

CARIBBEAN POULTRY ASSOCIATION

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Item iii.b

DRAFT EMERGENCY POULTRY DISEASE PROGRAM MANUAL AND GUIDELINES

**FOR THE CONSIDERATION OF THE CARICOM
CHIEF VET OFFICERS/ CHIEF VET PUBLIC HEALTH OFFICERS**

8 – 9th December 2003, POS, Trinidad and Tobago

27th November 2003

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0.0 BACKGROUND

Two poultry diseases are considered to be sufficiently serious to be included on 'List A' of the OIE, namely: (a) Highly Pathogenic Avian Influenza and (b) Exotic Newcastle Disease. List A diseases are “*transmissible diseases which have the potential for very rapid and serious spread, irrespective of national borders, which are of serious socio-economic or public health consequence and which are of major importance in the international trade of animals and animal products*”. In the past few years there have been well-documented outbreaks of both these poultry diseases in many countries of the world and both diseases are a constant threat to birds reared domestically in the Caribbean. Both these diseases have been used as a legitimate trade barrier to protect countries and regions from an introduction of an exotic or foreign poultry disease. Recent outbreaks of Exotic Newcastle Disease in the USA has served as a wakeup call for the Caribbean where the poultry industry is a critical and important sub-sector of the agriculture sector, providing employment for thousands of people and is the major source of animal protein for the population.

Recent outbreaks have shown that all poultry industries worldwide are at risk of infection with Avian Influenza and exotic Newcastle Disease.

Emergency disease preparedness planning should be recognized as an important core function of all National Veterinary Services. Experience has shown that it is often far too late to leave such planning to the time when a disease outbreak has actually occurred. The role of the poultry industry and other interested parties working in conjunction with the veterinary services is critical to emergency disease preparedness planning and management.

Emergency poultry disease control programme must be conducted in compliance with animal health laws and regulations within each country. These guidelines seek to define the responsibility of both the official government veterinary services and the poultry industry and also recommend general and specific procedures for handling outbreaks of both Highly Pathogenic Avian Influenza and Exotic Newcastle Disease.

Outbreaks of Avian Influenza and Newcastle Disease are becoming progressively more expensive to control and the economic impact on producers and consumers is very significant and is a reflection of the growth of the poultry industry worldwide. Diagnosis of either of these diseases requires immediate control measures to limit its spread and to avert international embargoes on export of poultry and poultry products from affected countries.

1.0 EMERGENCY POULTRY DISEASE COMMITTEE

The Chief Veterinary Officer or the Director of Veterinary Services should have overall technical responsibility with regards to preparedness for and management of animal health emergencies. The Minister of Agriculture under whose portfolio the Veterinary Services falls would be ultimately responsible.

As an integral and important core function of the National Veterinary Services adequate funding and other resources must be allocated to these activities and the Chief Veterinary Officer should seek the active support and commitment of all interested parties. These should include other senior officials of the Ministry of Agriculture, other government departments and agencies including the Disaster Preparedness Organization, farming communities and organizations, poultry marketing authorities, poultry traders and exporters and the poultry industry in general. In addition the small informal back-yard poultry farmers should not be neglected.

An Emergency Disease Committee should be appointed to facilitate and co-ordinate emergency planning. Ideally this Committee should be an inter-ministerial, inter-sectional and inter-institutional body with representatives from various government ministries, quasi-government institutions and the private sector. This broad based representation is to ensure that the Committee has at its disposal the necessary wherewithal to achieve its objectives, while at the same time all interest groups are adequately represented.

The Chief Veterinary Officer who would be directly accountable to the Minister should ideally chair this committee. The committee should include:

- ◆ Chief Veterinary Officer or Director of Veterinary Services
- ◆ Director of Field Veterinary Services
- ◆ Director of National Veterinary Laboratory
- ◆ Director of Animal Quarantine
- ◆ Senior Animal Health officials
- ◆ Wildlife Services representatives
- ◆ Officers from the Ministry of Finance.
- ◆ Private Sector members such as poultry industry representatives
- ◆ Chief Of Staff of The Army
- ◆ Commissioner Police
- ◆ Public Works Department
- ◆ National Disaster Preparedness Organization
- ◆ Agency for Public Information
- ◆ Ministry of Health

The role of the Committee is mainly to promulgate policies and coordinate inputs of the various government ministries and other agencies in the prevention, control and eradication of an Emergency Poultry Disease.

The Chief Veterinary Officer or Director of Veterinary Services is the Task Force Coordinator and ensures that animal quarantine measures and disease preventative measures are effectively carried out. The chief of Staff of the Army and the commissioner of Police are to ensure the logistical support for manning the restricted zones and the quarantine areas and farms. The Army may also be called upon to provide heavy equipment for disposal of dead birds.

Funds must be designated in advance to compensate owners of infected flocks that will be subjected to mandatory depletion. Without a satisfactory compensation plan owners of affected poultry will not readily make reports to the authorities, this reluctance will no doubt lead to rapid spread of the disease. In the event of an outbreak Committee should set up an appraisal team to appraise the value of all birds, products and materials destroyed because of infection or exposure to an EPD.

During normal times the Committee should meet regularly to review and refine the implementation of procedures and to update the members of any new development.

The effectiveness of a plan relies mainly upon the ability to put the plan into action at very short notice. Regular simulated field exercises should be conducted to enhance the reactive capacity of the plan and to correct any deficiency. It is only through these exercises that the plan can be kept in a state of constant readiness to cope with the constant threats of the entry of an emergency disease of poultry.

2. DISEASE CHARACTERISTICS

2.1 EXOTIC NEWCASTLE DISEASE

Newcastle Disease is frequently responsible for devastating losses in poultry operations worldwide. Avian paramyxovirus serotype 1 viruses cause Newcastle Disease. The clinical signs seen in birds infected with Newcastle Disease Virus vary widely and are dependent on factors such as the virulence of the virus, host species, age of host, environmental stress and immune status.

In general terms, birds infected with Exotic Newcastle Disease may show signs of depressions, diarrhoea, prostration, odema of the head and wattles, nervous signs such as paralysis, torticollis and respiratory signs. In laying birds, reduction in egg production is often the first sign of infection.

Exotic Newcastle Disease Virus infections have been established in at least two hundred and forty one (24)1 species of birds. The virus has been isolated from all types of commercially reared poultry ranging from pigeons to ostriches. Wild birds, including waterfowls have been implicated in outbreak of Newcastle Disease in domestic birds and poultry.

Aetiology

Avian Paramyxovirus serotype one. The many strains of the virus vary widely in their virulence. They are classified on the basis of the speed with which they kill chickens or avian embryos under defined conditions as *velogenic* (highly pathogenic), *mesogenic* (moderately pathogenic) and *lentogenic*(of low pathogenicity). Some *lentogenic* strains are considered to be avirulent.

Transmission

The primary means of spread of Newcastle Disease virus is by direct contact between healthy birds and the body secretions of virus shedding infected birds. Within a flock the main method of transmission is by inhalation of virus- laden expired air or by ingestion of drinking water or feed contaminated with nasal secretions or feces containing virus. Transmission of the ND virus by wild birds can occur from endemic foci among wild birds to poultry or mechanically from an infected poultry premises to susceptible poultry. Wild water birds are believed to be refractory to the virus but can become carriers and shed the virus for a long time. Pigeons can spread ND virus by contaminating poultry feed. The following methods of spread of ND Virus have been implicated in various epizootics worldwide:

- ◆ Movement of live birds, including wild birds, pets and exotic birds, racing pigeons and commercial poultry.
- ◆ Other birds and animals
- ◆ Movement of people and equipment
- ◆ Movement of poultry products

- ◆ Airborne spread
- ◆ Contaminated poultry feed
- ◆ Contaminated water
- ◆ Contaminated vaccines

Susceptible Species

Newcastle Disease Virus is infective for almost all avian species both domestic and wild. In mammals natural infection has been reported in man and rodents and a variety of laboratory animals have been infected experimentally. The most significant susceptible avian species are:

- ◆ Chickens
- ◆ Turkeys
- ◆ Pigeons
- ◆ Ducks
- ◆ Geese
- ◆ Peafowl, guinea fowl, pheasants, quail
- ◆ Canaries
- ◆ Psittacines (budgerigars, parrots)
- ◆ Ratites (ostriches)
- ◆ Wild waterfowl (usually associated with avirulent NDV)

Humans exposed to ND virus may suffer headache and flu-like symptoms and can develop conjunctivitis, which is usually mild, and persist for 1-2 days. Most infections have occurred among laboratory workers who handle the virus either in research or vaccine production laboratories. Vaccinators and individuals who eviscerate and prepare poultry for market may also become infected.

Incubation Period

The incubation period of Newcastle Disease in susceptible flocks is usually 5-6 days after natural exposure, but may vary from 2-15 days or longer. The length of time before clinical signs appear, if at all is variable depending on the infecting virus, the host species and the bird's age and immune status, infection with other organisms, environmental conditions, the route of exposure and the dose.

Clinical Signs

The clinical signs of ND virus infection are very variable, influenced greatly by the virulence and tissue tropism of the virus, the species, age, immune status and condition of the bird, as well as external factors such as environmental and social stress the route of exposure, and the magnitude and duration of the infecting dose. Nevertheless, clinical Newcastle Disease has been broadly classified into four syndromes as follows:

- ◆ Viscerotropic Velogenic (VVND) – high mortality, haemorrhagic enteritis is the predominant lesion.

- ◆ Neurotropic Velogenic – high mortality, respiratory and nervous signs predominate.
- ◆ Mesogenic – low mortality, respiratory signs predominate.
- ◆ Lentogenic – produces mild or inapparent respiratory infection.

An outbreak in chickens may be so severe that almost all of an infected flock dies within 72 hours without noticeable signs, often causing a suspicion of poisoning. In adult layers a marked drop in egg production may be the first sign, followed in 24-48 hours by mortality, which can reach 100%.

Clinical signs noted include:

- ◆ A sudden drop in egg production often accompanied by abnormal eggs which are misshapen, soft shelled and show loss of pigmentation.
- ◆ Loss of appetite, fever, weakness
- ◆ Swelling and cyanosis of the comb and wattles.
- ◆ Watery, bile stained, distinctly bright green or bloody diarrhoea.
- ◆ Respiratory signs may include increased respiratory rate, respiratory distress, coughing and a high-pitched sneeze.
- ◆ Nervous signs may include loss of balance, circling, backward progression, convulsions, rhythmic spasms, stiff neck, head tremors and wing and leg paralysis.

Gross Lesions

As with clinical signs, lesions will vary with the systems involved and are highly dependent on the pathogenicity of the virus. Young chickens or those dying from the peracute form of the disease may not have any lesions.

In the viscerotropic form, odema of the intestinal tissues of the neck, especially near the thorax, may be marked. Haemorrhages occur in the trachea, corresponding to the rings of the of the cartilages, and in the proventriculus, gizzard, Peyer's patches, caecal tonsils, and other aggregations of lymphoid tissues in the intestinal wall. Petechial haemorrhages may be seen on the breast muscles, heart muscle, peritoneal adipose tissue, and serous linings. In the neurotropic form there is usually a severe haemorrhagic inflammation of the trachea, but it is rare to see blood in the lumen. Haemorrhagic lesions sometimes occur in the proventriculus but rarely in the rest of the alimentary tract. Gross lesions may not be present in birds that show only nervous signs.

Differential Diagnosis

Newcastle Disease or AI should be suspected whenever sudden deaths follow severe depression, loss of appetite, nervous signs, and a drastic drop in egg production with production of abnormal eggs. The likelihood of ND or AI is increased by the presence of facial subcutaneous odema, swollen and cyanotic combs and wattles and tiny red or purple petechial haemorrhages on the internal membrane surfaces.

A diagnosis is considered to be confirmed when the NDV is isolated in embryonated eggs or cell cultures, identified and the pathotype of the strain is determined. The

clinical signs and course of Visceotropic Velogenic Newcastle Disease closely mimic a number of other avian diseases that affect the central nervous system and respiratory system.

The avian diseases that may clinically resemble some outbreaks of Visceotropic Velogenic Newcastle Disease are:

- ◆ Avian Encephalomyelitis
- ◆ Marek's Disease
- ◆ Fowl Cholera
- ◆ Botulism
- ◆ Vitamin E and Selenium deficiency
- ◆ Poisoning
- ◆ Infectious Bronchitis
- ◆ Infectious Laryngotracheitis
- ◆ Coryza
- ◆ Mycoplasmosis
- ◆ Chlamydiosis/ Psittacosis
- ◆ Fowl Pox

Diagnosis

Adequate diagnostic tools are necessary for diagnosing this disease. A properly equipped diagnostic laboratory with trained personnel and adequate financing is essential.

For identification of the virus inoculation of 9-11 day old embryonated chicken eggs followed by examination of haemagglutination activity and inhibition of haemagglutination by ND virus specific antisera are the procedures necessary. Serological tests that can be conducted for detection of antibody to the virus are the haemagglutination inhibition test and the ELISA.

Samples required by the laboratory are tracheal and cloacal swabs or feces from live birds or from pools of organs and faeces from dead birds and clotted blood samples or serum from live birds.

2.2 HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI)

This is an extremely contagious multi-organ systemic disease of poultry leading to high mortality and caused by some H5 and H7 subtypes of type A Influenza virus in the Orthomyxoviridae family. Although not as prevalent as Newcastle Disease, Avian Influenza has produced significant epizootic in chicks and turkeys on large commercial farms in some countries. Poultry flocks infected with this virus have high mortality and morbidity rates with birds developing severe clinical signs often with rapid death. Chick and turkeys are typically found dead with few clinical signs other than depression, recumbency and a comatose state.

Aetiology

A Type A influenza virus in the family Orthomyxoviridae causes avian Influenza. The type A influenza viruses, which include all AI viruses, can infect a wide variety of animals including wild ducks, chickens, turkeys, pigs, horses, and humans. The type B and C viruses primarily infect humans and occasionally pigs. The Type A viruses have eight gene segments that encode ten different surface and internal proteins. The surface proteins include the HA, Neuraminidase (NA) and matrix 2 proteins. The HA and NA proteins have large antigenic variations with fifteen HA and nine NA subtypes being recognized, based on haemagglutination-inhibition and neuraminidase-inhibition tests respectively.

The pathogenicity of individual AI viruses varies and must be determined in order to develop prevention, control and eradication strategies. The usage of the term Highly Pathogenic implies that the virus is highly virulent for chicken and has been demonstrated to meet the following criteria:

- a) Any influenza virus that is lethal for six, seven or eight of eight four to six week old susceptible chickens within ten days following intravenous inoculation with a 0.2 ml of a 1:10 dilution of a bacteria free infectious allantoic fluid.
- b) Any H5 or H7 virus that does not meet the criteria in a), but has an amino acid sequence at the HA cleavage site that is compatible with the HPAI virus
- c) Any influenza virus that is not an H5 or H7 subtype and that kills one to five of eight inoculated chickens and grows in cell culture in the absence of trypsin.

Fulfillment of one or more of the above criteria would categorize the virus as an HPAI virus. In contrast AI viruses that lack these three criteria are categorized as non-HPAI.

Non-HPAI viral strains comprise all A I virus of the H1-H4, H6 and H8-15 subtypes, and most of those of the H5 and H7 subtypes have been HPAI viruses.

The definition of AI being adopted by the OIE is as follows “Avian Influenza means an infection of poultry caused by an Influenza A virus which has an intravenous pathogenicity index in six week old chickens greater than 1.2 or any infection with Influenza A virus of H5 or 7 subtype for which nucleotide sequencing has demonstrated the presence of multiple basic amino acids at the cleavage site of the HA.

Transmission

The natural host species and reservoir for influenza viruses are wild aquatic birds, including ducks and other shore birds. Many of these birds undergo annual long distance migration. Many avian species have been reported to be naturally and asymptotically infected with influenza viruses but the main reservoirs are thought to be ducks, geese, swans, gulls, surfbirds and sandpipers. Infection in wild birds usually only produces an asymptomatic enteric infection. Infected birds can produce large amounts of virus, often defecated directly into the water. The contamination of the aquatic environment appears to be an efficient method of transmission of virus to susceptible wild birds or to domestic birds, which share the same environment. Water contaminated with AI virus in the feces of infected wild ducks has been a source of

infection for domestic turkeys. The direct transmission of influenza viruses from migrating waterfowl to range reared turkeys has been implicated as a common source of infection in outbreaks in the USA. However, transmission of AI virus from wild water fowls to chickens can also occur through intermediates, in particular domestic ducks and geese that are reared and marketed in close associations with chickens and turkeys. Once introduced into commercial chickens the virus can often spread rapidly to new locations or be maintained for long periods of time. Transmission of the virus in poultry is through respiratory secretions and faeces. Mutation of the LPAI virus in domestic birds may occur and result in the appearance of HPAI strains of virus that are responsible for causing devastating disease in domestic poultry.

Incubation Period

The incubation period of the disease in domestic birds is 1-18 days. In many cases the birds are found dead. In other cases the virus builds up slowly and cause disease after two weeks.

Clinical Signs

Chickens and turkeys with HPAI are typically found dead with few clinical signs other than depression, recumbency and a comatose state. The older the birds the greater the frequency of clinical signs appearing before death. In breeders and laying chickens, egg production drops dramatically to near zero after 3 to 5 days. Occasionally, torticollis, paresis, paralysis, excitation, convulsions and rolling or circling movements are noted in a few birds that survive to the subacute stage of the infection. Diarrhoea may be evident. Respiratory signs include nasal discharge, rales, coughing, snicking and sneezing. Oedema of the head, comb and wattles may also be observed.

Gross lesions

The appearance of gross lesions is variable depending on the virus strain, the length of time from infection to death and the age and species of poultry affected. Lesions may be absent in case of sudden death. In other cases the following lesions may be observed:

- ◆ Severe congestion of muscles
- ◆ Congested lungs
- ◆ Dehydration
- ◆ Oedema of head and neck
- ◆ Congestion of conjunctive
- ◆ Excess mucus in trachea
- ◆ Congestion of kidneys
- ◆ Hemorrhages in small intestines, proventriculus and gizzard Hemorrhage and degeneration of ovary
- ◆ Hemorrhagic foci on the lymphoid tissues in the intestinal mucosa

Differential Diagnosis

The infection must be differentiated from the following: Acute fowl cholera
Velogenic Newcastle Disease, Respiratory diseases, especially infectious
laryngotracheitis Acute cases of bacterial septicemia, especially Pasteurella multocida

Diagnosis

Identification of the agent requires inoculation of 9-11 day old embryonated chicken
eggs followed by:

- ◆ Demonstration of haemagglutination
- ◆ Immunodiffusion test to confirm the presence of AI virus
- ◆ Subtype determination with monospecific antisera
- ◆ Strain virulence evaluation

Serological tests include the Agar gel Immunodiffusion test and the
haemagglutination and haemagglutination inhibition tests.

3. PROCEDURES TO BE FOLLOWED FOR MANAGEMENT OF AN OUTBREAK OF AN EMERGENCY POULTRY DISEASE IN THE CPA MEMBER COUNTRIES.

The aggressive and rapid eradication of an EPD should receive the highest priority. Based on past experience if these infections become endemic the cost to the consumer and the taxpayer would be exceedingly high. It is highly recommended that vaccines not be used in the eradication process. Instead the stamping-out principle should be adopted. Having said that in some countries vaccines have been used to slow the spread of infection and other countries, including the EU are reconsidering their no-vaccination policy for Avian Influenza based on the availability of modern vaccines and laboratory tests able to differentiate between vaccinated and non-vaccinated flocks. Additionally, if the viruses were to spread to a region of very high poultry density the costs of destruction, compensation and the magnitude of disposal could present a formidable challenge to the industry. In such instances the decision to vaccinate may be appropriate. There is now a growing body of thought that vaccines can be incorporated into a multifaceted control programme in conjunction with quarantine, upgraded biosecurity and depletion of infected flocks.

3.1 Introduction

- All Member countries of **CPA**

- Each member state should establish an Emergency Poultry Disease Technical Committee. The Emergency Poultry Disease Technical Committee in each country should manage and implement plans to stop a threat or to control and/or eradicate emergency poultry diseases that could result in serious economic loss to the commercial poultry industry.
- The diseases are: - **Highly Pathogenic Avian Influenza and Exotic Newcastle Disease.**

3.2 Emergency Response Notification (Status Levels)

When either Highly Pathogenic Avian Influenza or Exotic Newcastle Disease is suspected on a farm or premises a government-employed veterinarian should be notified and a field investigation promptly initiated. The owner should be advised to exclude visitors from the premises and to restrict the movement of all avian species into or out of the premises. The veterinarian should obtain a history and other pertinent information from the farmer before conducting his investigation.

The investigation should commence with an examination of unaffected birds followed by an examination of the affected birds. A sketch of the layout of the premises to include all buildings, roads, streams and pastures should be made as well as the location of all captive birds on the premises.

If the initial investigation reveal that the condition is clearly not an Emergency Poultry Disease, then no further action is necessary. However a full written report of the case must be submitted to the Director of Veterinary Services or Chief Veterinary Officer within 5 days.

If the initial investigation discloses evidence of an Emergency Poultry Disease the veterinarian should immediately inform the Director Of Veterinary Services or Chief Veterinary Officer. Until the possibility of an EPD has been eliminated, movement of avian species to or from the premises involved should be prohibited, movement of personnel should be restricted and materials that might spread the virus should not be permitted to be moved from the premises.

3.2.1 **Priority 1**

This priority is used when known investigation information makes it highly likely the observed condition is a Foreign Animal Disease (EAD) or Emergency Poultry Disease (EPD).

3.2.2 **Priority 2**

This priority is used when known investigation information makes it possible that the observed conditions is a FAD/EPD but cannot be distinguished from an endemic disease or condition.

3.2.3 **Priority 3**

This priority is used when known investigation information makes it unlikely that the observed condition is an FAD/FDP and cannot be distinguished from an endemic disease or condition. It is considered most likely an endemic disease/condition due to epidemiological factors and laboratory diagnostic information is used to verify if the condition is an FAD/EPD.

3.2.4 **Minister's Declaration - (Minister of Agriculture)**

- (a) Minister's Alert: When there is a presumptive diagnosis of an Emergency Poultry Disease in a CPA member state.
- (b) Minister's Emergency Proclamation of Border Restriction - When there is a confirmed diagnosis of a FAD/EPD in a CPA member state. This would require the restriction of movement of livestock/poultry, animal transport vehicles and products as appropriate for the specific disease.
- (c) Ministers Declaration of Emergency Proclamation for Foreign or Emergency Disease within the region - When there is a confirmed outbreak of an FAD within the region that would initiate the full involvement of each country's Emergency Management Programme and the support of other agencies needed to fulfill the Response Plan.

3.2.5 **Stages for Diagnosis of an outbreak**

- (a) **Suspicion** - When symptoms are observed in a flock that causes suspicion that an emergency poultry disease may be present.

- (b) **Presumptive Diagnosis:** When a positive diagnosis of the suspected disease is made at a local diagnostic laboratory.
- (c) **Confirmed Diagnosis:** When a diagnosis of the disease is confirmed at the National Veterinary Services Laboratory (NVSL) in Ames, Iowa, USA or at another OIE Reference Laboratory for AI or Newcastle Disease. This official diagnosis is necessary before all of the outbreak response plan can be initiated. Each country is required to notify the OIE within 24 hours of the official confirmed diagnosis of either END or HPAI. When the OIE is notified of the confirmed diagnosis of either of these diseases, the export of all poultry and poultry products from the country is immediately stopped or suspended. This requirement for notification of OIE helps to protect all international trading partners from exposure to diseases foreign to each country.

This document outlines the procedures to be followed during each of the three stages.

Stage 1: - Suspicion of an Emergency Poultry Disease

➤ *Outline of sequence of events*

3.2.5.1 Action to be taken by the farmer

When suspicion of an EPD disease arises the poultry farmer, grower or operator of the facility where the poultry are located must immediately telephone or contact a Veterinary Officer, Flock Supervisor or Agriculture Field Officer of the suspicion.

3.2.5.2 Action to be taken by Veterinary Officer, Flock Supervisors or Agricultural Field Officer when notified by the farmer of the suspicion of disease.

- Immediately gives the suspected flock top priority
- Immediately notifies the Ministry of Agriculture's Veterinary Department.

3.2.5.3 Procedures for Handling Suspected Farm Premises by Flock Supervisor or Agricultural Field Officer.

1. Have Emergency Kit in car
 2. Park vehicle away from poultry house
 3. Immediately upon arrival put on protective wearing apparel
 4. If an EPD is suspected, contact the Ministry of Agriculture Veterinary Department and use the following recommended procedures.
- (a) For diagnostic specimens, select freshly dead birds or live birds showing symptoms to be humanely sacrificed. Put dead birds in a plastic bag and seal it. Suspect birds (dead or alive) should be handled in such a manner as to minimize contamination from fecal matter or other body exudates and feathers. Put on ice if possible.
 - (b) Tie off bag.
 - (c) Disinfect bag and place in second plastic bag.

- (d) Disinfect second bag.
- (e) Be careful to avoid contamination of vehicle. Before leaving the premises spray the tires and floorboards with disinfectant, and spray insecticide inside vehicle to kill any flies or other insects that may be present.
- (f) Put boots, gloves, coveralls, and hat in a trash bag. Put disposable items in trash bag and leave on the farm for proper disposal.
- (g) Put up "Restricted Entry Tape" at farm entry gate, and block entry, if possible.
- (h) Alert the appropriate diagnostic laboratory and submit the samples to the Ministry of Agriculture Veterinary Department.
- (i) Avoid contact with poultry or poultry industry personnel until there is complete decontamination of individual and vehicle.
- (j) Wash vehicle before visiting other farms.
- (k) Return home and launder all clothing worn on suspect premises immediately.
- (l) Obtain approval of company veterinary advisor or Ministry Of Agriculture Veterinary Department prior to resuming normal work contacts, and/or before visiting another premises.
- (m) If for any reason other assistance is needed, radio or telephone your veterinary department.
- (n) Quarantine should be implemented as indicated.

3.2.5.4 *Requirements of Poultry Company.*

1. Eliminate all service and other visits to that farm, including visits by supervisor, repair and maintenance personnel.
2. Fully inform farmer/grower of the problem and dangers involved.
3. Specifically restrict movement of farmer/grower and family individuals and employees.
4. Birds will be moved according to procedures outlined by the EPD Technical Committee, including dead bird disposal.
5. The EPD Technical Committee will outline procedures for house(s) after removal of birds.
6. Withhold placements until suspected disease is diagnosed.
7. In conjunction with the Veterinary Department post quarantine signs at entrance to farm and on poultry house doors or at the premises where the suspected birds are located.
8. Procedure for feed deliveries - assisted by flock supervisor:
 - a. Make delivery to affected farm a last stop for unloading feed.
 - b. Truck driver must not enter poultry house.
 - c. Truck driver must wear plastic boots and disposable coveralls (these should be left on the farm when leaving).
 - d. Truck must be run through truck wash or washed before returning to mill or delivering feed to another farm.
 - e. Spray disinfectant inside the truck cab.

- f. Keep truck doors closed during unloading operation to keep flies and other insects out. Spray household aerosol insect killer in cab before leaving farm.
9. Farmer/Grower and family restriction:
- a. Limit flock management to specific individuals only.
 - b. Fully inform these individuals on procedures for clothing disinfection, dead birds disposal and limitations on their off-farm visiting. No other farms can be visited and they should not come in contact with other growers.
 - c. Other family members working away from the farm must not enter poultry house.
 - d. Family members who work off the farm should not have contact with any other poultry or pet birds.

3.2.5.5 Action of Local Laboratory making Presumptive Diagnosis

- (1) Laboratory making presumptive diagnosis will contact company involved and the Government Veterinary Services and the owner of the flock regarding results. The Government Veterinary Services will then notify the Poultry Association and Industry and others as appropriate.

3.2.5.6 Notification of Government Veterinary Department.

- (a) Fill out EPD Report Form and fax or deliver to the Government Veterinary Department and Chief Veterinary Officer
- (b) Call and personally speak to one of the official government veterinary officers.

3.2.5.7 Action to be taken by Government Veterinary Department after a positive laboratory presumptive diagnosis of an EPD.

- (a) Contact the Poultry Company's management or the owner of the affected flock.
- (b) Immediately schedule meeting with company or owner of the flock and call EPD technical committee members.
- (c) If indicated, immediately send appropriate samples to NVSL in Ames, Iowa, USA or other OIE reference Laboratory For Poultry Diseases.

3.2.5.8 Stage II Positive Presumptive Diagnosis of an EPD

Actions to be taken by Emergency Poultry Disease Technical Committee

- Chief Veterinary Officer (CVO), or Director Veterinary Services (DVS) calls immediate meeting of EPDTC after a positive presumptive diagnosis is made. Activity.
 - (a) Designated Official Veterinary Officer does epidemiological survey of all activities on farm or at facility where the poultry are located, especially all activities for the 72 hours prior to the positive presumptive diagnosis.

- (b) Determine emergency services necessary and establish time frame for expediting these services.
- (c) Identify other potentially exposed farms or facility and outline procedures for handling it. Obtain map of area to facilitate this step.
- (d) Outline and implement appropriate dead bird disposal strategy for all quarantined farms or facility (Army, Local Government and Office of Disease Preparedness).
- (e) Reinforce quarantine procedures to assure restriction of movement at and around the affected premises.

3.3 *Stage III*

3.3.1 Confirmed Diagnosis of an Emergency Poultry Disease

Activities of EPD Technical Committee.

- ◆ Initiate a request for a Minister's Declaration of Emergency and full implementation of the Emergency Disease Plan.
- ◆ B Guiding Principles for Control and Eradication of Highly Pathogenic Avian Influenza (HPAI) and Exotic Newcastle Disease (END).

3.3.2 Eradication Strategy

The procedures for the eradication of an Emergency Poultry Disease are as follows:

- Emergency Quarantine
- Strict movement control of birds, their products and other materials that pose a risk of dissemination of disease.
- Intensified surveillance of backyard poultry
- Rapid depopulation or stamping out within a one-kilometer radius of affected premises.
- Stringent cleaning and disinfection

3.3.3 Quarantine & Control Movement

Authority to Quarantine

Under traditional Animal Health Laws and Regulations, The Minister Of Agriculture usually possesses the legal authority to impose quarantine for the control of animal diseases including Avian Influenza and Exotic Newcastle Disease.

Both Newcastle Disease and Avian Influenza can spread very rapidly and can be carried over long distances by transport of contaminated materials such as birdcages, pullets, egg flats, manure and feed. Since these diseases are readily transmitted via fomites, strict control of movement of anything that may have become contaminated with virus and immediate imposition of tightly imposed quarantine on all places suspected of being

infected is successful to a successful eradication programme. Quarantine should be imposed on all farms on which infection is either known or suspected and should be strictly policed to ensure that no one leaves the premises without changing clothes and footwear.

Quarantine of an infected premises prevents spread of the disease from the property by prohibiting the movement of all birds, products and materials to or from the property. It is important to apply quarantine as early as possible to slow the rate of spread in an area. Detailed tracing of the movement of birds, feed, poultry products and wastes to and from infected premises and dangerous contact premises is of foremost priority at the very beginning of an outbreak. Trace back procedures should apply to all movement that took place during the previous 21 days.

Quarantine measures should also be applied immediately wherever there is any doubt of potential infection.

Effective quarantine of a premises will require strict security to be maintained around the clock to ensure that only authorized personnel in protective clothing are allowed entry. It will be necessary to limit and supervise the movement of residents onto and off the property and to ensure that all pets are confined. Police and Army personnel should be mobilized to assist in controlling the movement of people in the quarantine area.

- a.) Primary Risk The greatest risk for spread of these viruses in commercial poultry is movement of personnel and equipment within the affected area.
 - Stop all unnecessary movement and control access to all farms and facilities where poultry are located.
- b.) Time factors - The most dangerous time for spread of virus will be from the initial infection until the disease is confirmed.
Least time expense. If spread of the virus can be stopped quickly and the infection burn itself out quickly, that will be the shortest amount of time and ultimately least amount of expense to becoming free of the disease.
- c.) Control Area – First aim is to stop all movement in largest controllable area, then reduce as rapidly as possible to the smallest area possible to maintain necessary control around infected flocks.

3.4. PRODUCT RESTRICTION

Most countries ban the importation of poultry and poultry products from infected countries or regions. Birds slaughtered for meat during an outbreak can be a significant source of virus, as the virus may remain infectious in bone marrow and muscle of slaughtered chickens for at least 6 months at -20° C and for up to 4 months at refrigerator temperature. The virus may also remain infectious for months at room temperature in eggs laid by infected hens and for a year at 4° C. Frozen poultry products can be a significant means of spread especially if uncooked poultry scraps are fed to poultry.

3.5. INTERNATIONAL TRADE ISSUES

A major impact of an outbreak will be international trade issues.

The goal is to quickly eradicate the disease and to satisfy the international markets and trading partners and re-establish trade, which means meeting OIE standards as well as the standards of the importing country.

Based on recent outbreaks, the effect of an outbreak on the international or regional export market of poultry and poultry products can be considerable.

Initially all export markets will close and will be reopened overtime once confidence returns that the outbreak has ended.

Export markets are usually affected by:

- (a) Length of time infection persists
- (b) Control of infected area
- (c) Desire of importing country to protect their domestic poultry industry
- (d) Ability of country to do without products
- (e) Economics

3.6 Activities for Control and Eradication of HPAI & END

3.6.1 Communication and Education

Ideally an education plan should begin prior to an outbreak. Communication and education plan should include the following people or groups:

(a) Target audience

- (1) Growers or poultry farmers including backyard poultry farmers and owners of any facility where poultry are kept or marketed.
- (2) Flock supervisors/ Field Officers. All flock supervisors and agricultural field officers should be given information on how to conduct themselves in the event of an outbreak of EPD. They should also be given relevant information about these diseases.
- (3) Company Officials
- (4) Feed Mill Operators, Feed Truck Drivers etc.
- (5) Hatchery Operators
- (6) Emergency Response Team (***Industry, Government***)
- (7) The General Public
- (8) The Press

(b) Educational materials

These should be done in simple language, should be available at all times and should be distributed to all potential stakeholders. Consideration must be given to those who may not be able to read. Both the poultry companies and the Ministry Of Agriculture can coloborate in providing these. Brochures about the diseases and question and answer fact sheets are also appropriate. Governments should consider the use of the media to inform the public about the potential dangers and threats posed by the entry of these diseases into the poultry population. Poultry population includes both commercial broiler or egg operations, back yard flocks, pet stores and markets where

poultry are sold. Information on the required bio-security practices is essential for the acceptance, implementation and successful outcome of a control programme. Failure to communicate and provide critical information or the presentation of inaccurate information to the media will reduce public trust in the safety and wholesomeness of all poultry products for human consumption.

3.7. QUARANTINE

Premises and zones shall be quarantined as set out below.

The Ministry of Agriculture has the legal authority by law to impose quarantine on premises or areas in the event of disease outbreak. Such quarantine is usually imposed on individual herds or flocks and premises when any foreign animal disease is suspected.

Infected Premises – A premises is defined as any premises where infected birds are located. Failure to stop the movement of infected or exposed birds from an infected premises may result in the spread of the disease agent in a very short time. A strict movement standstill on all infected premises is critical to halt the spread of the virus to other farms or areas. All efforts must be made to contain the virus on infected premises and to prevent the introduction of the virus to naïve premises. Movement of all birds, products and materials to or from an infected premises is strictly prohibited. Movements of authorized persons are only allowed following change of clothing and disinfection of footwear. If at all possible dead birds or birds that have been euthanized should be disposed of on the premises. Only essential vehicles are allowed onto an infected premises and they must be thoroughly disinfected before leaving. The police or army must provide round the clock security at an infected premises as long as live birds are there.

At Risk Premises – These are premises that are associated with an infected premise by being adjacent to infected premises.

Restricted Premises:- Infected premises, which have been depopulated and subsequently cleaned and disinfected.

- At risk premises after 30 days from the last arrival from or shipment to an infected premises, if there are no clinical signs or mortality indicative of infection.
- **Zones:** Infected and surveillance zones shall be established around the area of known infection.
- ***Infected Zones:*** the geographical area extending 10 kilometers beyond all known infected flocks. This area must be clearly defined taking into consideration the environment, ecological and geological factors

as well as the epidemiological factors and type of husbandry being practiced.

- **Surveillance Zone**

The geographical area extending 20 kilometers out beyond the periphery of the High Risk Zone.

- **Quarantine Zone**

The area included by both the Infected and Surveillance Zone.

3.8. **Movement Controls**

Control all movement of birds, equipment and people within the Quarantine Zone.

3.8.1 Area Restriction: Law enforcement (Police, Army) officials will have the responsibility for movement controls.

1. ***Premises Guards:*** Guards will be maintained 24 hours a day, 7 days per week on **infected and at risk premises**. After depopulation guards can be reduced to daylight hours only on either infected or at risk premises.

Guards can also be lifted after clearing and disinfection on an infected premise.

2. ***Perimeter Guards:*** Perimeter Guards will be maintained 24 hours a day, 7 days per week on the outer perimeter of the Quarantine Zone to restrict the movement of birds and bird related items.

Guard Reduction: Guards may be reduced to a daytime shift only on either infected or at risk premises after depopulation and burial of birds.

Guards can also be eliminated after cleaning and disinfection of facility on an infected premise, and can be removed from premises when classification is downgraded to restricted premises.

3.8.2. Company Restrictions

Poultry companies must withdraw:

Service personnel

Vaccination crews

Any other individual that would move from farm to farm.

3.8.3 Non-Poultry Entity Restrictions

- ***Utilities:*** Utility companies such as water and power companies should be contacted to make alternative arrangements for consumers within

the Quarantine Zone to read their own meters or have companies estimate usage during the period.

- Delivery companies i.e. mail, should also be contacted to make alternate delivery arrangement.

3.8.4 Owner/Grower Restriction

All persons including other farmers, owners or growers should be discouraged from visiting infected premises.

3.8.5 Litter Restriction

All clean out and spreading of litter must be suspended and encourage composting of all litter in house if possible.

3.8.6 Vaccination

Routine vaccination for other diseases by vaccination crews is to be suspended within the Quarantine Zone in order to limited traffic on and off the farms.

3.8.7 Vehicle Restrictions

1. A system of color-coded stickers should be used to identify vehicles and serve as an official permit for vehicle movement. These will be issued after an application has been filed and approved by the Veterinary Officer in charge or his nominee.

- *Red*: for vehicle within the infected zone
- *Yellow*: for vehicles moving between infected and quarantine zone.
- *Green*: on vehicles in the area outside the quarantine zone.

3.8.8 Zone Restrictions

1. ***Into Quarantine Zone*** – No new birds are to be allowed into the Quarantine Zone.

2. Within Quarantine Zone

- a. **Feed Trucks**: Feed trucks by necessity are allowed in and out of the Quarantine Zone. They should have a permit and be cleared and disinfected both ways. The driver must have no direct contact with poultry. Ideally the truck driver should not leave the truck.
- b. **Bird Transportation**: Bird transportation trucks will be issued a permit to carry birds straight to the slaughter plant. These trucks should be disinfected both ways.
Slaughter: All birds going to slaughter must be inspected within 24 hours of movement and have to be permitted.

Catch Crew: Biosecurity procedures will be heightened for all catch crew and their activities. These measures include the leaving of all working clothing on the farm, or the wearing of disposable coveralls, which are incinerated after use. Footwear should be thoroughly disinfected at the end of the catching operation.

Processing: If a slaughter facility is located in the *Quarantine Zone*, all birds going to the slaughter facility from outside the zone will be permitted in and all transportation vehicle will have to undergo cleaning and disinfection prior to being permitted out of the Quarantine Zone.

C *Egg Transportation*

Table and hatching eggs will have to be permitted out, be required to have clean new containers and/or flats, the eggs sanitized and all transportation vehicles will have to be cleaned and disinfected both ways.

3.8.10 *Out of Quarantine Zone*

- (a) *Infected Zone.* No poultry or animals or poultry product can leave the infected zone.
Vehicles, equipment and people may leave the infected zone if strict biosecurity procedures are observed. The wheels and undercarriage of all vehicles must be disinfected when leaving an infected zone.
- (b) *Surveillance Zone*
Non-susceptible livestock and poultry can move out of the surveillance zone only with the appropriate biosecurity procedures, such as cleaning and disinfection of vehicles.

3.9 *Surveillance*

3.9.1 *Grower Mortality*

- (1) Daily Checks - Companies will contact their growers by phone to track mortality/morbidity. Backyard flocks and markets must be visited daily so that the necessary information can be ascertained.
- (2) An inspection veterinarian who will conduct a detailed epidemiological investigation will visit any farm with increased mortality/morbidity.

3.9.2 *Farm Visits*

Active surveillance should be promptly initiated as soon as Avian Influenza or Exotic Newcastle Disease is suspected. Initially, at least, a sample of all domestic species

of birds that die in the restricted area should be checked for lesions and specimens submitted to the laboratory. Field surveillance examinations to farms, backyard farms and markets where live poultry are sold should seek to detect changes in flock health.

- ◆ **Epidemiological Investigation:** The inspector/veterinarian will visit only one commercial farm per day.

If no clinical disease is present on farms visited the veterinary inspector shall:

- Explain disease process to the grower or farmer or owner of the birds.
- Take diagnostic samples as needed and submit them to the laboratory.
- Review biosecurity procedures with grower or farmer or owner of the birds.

- ◆ *If clinical disease is present, the inspector shall*

- Explain disease process to grower
- Establish permanent 24/7 guard at farm
- Begin epidemiological investigation and trace back
- Determine best way for depopulation and euthanasia of birds
- Arrange for appraisal of flock
- Schedule depopulation
- Discuss cleaning and disinfection procedures
- Post visible quarantine sign at entrance to farm
- Clean and disinfect self, equipment, and vehicles when entering and leaving facility.

3.10 Epidemiological Investigation

Epidemiological field observations and the collection and analysis of accurate data are fundamental to the disease eradication process. The main objective of epidemiological investigation is to obtain facts that may serve as a basis for decisions regarding programme changes, evaluation and planning.

An epidemiological investigation should commence as soon as an EPD is suspected and ideally a questionnaire should be used to collect the information needed. A draft questionnaire/report is included in the appendix.

The epidemiological investigation should also provide information that would allow for the following:

- Tracing of birds and poultry products to identify the location and sources of all birds, products and other contaminated materials that have moved to or from an infected premises.
- Tracing the movement of poultry, vehicles and personnel from an infected or exposed premises.
- Tracing movement of service personnel such as feed delivery truck and vaccination crews.

- Tracing movement of poultry products from affected or exposed poultry processing plant. This involves tracing fresh, frozen or chilled poultry products from a poultry processing plant that might have received and processed infected or exposed birds.

3.10.1 Observation

Reliable observations and accurate data are fundamental to all scientific inquiries. The objective of an epidemiological investigation is to obtain facts that may serve as a basis for decisions regarding programme changes, evaluation and planning.

3.10.2 Questionnaires - Interview

Epidemiological investigation begins as soon as an EPD is suspected. Initial data collection should include;

- Species and age of birds affected
- Mode of transmission, mode of spread
- Geographical area affected'
- Possible exposure.

3.10.3 Data Collection

An epidemiological report should be completed by the investigating officer from the *field investigation report and laboratory submission report*

3.11 Dead bird Pick-up

Establish and publicize a dead bird pick-up service for pet birds, game fowl, game birds and backyard fowls.

- On Farm – Dead birds are to be double bagged and placed in metal or heavy plastic containers at entrance of property
- Courier – A courier service should be established to pick up, bag, label, disinfect and transport dead birds to the laboratory for diagnostic evaluation and disposal

3.12 Destruction of Birds

Efficient, humane procedures must be employed to kill birds, preferably without moving them from the site. Individual birds are relatively easily destroyed by neck dislocation. Options for euthanasia for large number of birds include the use of gases such as carbon dioxide, and nitrogen. Disposal options must be carefully considered and the method chosen will often depend on several factors such as the cost, the environment, availability of land space, and availability of the required equipment.

During destruction of birds, the dispersal of virus by airborne spread should be prevented by closing up sheds during the process.

Disposal options include:

- Burial on the farm. This is the best and probably the cheapest option if it can be achieved on the infected farm itself. It is best to minimize the distance that

infected material needs to be transported. Public Works Departments, the Army and other agencies will be able to offer support in this area.

- Incineration/Burning. This is a good method to dispose of infected material. However, incinerators are usually too small to burn large numbers of birds and they may not be available near the birds. Burning of small number of birds on the farm is an option that should be examined. Burning of large number of birds is an expensive method because of the high water content of carcasses and it may be environmentally unacceptable to the community.
- Rendering. Rendering plants may not have the capacity to deal with large number of birds. Another disadvantage is that infected materials may have to be transported over large distances thus increasing the risk of dissemination of virus.
- Composting. This is an effective way of dealing with manure and litter and can be undertaken within sheds or otherwise on site, thus overcoming the risk of dissemination of the virus during transport.
- Alkaline hydrolysis and bio-degeneration. This has been used effectively in some outbreaks but it is costly and requires the purchase of expensive equipment.
- Landfill. This requires available open land space preferable near or on the infected premises.

3.13 Recovery

- (a) Quarantine Releases: Thirty days after cleaning and disinfection of the last infected premises, the perimeter guards can be eliminated and repopulating of non-restricted farms may commence. Surveillance zone and Infected Zone quarantines may be removed.
- (b) Surveillance and monitoring. Surveillance and monitoring of the area and especially within the original surveillance and infected zone and on all Restricted premises must continue for a period of 5 months and will consist of:
 - Dead Bird Pick-up. Dead Bird pick-up will be done during the five months period with laboratory analysis done on any suspicious birds. Dead bird sampling of repopulated sheds is an efficient method for monitoring for the virus than placing sentinel birds in the buildings from the time of depopulation to the time of repopulation.
 - Any highly suspicious flock must be thoroughly investigated.

APPENDIX 1
EMERGENCY KITS CONTENTS

All field officers and poultry veterinarians should travel with the items in this list at all times and an emergency supply of these items should always be in storage at the Veterinary Department.

1. Copy of this procedure Manual
2. Boots - disposable and rubber
3. Plastic trash bags
4. Disinfectant
5. Boot brush
6. Bucket
7. Disposable coveralls
8. Disposable dust masks
9. Rubber gloves
10. Household aerosol insect killer
11. Disposable surgical caps
12. Hand sprayer
13. Specimen Collection bags (large and small)
14. Buffered formalin
15. Blood tubes (red top)
16. Needles, syringes
17. Rubbing Alcohol
18. Cotton
19. Permanent marker
20. Ice chest/Cooler
21. Poultry Post mortem kits
22. Pens and pencils
23. Notepad/Paper

APPENDIX 2
OIE DIAGNOSTIC REFERENCE LABORATORIES FOR AI AND NCD

1. National Veterinary Services Laboratory (NVSL)

Address Director's Office
1800 Dayton Avenue
P.O. Box 844, Ames, IA 50010
USA
Telephone number (515) 239-8301
Fax number (515) 239 8397
E-mail address nvslclient.help@usda.gov
Website: www.aphis.usda.gov/vs/nvsl/index.html

Secretary to the Chief, Diagnostic Veterinary Laboratory
National Veterinary Services Laboratory
Telephone number:(515) 663 7848
Fax: (515) 663 7348
Email address:Janine.C.Greenwood@aphis.usda.gov

2. Dr D. J. Alexander
Central Veterinary Laboratory
Weybridge, New Haw, Addlestone, Surrey
KT15 3NB, UK
Telephone number: 441932341111
Fax number: 441932347046
Email address: d.j.alexander@vla.defra.gsi.gov.uk

3. Dr. Ilaria Capua
Istituto Zooprofilattico Sperimentale della Venezia
Laboratorio Virologia
Via Romea 14/A, 35020 Legnaro, Padova
Italy
Telephone number: 39049 8084369
Fax number: 300498084360
Email address: icapua@izsvenezie.it

4. Dr. E. F. Kaleta
Institut für Geflügelkrankheiten der Justus Liebig
Universität Giessen
Frankfurter Strasse 91,
35392 Giessen
Germany
Telephone number: 496419938430
Fax number: 49641205148
Email: erhard.f.kaleta@vetnmed.uni-giessen.de

APPENDIX 3
SPECIMEN SUBMISSION TO REFERENCE LABORATORIES

Packaging of samples for transport

1. Label all samples of tissues, swabs, serum or yolk with indelible ink pens or water-resistant ink pens.
2. Vials and containers should **not** be more than half full.
3. Lids and caps of vials or containers should be securely fastened and sealed with moisture repellent tape wrapped in the opposite direction to the cap threading.
4. Each of the vials or bags should be individually wrapped with a sufficient amount of cotton to assure the absorption of all fluids if breakage occurs.
5. The vials or bags should be placed in a rigid secondary container such as a clean empty can.
6. Samples must be left chilled or frozen during all the stages of the packaging process. The samples should be placed in the shipping container with pre-frozen coolant packages.
7. A separate submission form must be submitted for each owner or premises. Two copies of the legibly completed forms should accompany the shipment.
8. A valid import permit issued by the reference laboratory must accompany samples. (Veterinary departments should have valid copies of such permits in place at all times)

Transport of samples

1. Send packages via the quickest route. If samples are being sent to the NVSL in Ames, Iowa USA, notify the Chief of Diagnostic Veterinary Laboratory by phone (515- 239 8266) of the airway bill number or identifying information and the estimated time of arrival.
2. All containers should be sponged and cleaned with an approved disinfectant.
3. Check with the airline agent for any transport requirements ahead of time and be sure to comply with local and international policies and regulations.

APPENDIX 4
SAMPLE OF QUARANTINE SIGN

(Sample Of a quarantine Sign to be used as soon as suspicion of an outbreak of AI or Newcastle Disease is made. Veterinary Departments should have these in storage at all times.)

Farm Under Quarantine

Animal Disease Outbreak

Infected Premises

Keep Out

By order: Ministry of Agriculture.

APPENDIX 5

**(List of some approved disinfectants for END and HPAI
The list is far from exhaustive and new effective compounds are being placed on the
market at a rapid pace.)**

1. Alkalis
 - Sodium Carbonate
 - Sodium hydroxide
2. Halogens
 - Chlorine
3. Phenolic Compounds
4. Glutaraldehydes
5. VikronS
6. Formaldehyde gas (to decontaminate electrical equipment)

APPENDIX 6
EPIDEMIOLOGICAL INVESTIGATION REPORT/QUARANTINE

(This form should be used for basic data collection. Other questions can be added as deemed necessary by the investigator.)

1. Have any birds been sick within the last 30 days? (Yes or no) If yes, give:
 - A. Dates
 - B. Number and species of birds
 - C. Name of owner and place of origin of the birds
 - D. Any medication
 - E. Any vaccination

2. Have any birds moved onto the premises within the past 30 days? (Yes or no) If yes, give:
 - A. Reason for movement
 - B. Dates
 - C. Number and species of birds
 - D. Method of transportation
 - E. Birds health or condition

3. Have any birds been moved off the premises within the past 30 days? (Yes or no) If yes give details as in 2.

4. Do farm employers live on other farm? (Yes or no) If yes, give:
 - A. Location of farm
 - B. Number and kinds of birds maintained
 - C. History of acquisition, movement etc.
 - D. Places visited by employee and contacts.

5. Are the premises located near other poultry farms or premises where poultry are kept? (Yes or no) If yes, give:
 - A. Relative location
 - B. Distance
 - C. Description

6. Have the birds been vaccinated or immunized in the past year? (Yes or no) If yes, give:
 - A. Kind of vaccine used and manufacturer
 - B. Number of birds vaccinated
 - C. Serial and lot number of vaccine if known

7. Classify the premises as to:
 - A. Standing water - ponds, lakes
 - B. Flowing water – irrigation, canals, rivers
 - C. Recent flooding
 - D. Mountain streams and forests

8. Classify the terrain as to:
 - D. Valley
 - E. Plateau
 - F. Hills
 - G. Mountain
 - H. Plains
 - I. Other

9. Identify the vegetation and trees and their location with relation to topography of the premises about diseases and vector breeding sites.
10. Give drainage conditions
 - A. To other farms
 - B. From other farms

11. What is the direction of the prevailing winds?
12. Identify sources of water supply to the birds
13. List wild life evident or known to be present, such as:
 - A. Wild birds
 - B. Wild waterfowls
 - C. Deer
 - D. Wild hogs
 - E. Mongoose
 - F. Other

14. Are rats and mice...
 - A. plentiful
 - B. moderate
 - C. few
15. How is feed stored and provided?
16. Describe handling of bags and sacks containing feed.
17. Have any member of the family, employees and their families or neighbors received food from a foreign within the past year? (Yes or no)
18. Have any foreign residents visited the family, employees and their families within the past year or have they received food from a foreign country? If yes:
 - A. Identify the person and date.
 - B. Identify the food and explained what happened to it.
 - C. Identify the country of origin.

19. Are any members of the family or any of the employees family employed off the farm? (Yes or no) If yes indicate if it is:
- A. A. On another farm
 - B. In a slaughter house
 - C. In a rendering plant
 - D. In a meat market
 - E. Other
20. List names, locations, and dates of visits within the past 3 to 4 months.
- A. Poultry servicemen
 - B. Extension officers
 - C. Equipment repair persons
 - D. Feed delivery persons
 - E. Neighbors
 - F. Other
21. Have the services of a veterinarian been used within the past 6 months? (Yes or no) If yes,
- A. Identify by name and address
 - B. Reasons for visit
 - C. Result of visit
22. Is vector control practiced on the farm? (Yes or no)
24. Is manure or other animal material from outside brought onto the premises? Yes or no) If yes indicate source and location, use and method of transport.
25. How is garbage disposed off?
26. Do farm employees own or have pet birds?
27. Do farm employees attend or participate in cock-fights? If so when and where.
28. Is labour and or equipment shared with neighbors? If so who when and where.
29. What is the schedule for feed delivery and who delivers it?
- 30.** What is the schedule for egg pick up, by whom, type of flats, cases racks?