influenza virus (under study);
3. the necessary precautions were taken to avoid contact of the commodity with any source of NAI virus.

Article 10.4.24.

Recommendations for the importation of feathers and down of poultry

Regardless of the NAI status of the country, zone or compartment of origin, Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. these commodities come from poultry which have been kept and processed in a NAI free country, zone or compartment since they were hatched or for at least the past 21 days; or
2. these commodities have been processed to ensure the destruction of avian influenza virus (under study);
3. the necessary precautions were taken to avoid contact of the commodity with any source of avian influenza virus.

Article 10.4.25.

Procedures for the inactivation of the AI virus in eggs and egg products

	Temperature (°C) Time	
Whole egg	60	188 seconds
Whole egg blends	60	188 seconds
Whole egg blends	61.1	94 seconds
Liquid egg white	55.6	870 seconds
Liquid egg white	56.7	232 seconds
10% salted yolk	62.2	138 seconds
Dried egg white	67	0.83 days
Dried egg white	54.4	21.38 days

The listed temperatures are indicative of a range that achieves a 7-log kill. Where scientifically documented, variances from these times and temperatures may also be suitable when they achieve the inactivation of the virus.

Article 10.4.26.

Procedures for the inactivation of the AI virus in meat

A procedure which produces a core temperature of 70°C for 3.5 seconds is suitable for the inactivation of HPNAI virus present in meat.

	Temperature (°C)	Time
Poultry meat	60.0	507 seconds
	65.0	42 seconds
	70.0	3.5 seconds
	73.9	0.51 seconds

Article 10.4.27.

Surveillance: introduction

Articles 10.4.27. to 10.4.33. define the principles and provide a guide on the surveillance of NAI complementary to Chapter 1.4., applicable to Members seeking to determine their NAI status. This may be for the entire country, zone or compartment. Guidance for Members seeking free status following an outbreak and for the maintenance of NAI status is also provided.

The presence of avian influenza viruses in wild birds creates a particular problem. In essence, no Member can declare itself free from avian influenza (AI) in wild birds. However, the definition of NAI in this Chapter refers to the infection in poultry only, and Articles 10.4.27. to 10.4.33. were developed under this definition.

The impact and epidemiology of NAI differ widely in different regions of the world and therefore it is impossible to provide specific recommendations for all situations. It is axiomatic that

the surveillance strategies employed for demonstrating freedom from NAI at an acceptable level of confidence will need to be adapted to the local situation. Variables such as the frequency of contacts of poultry with wild birds, different biosecurity levels and production systems and the commingling of different susceptible species including domestic waterfowl require specific surveillance strategies to address each specific situation. It is incumbent upon the Member to provide scientific data that explains the epidemiology of NAI in the region concerned and also demonstrates how all the risk factors are managed. There is therefore considerable latitude available to Members to provide a well-reasoned argument to prove that absence of NAI virus (NAIV) infection is assured at an acceptable level of confidence.

Surveillance for NAI should be in the form of a continuing programme designed to establish that the country, zone or compartment, for which application is made, is free from NAIV infection.

Article 10.4.28.

Surveillance: general conditions and methods

1. A surveillance system in accordance with Chapter 1.4. should be under the responsibility of the Veterinary Authority. In particular:
 - a. a formal and ongoing system for detecting and investigating outbreaks of disease or NAI infection should be in place;
 - b. a procedure should be in place for the rapid collection and transport of samples from suspect cases of NAI to a laboratory for NAI diagnosis as described in the Terrestrial Manual;

- c. a system for recording, managing and analysing diagnostic and surveillance data should be in place.
2. The NAI surveillance programme should:
- include an early warning system throughout the production, marketing and processing chain for reporting suspicious cases. Farmers and workers, who have day-to-day contact with poultry, as well as diagnosticians, should report promptly any suspicion of NAI to the Veterinary Authority. They should be supported directly or indirectly (e.g. through private veterinarians or veterinary para-professionals) by government information programmes and the Veterinary Authority. All suspected cases of NAI should be investigated immediately. As suspicion cannot be resolved by epidemiological and clinical investigation alone, samples should be taken and submitted to a laboratory for appropriate tests. This requires that sampling kits and other equipment are available for those responsible for surveillance. Personnel responsible for surveillance should be able to call for assistance from a team with expertise in NAI diagnosis and control. In cases where potential public health implications are suspected, notification to the appropriate public health authorities is essential;
 - implement, when relevant, regular and frequent clinical inspection, serological and virological testing of high-risk groups of animals, such as those adjacent to a NAI infected country, zone or compartment, places where birds and poultry of different origins are mixed, such as live bird markets, poultry in close proximity to waterfowl or other sources of NAIV.

An effective surveillance system will periodically identify suspicious cases that require follow-up and investigation to confirm or exclude that the cause of the condition is NAIV. The rate at which such suspicious cases are likely to occur will differ between epidemiological situations and cannot therefore be predicted reliably. Applications for freedom from NAIV infection should, in consequence, provide details of the occurrence of suspicious cases and how they were investigated and dealt with. This should include the results of laboratory testing and the control measures to which the animals concerned were subjected during the investigation (quarantine, movement stand-still orders, etc.).

Article 10.4.29.

Surveillance strategies

1. Introduction

The target population for surveillance aimed at identification of disease and infection should cover all the susceptible poultry species within the country, zone or compartment. Active and passive surveillance for NAI should be ongoing. The frequency of active surveillance should be at least every 6 months. Surveillance should be composed of random and targeted approaches using virological, serological and clinical methods.

The strategy employed may be based on randomised sampling requiring surveillance consistent with demonstrating the absence of NAIV infection at an acceptable level of confidence. The frequency of sampling should be dependent on the epidemiological situation. Random surveillance is conducted using serological tests described in the Terrestrial Manual. Positive serological results should be followed up with virological methods.

Targeted surveillance (e.g. based on the increased likelihood of infection in particular localities or species) may be an appropriate strategy. Virological and serological methods should be used concurrently to define the NAI status of high risk populations.

A Member should justify the surveillance strategy chosen as adequate to detect the presence of NAIV infection in accordance with Chapter 1.4. and the prevailing epidemiological situation, including cases of HPNAI detected in any birds. It may, for example, be appropriate to target clinical surveillance at particular species likely to exhibit clear clinical signs (e.g. chickens). Similarly, virological and serological testing could be targeted to species that may not show clinical signs (e.g. ducks).

If a Member wishes to declare freedom from NAIV infection in a specific zone or compartment, the design of the survey and the basis for the sampling process would need to be aimed at the population within the zone or compartment.

For random surveys, the design of the sampling strategy will need to incorporate epidemiologically appropriate design prevalence. The sample size selected for testing will need to be large enough to detect infection if it were to occur at a predetermined minimum rate. The sample size and expected disease prevalence determine the level of confidence in the results of the survey. The Member must justify the choice of design prevalence and confidence level based on the objectives of surveillance and the epidemiological situation, in accordance with Chapter 1.4. Selection of the design prevalence in particular clearly needs to be based on the prevailing or historical epidemiological situation.

Irrespective of the survey approach selected, the sensitivity and specificity of the diagnostic tests employed are key factors in the design, sample size determination and interpretation of the results obtained. Ideally, the sensitivity and specificity of the tests used should be validated for the vaccination/infection history and the different species in the target population.

Irrespective of the testing system employed, surveillance system design should anticipate the occurrence of false positive reactions. If the characteristics of the testing system are known, the rate at which these false positives are likely to occur can be calculated in advance. There needs to be an effective procedure for following up positives to ultimately determine with a high level of confidence, whether they are indicative of infection or not. This should involve both supplementary tests and follow-up investigation to collect diagnostic material from the original sampling unit as well as flocks which may be epidemiologically linked to it.

The principles involved in surveillance for disease/infection are technically well defined. The design of surveillance programmes to prove the absence of NAIV infection/circulation needs to be carefully followed to avoid producing results that are either insufficiently reliable, or excessively costly and logistically complicated. The design of any surveillance programme, therefore, requires inputs from professionals competent and experienced in this field.

2. Clinical surveillance

Clinical surveillance aims at the detection of clinical signs of NAI at the flock level. Whereas significant emphasis is placed on the diagnostic value of mass serological screening, surveillance based on clinical inspection should not be underrated. Monitoring of production parameters, such as increased mortality, reduced feed and water consumption, presence of clinical signs of a respiratory disease or a drop in egg production, is important for the early detection of NAIV infection. In some cases, the only indication of LPNAIV infection may be a drop in feed consumption or egg production.

Clinical surveillance and laboratory testing should always be applied in series to clarify the status of NAI suspects detected by either of these complementary diagnostic approaches. Laboratory testing may confirm clinical suspicion, while clinical surveillance may contribute to confirmation of positive serology. Any sampling unit within which suspicious animals are detected should be classified as infected until evidence to the contrary is produced.

Identification of suspect flocks is vital to the identification of sources of NAIV and to enable the molecular, antigenic and other biological characteristics of the virus to be determined. It is essential that NAIV isolates are sent regularly to the regional Reference Laboratory for genetic and antigenic characterization.

3. Virological surveillance

Virological surveillance using tests described in the Terrestrial Manual should be conducted:

- a. to monitor at risk populations;
- b. to confirm clinically suspect cases;

- c. to follow up positive serological results;
 - d. to test 'normal' daily mortality, to ensure early detection of *infection* in the face of vaccination or in *establishments* epidemiologically linked to an *outbreak*.
4. Serological surveillance

Serological *surveillance* aims at the detection of antibodies against NAIV. Positive NAIV antibody test results can have four possible causes:

- a. natural *infection* with NAIV;
- b. vaccination against NAI;
- c. maternal antibodies derived from a vaccinated or infected parent *flock* are usually found in the yolk and can persist in progeny for up to 4 weeks;
- d. false positive results due to the lack of specificity of the test.

It may be possible to use serum collected for other survey purposes for NAI *surveillance*. However, the principles of survey design described in these recommendations and the requirement for a statistically valid survey for the presence of NAIV should not be compromised.

The discovery of clusters of seropositive *flocks* may reflect any of a series of events, including but not limited to the demographics of the population sampled, vaccinal exposure or *infection*. As clustering may signal *infection*, the investigation of all instances must be incorporated in the survey design. Clustering of positive *flocks* is always epidemiologically significant and therefore should be investigated.

If vaccination cannot be excluded as the cause of positive serological reactions, diagnostic methods to differentiate antibodies due to *infection* or vaccination should be employed.

The results of random or targeted serological surveys are important in providing reliable evidence that no NAIV infection is present in a country, *zone* or *compartment*. It is therefore essential that the survey be thoroughly documented.

5. Virological and serological surveillance in vaccinated populations

The *surveillance* strategy is dependent on the type of vaccine used. The protection against AI is haemagglutinin subtype specific. Therefore, two broad vaccination strategies exist: 1) inactivated whole AI viruses, and 2) haemagglutinin expression-based vaccines.

In the case of vaccinated populations, the *surveillance* strategy should be based on virological and/or serological methods and clinical *surveillance*. It may be appropriate to use sentinel birds for this purpose. These birds should be unvaccinated, AI virus antibody free birds and clearly and permanently identified. Sentinel birds should be used only if no appropriate *laboratory* procedures are available. The interpretation of serological results in the presence of vaccination is described in Article 10.4.33.

Article 10.4.30.

Documentation of NAI or HPNAI free status

1. Members declaring freedom from NAI or HPNAI for the country, zone or compartment: additional surveillance procedures

In addition to the general conditions described in above mentioned articles, a Member declaring freedom from NAI or HPNAI for the entire country, or a *zone* or a *compartment* should provide evidence for the existence of an effective *surveillance* programme. The strategy and design of the *surveillance* programme will depend on the prevailing epidemiological circumstances and should be planned and implemented according to general conditions and methods described in this Chapter, to demonstrate absence of NAIV or HPNAIV infection, during the preceding 12 months

in susceptible poultry populations (vaccinated and non-vaccinated). This requires the support of a laboratory able to undertake identification of NAI or HPNAI infection through virus detection and antibody tests described in the Terrestrial Manual. This surveillance may be targeted to poultry population at specific risks linked to the types of production, possible direct or indirect contact with wild birds, multi-age flocks, local trade patterns including live bird markets, use of possibly contaminated surface water, and the presence of more than one species on the holding and poor biosecurity measures in place.

2. Additional requirements for countries, zones or compartments that practise vaccination

Vaccination to prevent the transmission of HPNAI virus may be part of a disease control programme. The level of flock immunity required to prevent transmission will depend on the flock size, composition (e.g. species) and density of the susceptible poultry population. It is therefore impossible to be prescriptive. The vaccine must also comply with the provisions stipulated for NAI vaccines in the Terrestrial Manual. Based on the epidemiology of NAI in the country, zone or compartment, it may be that a decision is reached to vaccinate only certain species or other poultry subpopulations.

In all vaccinated flocks there is a need to perform virological and serological tests to ensure the absence of virus circulation. The use of sentinel poultry may provide further confidence of the absence of virus circulation. The tests have to be repeated at least every 6 months or at shorter intervals according to the risk in the country, zone or compartment.

Evidence to show the effectiveness of the vaccination programme should also be provided.

Article 10.4.31.

Countries, zones or compartments declaring that they have regained freedom from NAI or HPNAI following an outbreak: additional surveillance procedures

In addition to the general conditions described in the above-mentioned articles, a Member declaring that it has regained country, zone or compartment freedom from NAI or HPNAI virus infection should show evidence of an active surveillance programme depending on the epidemiological circumstances of the outbreak to demonstrate the absence of the infection. This will require surveillance incorporating virus detection and antibody tests described in the Terrestrial Manual. The use of sentinel birds may facilitate the interpretation of surveillance results.

A Member declaring freedom of country, zone or compartment after an outbreak of NAI or HPNAI (with or without vaccination) should report the results of an active surveillance programme in which the NAI or HPNAI susceptible poultry population undergoes regular clinical examination and active surveillance planned and implemented according to the general conditions and methods described in these recommendations. The surveillance should at least give the confidence that can be given by a randomized representative sample of the populations at risk.

Article 10.4.32.

NAI free establishments within HPNAI free compartments: additional surveillance procedures

The declaration of NAI free establishments requires the demonstration of absence of NAI infection. Birds in these establishments should be randomly tested using virus detection or isolation tests, and serological methods, following the general conditions of these recommendations. The frequency of testing should be based on the risk of infection and at a maximum interval of 21 days.

Article 10.4.33.

The use and interpretation of serological and virus detection tests

Poultry infected with NAI virus produce antibodies to haemagglutinin (HA), neuraminidase (NA), nonstructural proteins (NSPs), nucleoprotein/matrix (NP/M) and the polymerase complex proteins.

Detection of antibodies against the polymerase complex proteins will not be covered in this Chapter. Tests for NP/M antibodies include direct and blocking ELISA, and agar gel immunodiffusion (AGID) tests. Tests for antibodies against NA include the neuraminidase inhibition (NI), indirect fluorescent antibody and direct and blocking ELISA tests. For the HA, antibodies are detected in haemagglutination inhibition (HI), ELISA and neutralization (SN) tests. The HI test is reliable in avian species but not in mammals. The SN test can be used to detect subtype specific antibodies to the haemagglutinin and is the preferred test for mammals and some avian species. The AGID test is reliable for detection of NP/M antibodies in chickens and turkeys, but not in other avian species. As an alternative, blocking ELISA tests have been developed to detect NP/M antibodies in all avian species.

The HI and NI tests can be used to subtype AI viruses into 16 haemagglutinin and 9 neuraminidase subtypes. Such information is helpful for epidemiological investigations and in categorization of AI viruses.

Poultry can be vaccinated with a variety of AI vaccines including inactivated whole AI virus vaccines, and haemagglutinin expression-based vaccines. Antibodies to the haemagglutinin confer subtype specific protection. Various strategies can be used to differentiate vaccinated from infected birds including serosurveillance in unvaccinated sentinel birds or specific serological tests in the vaccinated birds.

AI virus *infection* of unvaccinated birds including sentinels is detected by antibodies to the NP/M, subtype specific HA or NA proteins, or NSP. Poultry vaccinated with inactivated whole AI vaccines containing an influenza virus of the same H sub-type but with a different neuraminidase may be tested for field exposure by applying serological tests directed to the detection of antibodies to the NA of the field virus. For example, birds vaccinated with H7N3 in the face of a H7N1 epidemic may be differentiated from infected birds (DIVA) by detection of subtype specific NA antibodies of the N1 protein of the field virus. Alternatively, in the absence of DIVA, inactivated vaccines may induce low titres of antibodies to NSP and the titre in infected birds would be markedly higher. Encouraging results have been obtained experimentally with this system, but it has not yet been validated in the field. In poultry vaccinated with haemagglutinin expression-based vaccines, antibodies are detected to the specific HA, but not any of the other AI viral proteins. *Infection* is evident by antibodies to the NP/M or NSP, or the specific NA protein of the field virus. Vaccines used should comply with the standards of the *Terrestrial Manual*.

All *flocks* with seropositive results should be investigated. Epidemiological and supplementary *laboratory* investigation results should document the status of NAI infection/circulation for each positive *flock*.

A confirmatory test should have a higher specificity than the screening test and sensitivity at least equivalent than that of the screening test.

Information should be provided on the performance characteristics and validation of tests used.

1. The follow-up procedure in case of positive test results if vaccination is used

In case of vaccinated populations, one has to exclude the likelihood that positive test results are indicative of virus circulation. To this end, the following procedure should be followed in the investigation of positive serological test results derived from *surveillance* conducted on NAI-vaccinated poultry. The investigation should examine all evidence that might confirm or refute the hypothesis that the positive results to the serological tests employed in the initial survey were not due to virus circulation. All the epidemiological information should be substantiated, and the results should be collated in the final report.

Knowledge of the type of vaccine used is crucial in developing a serological based strategy to differentiate infected from vaccinated animals.

- a. Inactivated whole AI virus vaccines can use either homologous or heterologous neuraminidase subtypes between the vaccine and field strains. If poultry in the population

have antibodies to NP/M and were vaccinated with inactivated whole AI virus vaccine, the following strategies should be applied:

- i. sentinel birds should remain NP/M antibody negative. If positive for NP/M antibodies, indicating AI virus infection, specific HI tests should be performed to identify H5 or H7 AI virus infection;
 - ii. if vaccinated with inactivated whole AI virus vaccine containing homologous NA to field virus, the presence of antibodies to NSP could be indicative of *infection*. Sampling should be initiated to exclude the presence of NAIV by either virus isolation or detection of virus specific genomic material or proteins;
 - iii. if vaccinated with inactivated whole AI virus vaccine containing heterologous NA to field virus, presence of antibodies to the field virus NA or NSP would be indicative of *infection*. Sampling should be initiated to exclude the presence of NAIV by either virus isolation or detection of virus specific genomic material or proteins.
- b. Haemagglutinin expression-based vaccines contain the HA protein or gene homologous to the HA of the field virus. Sentinel birds as described above can be used to detect AI infection. In vaccinated or sentinel birds, the presence of antibodies against NP/M, NSP or field virus NA is indicative of *infection*. Sampling should be initiated to exclude the presence of NAIV by either virus isolation or detection of virus specific genomic material or proteins.
2. The follow-up procedure in case of positive test results indicative of infection for determination of infection due to HPNAI or LPNAI virus

The detection of antibodies indicative of a NAI virus infection as indicated in point a)i) above will result in the initiation of epidemiological and virological investigations to determine if the infections are due to HPNAI or LPNAI viruses.

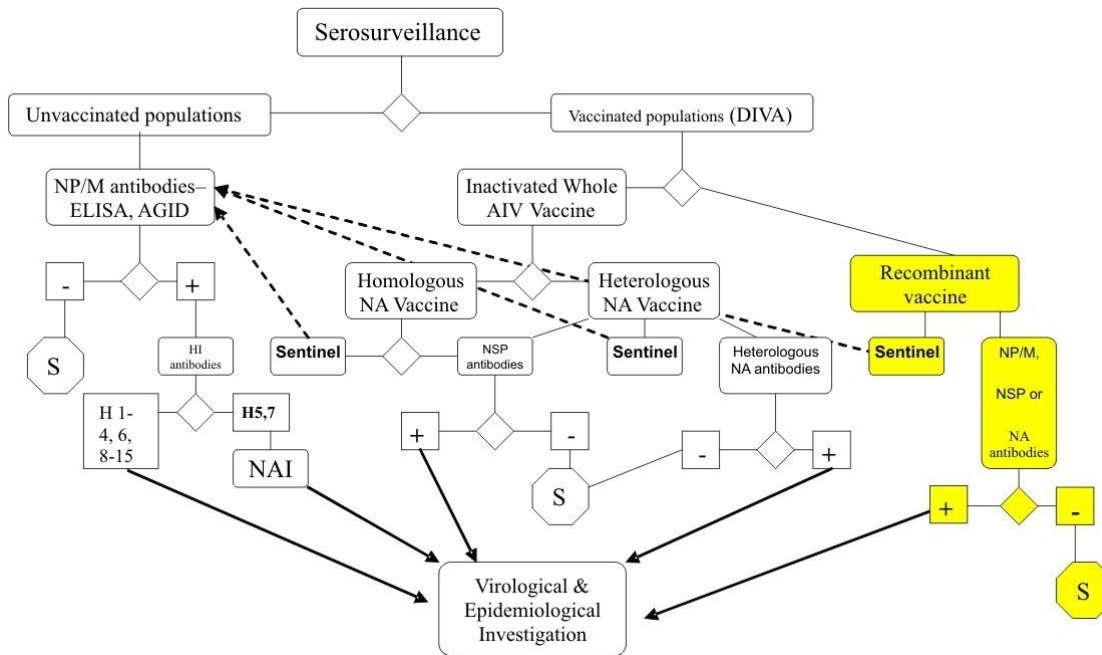
Virological testing should be initiated in all antibody-positive and at risk populations. The samples should be evaluated for the presence of AI virus, by virus isolation and identification, and/or detection of influenza A specific proteins or nucleic acids (Figure 2). Virus isolation is the gold standard for detecting *infection* by AI virus and the method is described in the *Terrestrial Manual*. All AI virus isolates should be tested to determine HA and NA subtypes, and *in vivo* tested in chickens and/or sequencing of HA proteolytic cleavage site of H5 and H7 subtypes for determination of classification as HPNAI, LPNAI or LPAI (not notifiable) viruses. As an alternative, nucleic acid detection tests have been developed and validated; these tests have the sensitivity of virus isolation, but with the advantage of providing results within a few hours. Samples with detection of H5 and H7 HA subtypes by nucleic acid detection methods should either be submitted for virus isolation, identification, and *in vivo* testing in chickens, or sequencing of nucleic acids for determination of proteolytic cleavage site as HPNAI or LPNAI viruses. The antigen detection systems, because of low sensitivity, are best suited for screening clinical field cases for *infection* by Type A influenza virus looking for NP/M proteins. NP/M positive samples should be submitted for virus isolation, identification and pathogenicity determination.

Laboratory results should be examined in the context of the epidemiological situation. Corollary information needed to complement the serological survey and assess the possibility of viral circulation includes but is not limited to:

- a. characterization of the existing production systems;
- b. results of clinical *surveillance* of the suspects and their cohorts;
- c. quantification of vaccinations performed on the affected sites;
- d. sanitary protocol and history of the affected *establishments*;
- e. control of *animal identification* and movements;
- f. other parameters of regional significance in historic NAIV transmission.

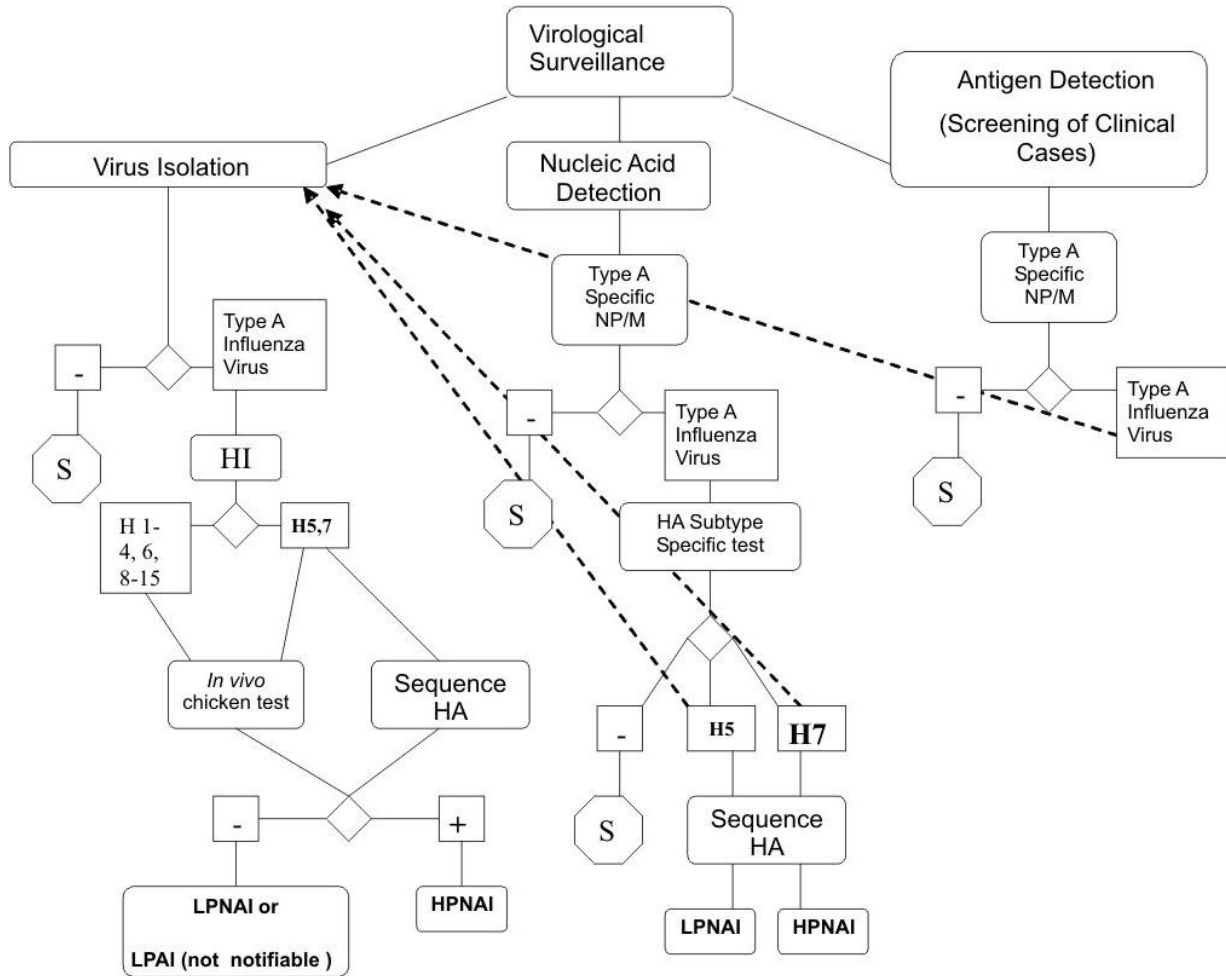
The entire investigative process should be documented as standard operating procedure within the epidemiological *surveillance* programme.

Fig. 1. Schematic representation of laboratory tests for determining evidence of NAI infection through or following serological surveys



- Key:
- AGID Agar gel immunodiffusion
 - DIVA Differentiating infected from vaccinated animals
 - ELISA Enzyme-linked immunosorbant assay
 - HA Haemagglutinin
 - HI Haemagglutination inhibition
 - NA Neuraminidase
 - NP/M Nucleoprotein and matrix protein
 - NSP Nonstructural protein
 - S No evidence of NAIV

Fig. 2. Schematic representation of laboratory tests for determining evidence of NAI infection using virological methods



The above diagrams indicate the tests which are recommended for use in the investigation of poultry [flocks](#).

- Key:
- AGID Agar gel immunodiffusion
 - DIVA Differentiating infected from vaccinated animals
 - ELISA Enzyme-linked immunosorbant assay
 - HA Haemagglutinin
 - HI Haemagglutination inhibition
 - NA Neuraminidase
 - NP/M Nucleoprotein and matrix protein
 - NSP Nonstructural protein
 - S No evidence of NAI

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APPENDIX 8

VACCINATION AS A POSSIBLE CONTROL MEASURE UNDER CERTAIN SPECIFIC CIRCUMSTANCES

The following is a recommendation of what the policy would be if vaccination is considered as a possible control measure

1. When to be regarded as a possible option

Vaccination is currently not considered as a possible control measure in the case of an outbreak of Highly Pathogenic Notifiable Avian Influenza, as the slaughter-out of all infected birds is the current control policy followed. This enables the country to regain its HPNAI-free status and thus continue with international trade as soon as possible after eradicating the disease. This time period according to OIE Guidelines is 3 months after the slaughter of the last infected poultry.

1.1 Vaccination as a possible control measure will only be considered under the following circumstances:

- (i) Uncontrollable outbreak of Highly Pathogenic Notifiable Avian influenza in the country. This is where the disease is spreading very rapidly or where the disease is occurring on more than a single front or in more than one Province. Vaccination will be employed in conjunction with slaughtering-out, as a defence ring to prevent spread of the disease, while slaughtering-out is taking place inside the 'line of defence'. All vaccinated birds will be slaughtered eventually, as the presence of antibodies (even if due to vaccination) will confuse future routine serological surveillance (notwithstanding the use of the DIVA principle (differentiating infected from vaccinated animals). Serological surveillance would be one of the important tools used to establish the disease status in the area or country.
- (ii) As an 'insurance policy' should continued and persistent outbreaks become a real threat. In this case the consequences for international trade have to be taken into account with extreme care, for all affected industries.

1.2 Issues that need to be considered:

- (1) It is imperative that the poultry and ostrich industries are completely aware of the implications of vaccination in the country, as this would change the current/future status and would require new negotiations with importing countries and exports may not be able to take place at all. It therefore has to be carefully assessed whether vaccination is worthwhile for a particular situation.

- (2) Movement of:
- (i) 'point-of-lay' hens
 - (ii) culls
- i.e. the widespread dissemination of vaccinated birds into the market place.
- (3) OIE chapter on avian influenza.
In this chapter, provision is made for vaccinated live poultry (other than day-old), live birds other than poultry, day-old live poultry, hatching eggs, eggs for consumption, etc
- (4) National ongoing surveillance to be carried out at the right confidence levels, correct prevalence of disease and frequency of testing.
Ongoing surveillance and monitoring programmes would be needed on all vaccinated flocks at not more than 6 monthly intervals. This would require a DIVA strategy to be developed for serological testing and the additional security of identifiable sentinel birds to help identify the presence of field infection in vaccinated flocks. This would be an expensive and administratively demanding exercise.
- (5) Ongoing feed-back from industry on numbers of flocks vaccinated, when, response to vaccine, need to revaccinate, use of DIVA and or sentinel birds, stocks of vaccine etc.
- (6) Capacity of Veterinary Services - ability to develop and run DIVA test, cope with sample volume, monitor companies/farms results, control vaccine use, inspect flocks etc.
- (7) Effect of use of vaccine on serology test results. Unable to use routine commercial ELISA tests as have to differentiate vaccinated from field infected flocks (DIVA) principle. Need to vaccinate with heterologous N type but homologous H type and detect N type of the current field strain of virus. Required to run identifiable sentinel birds in certain flocks as an additional security measure to ensure no occurrence of field virus.

1.3 Types of vaccines

- Homology of subtype: complete homology of subtype is ideal, otherwise as close as possible with respect to N-subtype
- Whole vs sub-unit vaccines, recombinant vaccine
- Specifications for antigen and antigen content (antigen load/titre).
- Inactivated oil emulsion type only.
- Suitable for differentiation between vaccinated and infected birds (see above).
- Vehicle important i.e. the type of adjuvant used in the vaccine

1.4 Control of use of vaccine

- Veterinary prescription only
- Maintenance of official register
- Control by State Veterinary Services

APPENDIX 9

NOTIFIABLE AVIAN INFLUENZA (NAI) SURVEILLANCE PROTOCOL FOR COMPULSORY SURVEILLANCE IN SOUTH AFRICA TO PROVE CONTINUED NAI FREEDOM Edition 2 - June 2009

South Africa could, after the successful country-wide survey, declare itself free from NAI in September 2005. South Africa has to remain vigilant however and all measures have to be taken to reduce the risk of the re-introduction of the infection. Surveillance testing also has to be carried out to confirm the country's disease-free trading status for NAI.

The following protocol is being followed:

GENERAL

1. Official control:

All testing to be carried out under official control i.e. done by State Veterinarian (SV) or Animal Health Technician (AHT) or designated person as arranged with SV. The SV remains responsible and should at least audit the testing if not done by his/her own staff. Designated persons can be authorized by the National Director Animal Health (DAH) to collect official samples under control of the SV.

2. Ongoing testing:

Testing is to be carried out on an ongoing basis with each property tested twice a year (at least). The results, however, are supplied to the DAH on 1 January and 1 July every year. (State Veterinary officials are advised to not start each cycle of testing a mere 2 weeks before the results are due to be submitted!)

3. Targeted surveillance:

- (a) Statistically significant numbers of non-commercial chicken operations because of the risk of exposure to wild birds.
- (b) As many large commercial chicken operations as possible because of the large concentration of chickens with a high epidemiological risk profile

- (c) All commercial ostrich operations because of their historic risk profile and the 2004 and 2006 outbreaks. Although testing of ostriches has been limited to slaughter birds, as a result of the outcome of the 2005 survey, it remains important to test ostriches from as many farms as possible (i.e. all farms supplying ostriches for slaughter) in order to detect and deal with any possible future outbreak as soon as possible. Additional tests on ostrich breeding and chick raising establishments may be conducted at the discretion of the Provincial Director Veterinary Services (PDVS) according to the perceived possible risk (for example increased surveillance in coastal areas of Southern Cape province).
- (d) Emu birds are also included in the compulsory surveillance programme, as emus are members of the ratite family and have previously been involved in influenza outbreaks in a few countries.

(4) Reporting

Six-monthly summary reports are to be supplied by the PDVS to the DAH of the summary of results in the prescribed format (electronic copies for each Province available from Dr Grietjie de Klerk, Sub-Directorate Epidemiology, Directorate Animal Health (DAFF)). In addition to this, there must be immediate notification of any suspicious results to the PDVS and DAH.

(5) Testing procedure:

The sampling strategy is laid out under 'D' with serological testing to be done by one of the three official laboratories or a DAFF approved laboratory. The industries and producers are responsible for the costs of testing all commercial chicken and ostrich operations, while DoA will pay for the testing of samples from non-commercial chicken operations as well as emu farms if submitted in the prescribed manner by the State Veterinarian.

For the purpose of determining NAI freedom, South Africa has decided to use serological testing for antibodies to H5 and H7 AI subtypes (NAI). Should there be suspicious results, they are to be followed up by additional tests (including PCR) as discussed with the DAH.

(6) Biosecurity:

Surveillance is not a preventative measure on its own and biosecurity is crucial in the risk management of NAI. All surveillance activities at commercial chicken, ostrich and emu operations with large concentrations of animals at risk should thus be used to create awareness and compliance with the relevant biosecurity measures (See Appendix A, B and C)

A. CHICKENS**1. Non-commercial chickens**

Evidence to be provided by the PDVS about a six-monthly random survey in chickens in his/her Province, conducted in the following manner:

- 1.1 As many randomly selected epidemiological units as possible should be tested bi-annually (6 monthly) with a minimum of 50 flocks/units per Province. (The number of properties to be sampled may be increased as determined by the DAH according to epidemiological requirements)
- 1.2 Method of determining properties to be sampled:

Properties to be selected on a *random geographical* basis. This includes the identification of a site (point) in random fashion, with sampling carried out on the property with chickens that is closest to the identified site (be it a rural site or a commercial poultry farm).
- 1.3 Samples to be submitted for H5 and H7 testing to one of the official laboratories or DAFF approved laboratories as detailed below (point D).
- 1.4 Costs to be covered by the DoA if samples are received correctly labelled, with full information at the laboratory.
- 1.5 Full records of sampling dates, sites, laboratory result sheets etc to be kept in the Province for auditing purposes.
- 1.6 A report to be submitted by PDVS to DAH at 6 monthly intervals (1 January and 1 July of each year) that should include the following in table format:
 - Name of farm
 - Owner of farm (name and initials)
 - Magisterial district
 - GIS reference points (South and East)
 - Date of sampling
 - Results
 - Laboratory where tested

Note: The Excel report format that was used in the 2005 survey should be used. Electronic copies of the reporting format is available from Dr Grietjie de Klerk at (012) 319 7412, email: grietjiedk@nda.agric.za

2. Commercial chicken farms

Traceability and bio-security measures have to be of high standard on all large scale commercial chicken farms even if not directly involved in export (Appendix A). A bi-annual (6-monthly) NAI survey also has to be carried out on these farms.

2.1 Bi-annual (6 monthly) survey:

- (i) A bi-annual survey has to be carried out on commercial chicken farms as detailed below (point D). This has to be included in routine serological monitoring programmes
- (ii) Prior notification of the Provincial State Veterinary authorities of the intended sampling
- (iii) Sampling by the designated person as agreed by the Provincial Veterinary Authority. It is suggested that an arrangement be made by the PDVS with the private consultant veterinarian or in-house veterinarian of commercial chicken farms in order to alleviate pressure on provincial staff and safeguard biosecurity. Such persons can be authorized by the DAH to collect official samples under control of the SV.
- (iv) Sent to official state or DAFF approved laboratory with results to be copied to the Provincial State Veterinary Authority
- (v) All testing to be carried out at the cost of the owner.
- (vi) Full records of sampling dates, sites, laboratory result sheets etc to be kept in the Province for auditing purposes.

2.2 Records to be submitted by PDVS to DAH:

Bi-annual summaries of NAI testing to be submitted by the PDVS to the DAH at six-monthly intervals (1 January and 1 July of each year) that should include the following in table format:

- Name of farm
- Owner of farm (name and initials)
- Magisterial district
- Type of farm (broiler, breeder, layer)

- GIS reference points (South and East)
- Sample size
- Date of sampling
- Laboratory where tested
- Results
- Dates of last two bi-annual tests

Note: The Excel report format that was used in the 2005 survey should be used. Electronic copies of the reporting format is available from Dr Grietjie de Klerk at (012) 319 7412, email: grietjiedk@nda.agric.za

2.3 Sampling strategy:

(See 'D')

B. OSTRICHES

Traceability and bio-security measures have to be upgraded on all domestic ostrich farms that either supply ostriches for slaughter to export abattoirs or that supply hatching eggs or chicks for this purpose (Appendix B). A bi-annual (6-monthly) NAI survey also has to be carried out on these farms. Evidence has to be provided by the PDVS in the following manner that all such domestic ostrich facilities in the Province are registered for export purposes, practice adequate bio-security and conduct at bi-annual intervals, testing for NAI at one of the official or DAFF approved laboratories.

As a result of the 2005 survey, routine testing of ostriches has been limited to slaughter birds that may be tested on the farm or at the abattoir. However, it remains important to test ostriches from as many farms as possible (i.e. all farms supplying ostriches for slaughter) in order to detect and deal with any possible future outbreak as soon as possible. Additional tests on ostrich breeding and chick raising establishments may be conducted at the discretion of the PDVS according to the perceived possible risk. Increased surveillance in the coastal areas of the Southern Cape is recommended.

1. Bi-annual (6 monthly) survey:

- (a) A bi-annual (6 monthly) survey has to be carried out for all ostrich facilities, as detailed below (point D). The survey should be continuous, with emphasis placed on testing after winter and again in autumn. The report has to be submitted on 1 January and 1 July each year.
- (b) Prior notification of the Provincial State Veterinary authorities of the intended sampling
- (c) Sampling by the designated person as agreed by the Provincial Veterinary Authority. The SAOBC has agreed/offered to assist with identifying designated persons as required/requested by the PDVS. Such persons can be authorized by the DAH to collect official samples under control of the SV.
- (d) Sent to official state laboratory with results to be copied to the Provincial State Veterinary Authority
- (e) Payment for testing to be carried out by the South African Ostrich Business Chamber.
- (f) The survey is to be ongoing, with the submission of the report on a 6-monthly basis (1 January and 1 July each year). Emphasis must be placed on testing after winter and again in autumn.

- (g) Full records of sampling dates, sites, laboratory result sheets etc to be kept in the Province for auditing purposes.

2. Records to be submitted by PDVS to National DAH:

2.1 Bi-annual summaries of NAI testing at all ostrich facilities to be submitted by the PDVS to the DAH at six-monthly intervals (1 January and 1 July of each year) that should include the following in table format:

- Name of farm
- Owner of farm (name and initials)
- Type of farm (chicks, slaughter birds, breeders)
- GIS reference points (South and East)
- Sample size
- Date of sampling
- Results
- Laboratory where tested
- Dates of last two bi-annual tests

Note: The Excel report format that was used in the 2005 survey should be used. Electronic copies of the reporting format is available from Dr Grietjie de Klerk at (012) 319 7412, email: grietjiedk@nda.agric.za

3. Sampling strategy: See point D

C. EMU BIRDS

It is proposed that the following actions are taken by each Province in the country:

(1) Number and location of emu farms in each Province

This should also include the name and address of the owner.

(2) Avian influenza status of these farms.

This could be determined by bleeding and testing of each epidemiological unit on each emu farm every 6 months, as per 'Appendix 9' of the 'Contingency Plan in case of an outbreak of Notifiable Avian Influenza (NAI) in Poultry in South Africa' Edition 3, Revised June 2009.

The haemagglutination inhibition (HI) test has to be used for testing of blood samples.

Surveillance results must be sent with the notifiable avian influenza results of each province to:
Dr Grietjie de Klerk
Email: grietjiedk@nda.agric.za
Tel: (012) 319 7412
Fax: (012) 319 7470

The template for submission of results is available for this purpose from Dr G de Klerk at the above contact numbers, address.

It is essential to build up a data bank on emus in this country, as they are also susceptible to avian influenza and emu farming is becoming increasingly popular!

D. SAMPLING STRATEGY:

1. The sampling strategy for chickens, ostriches and emus is as follows:

All **serological testing** has to be designed to detect the presence or absence of the exposure of ostriches/chickens/emus to H5 and H7 avian influenza subtypes (NAI) at >10% prevalence with 95% confidence in every epidemiological unit on each farm or site or multi-age unit (age group or management unit); i.e. the number of birds to be tested depends on the size of each group on every farm as follows:

Size of the epidemiological group	No. of ostriches*/ chickens/emus to be sampled
≤ 10	10
≤ 20	16
≤ 50	22
≤ 100	25
≤ 200	27
≤ 900	28
> 900	29

- As a result of the 2005 survey, routine testing of ostriches has been limited to slaughter birds that may be tested on the farm or at the abattoir. However, it remains important to test ostriches from as many farms as possible (i.e. all farms supplying ostriches for slaughter) in order to detect and deal with any possible future outbreak as soon as possible. Additional tests on ostrich breeding and chick raising establishments may be conducted at the discretion of the PDVS according to the perceived possible risk.
 - Blood samples to be taken in red-topped tubes (tubes without any anti-coagulant).
 - If possible, draw serum off after blood has clotted.
 - Submit serum samples only to one of the following official laboratories:
 - Allerton Veterinary Laboratory, 458 Townbush Rd, Montrose, Pietermaritzburg, 3201 (Tel: 033 – 347 6204)
 - Stellenbosch Veterinary Laboratory, Helshoogte Road, Stellenbosch, 7600 (Tel: 021 – 887 0324)
 - Onderstepoort Veterinary Institute, Virology Section, Onderstepoort, 0110 (Tel: 012 – 529 9111)
 - One of the DAFF approved private laboratories

For submission forms, please contact the respective laboratory. Please, identify the species, e.g. Ostrich, Chicken, Duck, emu etc. (NOT just 'avian'), and supply full information on all submission forms.

NOTE: OSTRICH SAMPLES FROM FARMS IN THE WESTERN CAPE PROVINCE ARE TO BE SUBMITTED TO THE PVL STELLENBOSCH, WHILE SAMPLES FROM OSTRICH FARMS IN THE REST OF THE COUNTRY ARE TO BE SUBMITTED TO THE ONDERSTEPSPOORT VETERINARY INSTITUTE OR A DAFF APPROVED LABORATORY.

2. Serology tests to be done:

Serology tests have to be carried out for H5 as well as H7 subtypes

Chickens: Haemagglutination Inhibition or commercial ELISA tests (only if chickens not vaccinated with inactivated H6 vaccine).

Ostriches: Haemagglutination Inhibition test

Emus: Haemagglutination inhibition test

3. In the case of suspicious/positive serological test results, the following procedure applies:

- (a) Immediate notification of PDVS and DAH by the responsible SV and laboratory.
- (b) Immediate resampling of the property for serological testing and submission of the samples to at least two of the laboratories (either official or DAFF approved) as arranged with the National Department of Agriculture, Forestry & Fisheries (contact Dr A.C.E Pienaar or Dr Grietjie de Klerk), combined with a full epidemiological investigation on the property by the SV.
- (c) Any additional sampling, testing and quarantine as decided by the PDVS in conjunction with the DAH.

APPENDIX A

BIOSECURITY GUIDELINES FOR ALL COMMERCIAL CHICKEN OPERATIONS IRRESPECTIVE OF WHETHER OR NOT EXPORT FACILITY

The following minimum biosecurity measures are recommended for chicken farms/establishments:

(1) Fencing

The chicken houses/production sites should be fenced off, ideally with electric fencing

(2) Access control for visitors, vehicles (feed trucks, visitors):

2.1 A security gate, preferably electric will prevent unauthorized entry to the farm

2.2 The access road to the farm should run as far away from the sites/houses as possible, with dedicated smaller access roads to each site.

2.3 Visitors:

Visitors should not be allowed inside the chicken houses, unless they have not had access to poultry for at least the last 3 days or have taken a shower (removal of all clothes and including the washing of hair) after arrival on the farm.

2.4 Feed delivery:

- Feed trucks should be cleaned/disinfected at the feed depot and leave directly from the depot to the farm.
- Multiple deliveries of feed should be avoided at all times.
- Feed silos should be erected with access by the feed truck from outside the fence
- On farm disinfection of feed trucks with high pressure hoses last resort

(3) Water

Water should not be sourced from open standing or running water without treatment.

(4) Dedicated specific sites/buildings

(5) Workers

- Workers should have dedicated, specific jobs
- Protective clothing:
Enforced wearing of protective clothing for all workers (at least overalls and gumboots for poultry houses and hatcheries)
- Workers should be prohibited from keeping their own poultry, either at dwellings on the farm itself or at houses away from the farm.
- Workers should not be allowed to bring poultry meat for consumption onto the premises
- Toilets on site for all workers with toilet paper and hand washing facilities

(6) Foot baths

Properly administered foot baths should be placed at the entry of all poultry houses. Foot baths should contain disinfectant that is replaced at regular intervals (definitely as soon as dirty) and no entry or exit by workers whilst by-passing the foot bath.

(7) Wild birds

There should be NO contact between wild birds and chickens.

- Houses should be constructed in such a way that wild birds cannot gain entry
- NO open water in the vicinity of the chicken houses. This includes open dams, ponds or even furrows
- Spilt feed should be removed immediately.

(8) Rodents

- An effective rodent control programme should be followed
- Rats and mice should not have access to poultry feed or –houses

(9) Surveillance

(See surveillance protocol)

(10) General

It is essential that all chicken farmers liaise closely with their respective SV. Transparency is essential and any outbreak of disease, or suspected outbreak of disease has to, according to the Animal Diseases Act (Act 35 of 1984), be reported to the State Veterinary Services. This will ensure that the presence and nature of the disease is established without delay and necessary measures can be instituted by the veterinary authority to control losses and prevent the potential spread of the disease.

APPENDIX B

BIOSECURITY GUIDELINES FOR THE OSTRICH INDUSTRY

The outbreak of Highly Pathogenic Notifiable Avian Influenza on ostrich farms in the Eastern and Western Cape Provinces last year has highlighted various aspects of the ostrich industry that are not conducive to efficient disease control. Biosecurity and disease monitoring in particular are an important aspect of disease control that need to be addressed in future to prevent further disease problems, especially avian influenza.

The following applies to all domestic ostrich facilities that supply the export facility (e.g. breeder farms that supply a specific hatchery, grower farms that supply a certain abattoir)

(1) Purchase of ostriches:

Ostriches should only be bought or received onto a farm from previously tested and negative sources.

Do not buy any ostrich unless it has been tested negative for avian influenza. Serological testing has to be done at least twice, with an interval of at least 3 weeks and the last test within 2 weeks of movement from the farm of origin.

(2) Traceability

(a) Registration of all ostrich farms/holdings

It is essential that all ostrich farms/holdings in the country, irrespective of size and whether the ostriches are kept for the export of meat, are registered by the Provincial Veterinary Services. Full GPS details of the location of the farm have to be obtained. The data should also include up-to-date figures on the number and age groups or type of birds on the farm.

(Refer to VPN for the export of ratite meat)

(b) Proper identification

All ostriches on the farm/holding have to be identified. This is essential to facilitate good record-keeping. A tag that is located under the wing is not the most practical identification method, as it can be read only once the ostrich has been caught and restrained. A tag that is located on the neck is more practical and should be used. All ostriches above the age of 3-4 months have to be tagged, but definitely before any movement occurs. If ostrich chicks at a younger age are to be moved, they have to be tagged at a younger age, prior to movement.

(3) Biosecurity

(a) Separation of species:

There should be no other domestic bird species kept in close contact with ostriches. These include ducks, geese, free range/backyard fowl, emus and turkeys.

Pigs should also not be kept in close contact with the ostriches.

(b) Wild birds, especially wild water birds should be discouraged from having contact with the ostriches. Ostriches should not be kept in camps where there are open pans or vlei areas. Such an area should be properly fenced off to prevent access by ostriches.

(c) Workers should be prohibited to keep their own poultry, either at dwellings on the farm itself or at houses away from the farm.

(d) Water:

(i) Supply

The supply of water for ostriches should consist of structured water troughs in properly constructed and dedicated areas that supply water without attracting wild water birds.

(ii) Disinfection

Drinking water should be disinfected with a suitable disinfectant to inactivate any possible influenza virus without harming the ostriches. Registered disinfectants that could be used include: F10, Virukill, Virkon or standard water chlorination methods.

(iii) Irrigation canals

In areas where camps are linked by means of irrigation canals (e.g. Southern Cape region) these canals have to be fenced off. This will prevent faecal material from ostriches from being transported to neighbouring camps along the route of the canal system.

4. Surveillance

(See surveillance protocol)

5. General

It is essential that all ostrich farmers liaise closely with their respective State Veterinarian. Transparency is essential and any outbreak of disease, or suspected outbreak of disease has to, according to the Animal Diseases Act (Act 35 of 1984), be reported to the State Veterinary Services. This will ensure that the presence and nature of the disease is established without delay and necessary measures can be instituted by the veterinary authority to control losses and prevent the potential spread of the disease.

APPENDIX C

BIOSECURITY GUIDELINES FOR THE EMU INDUSTRY

1. Although no outbreak of avian influenza has taken place in emu birds in the country, biosecurity and disease monitoring in particular, is important to prevent disease problems, especially avian influenza, in future.

The following applies to all emu facilities:

(1) Purchase of emu birds:

Emu birds should only be bought or received onto a farm from previously tested and negative sources.

Do not buy any emu chick unless it has been tested negative for avian influenza. Serological testing has to be done at least twice, with an interval of at least 3 weeks and the last test within 2 weeks of movement from the farm of origin.

(2) Traceability

(a) Registration of all emu farms/holdings

It is essential that all emu farms/holdings in the country, irrespective of size and purpose, are registered by the Provincial Veterinary Services. Full GPS details of the location of the farm have to be obtained. The data should also include up-to-date figures on the number and age groups on the farm.

(3) Biosecurity

(a) Separation of species:

There should be no other domestic bird species kept in close contact with emus. These include ducks, geese, free range/backyard fowl, ostriches and turkeys.

Pigs should also not be kept in close contact with the emus.

(b) Wild birds, especially wild water birds should be discouraged from having contact with the emus. Emus should not be kept in camps where there are open pans or vlei areas. Such an area should be properly fenced off to prevent access by the emus.

(c) Workers should be prohibited to keep their own poultry, either at dwellings on the farm itself or at houses away from the farm.

(d) Water:

(i) Supply

The supply of water for emus should consist of structured water troughs in properly constructed and dedicated areas that supply water without attracting wild water birds.

(ii) Disinfection

Drinking water should be disinfected with a suitable disinfectant to inactivate any possible influenza virus without harming the emus. Registered disinfectants that could be used include: F10, Virukill, Virkon or standard water chlorination methods.

4. Surveillance

(See surveillance protocol)

5. General

It is essential that all emu farmers liaise closely with their respective State Veterinarian. Transparency is essential and any outbreak of disease, or suspected outbreak of disease has to, according to the Animal Diseases Act (Act 35 of 1984), be reported to the State Veterinary Services. This will ensure that the presence and nature of the disease is established without delay and necessary measures can be instituted by the veterinary authority to control losses and prevent the potential spread of the disease.