

POLICY FOR HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI) SURVEILLANCE

1. Introduction

Avian Influenza or bird flu is a zoonotic viral disease affecting different bird species and mammals including man. Epidemiological evidences suggest that the virus dissemination is attributed to two important pathways namely through migratory birds and commerce of poultry and poultry products from infected country. Ethiopia being a country with diversified ecology, water resources situated along East Africa West Asia, Black Sea Mediterranean flyways, it is considered as one of the high-risk countries for HPAI.

Besides, Ethiopia's traditional extensive poultry production (out door scavenging low input system) representing 98% of the national flock, operates in an environment exposed to contamination by migrating and resident wild birds. Ethiopia also imports exotic breed poultry for use in commercial sectors and government owned multiplication centers.

Efforts for HPAI early detection, diagnosis and control heavily rely on the effectiveness of and capacity for surveillance. As a country with a predominantly backyard poultry production system, and risks associated with importation for commercial and multiplication farms, it is imperative to put in place an appropriate policy framework and workable guidelines to support the effectiveness of a comprehensive disease reporting and surveillance functions.

2. General objective

The general objective of the policy is to provide robust support to a sound HPAI surveillance mechanism that fosters early detection of the disease, outbreak containment and disease management as well as to pave ways for the implementation of subsequent disease control measures..

3. Specific objectives

The specific objectives of the surveillance policy are:

- To create a conducive policy environment for the implantation of the national Medium Term HPAI preparedness and response action plan
- To provide a comprehensive HPAI surveillance framework with specifications and requirements relevant to the different production systems
- To support an early warning and reporting of the occurrence of HPAI in different parts of the country
- Determine the distribution pattern and magnitude of impact of outbreaks of HPAI
- To support the national HPAI prevention, disease management, control and eradication strategies
- To create an in built monitoring and evaluation system governing HPAI surveillance activities in Ethiopia.
- To clarify the complementarity of a comprehensive surveillance framework with all other required activities for HPAI diagnosis and disease management and related control measures.

4. Major requirements

- 4.1. Availing an epidemio-surveillance capacity for feasible HPAI surveillances both at the Federal and Regional levels.
- 4.2. Strengthening the avian influenza diagnostic capacity both at the national referral and regional veterinary laboratories through provision of tailor-made technical training and supply of the necessary inputs and supplies.
- 4.3. Establish a functional laboratory and epidemiological network, effective information exchange platforms.
- 4.4. Put in place a dynamic database systems for recording, managing and analyzing national HPAI surveillance and diagnosis datasets as well as knowledge management (KM) systems
- 4.5. Provision of adequate budget and logistics

5. Actors in HPAI surveillance system

The national HPAI surveillance system will involve the following actors who will play pivotal roles in organizing, implementing and monitoring of activities in different regions up to the grassroots levels

- The Federal Animal Health Department, MoARD and the Federal Emergency Operation Center (NEOC)
- The regional bureaus of agriculture and regional EOCs.
- The National Animal Health Research Center (NAHRC)
- Regional veterinary laboratories
- Field animal health services in the regions with their structure extended to woreda level
- NGOs dealing with livestock and poultry issues

5. HPAI surveillance components

5.1 Early detection

Conducting systematic regular surveillance activities as a prerequisite measure is useful to determine the situation of HPAI in order to provide early warning of infection and incursion of the virus in a particular locality or production sector. As far as the current AI state of Ethiopia is concerned, the disease is not reportedly introduced into the country. The occurrence of the disease is, however, reportedly confirmed in the neighboring Sudan and Djibouti.

Given the risk of disease introduction either from neighboring countries or through importation of chicken or through other means including migratory birds, the national comprehensive HPAI surveillance for Ethiopia will have the following targets:

- Control of boarder areas and international entry points
- Regular assessment of the situation in domestic poultry, both in the intensive and backyard production systems
- Assessment on the occurrence of unusual mortality in wild birds
- Inspection of live bird markets in both urban and rural settings and along the value chain

A two way information flow (bottom up and top-bottom) approach needs to be adopted in HPAI surveillance and reporting system. Any situation presented with high mortalities in poultry and any wild birds could be due to HPAI and must be reported immediately for early detection (see annex

for flow chart) to either of the following: nearest woreda animal health or agriculture offices, or regional agriculture bureau, or regional EOC, or regional veterinary services, Federal EOC (MoARD), NAHRC, or AHD (MoARD), International Organizations, NGOs, etc.

The responsible veterinary team, as assigned by the regional EOC will be mobilized to a designated HPAI suspected outbreak scene, collect laboratory samples, undertake screening tests (as appropriate at a regional level) and/or submit the samples with required details to the NAHRC for confirmatory diagnosis. If necessary, NAHRC, as per the prescribed procedure, will then decide to send the suspected AI sample to an international referral laboratory. Cognizant of the fact that the speed of reporting on laboratory diagnostic outcome decides the rate of implementation of AI outbreak containment and related measures, the regional and/or national referral laboratories must communicate any laboratory findings to relevant bodies within 48 hours.

5.1.1 Surveillance in border areas

The following methods allowing detecting introduction of poultry and poultry products and potentially contaminated material originated from potentially/known HPAI infected localities:

- Inspection of vehicles or other transportation systems carrying dead or sick, or apparently normal looking poultry
- Surveillance of live bird markets
- Targeted surveillance in commercial farms and multiplication centres
- Targeted surveillance of backyard poultry

5.1.2 Targeted surveillance of poultry

This could be implemented based on the strategic decisions borne in the National HPAI Preparedness and Response Plan. Two possible scenarios for effective and comprehensive surveillance undertaking include:

A. Commercial Poultry where AI vaccination program to be implemented, or started, or completed

- The concerned laboratory must undertake a monthly vaccine efficacy assessment by serological testing and monitoring of the health of the sentinel population.
- The farm is required to report to veterinary authorities any incident of bird death among the unvaccinated sentinel.

B. Backyard poultry production system

Targeted retrospective surveillance on the backyard poultry in unvaccinated poultry could give a clue on the circulation of H5 subtype. In case of serological prevalence among the unvaccinated population, the surveillance team conducts sampling (cloacal swabs) for evidence of AI virus circulation.

5.1.3 Surveillance of dead wild birds

Unusual mortalities in wild birds could be due to HPAI. Therefore the AI surveillance encompasses these species, sample has to be collected for virus detection.

5.2. Surveillance in AI containment zone

Ring vaccination of poultry around a stamping out zone (5km radius from the outer skirt of the culling zone limit) is stipulated in the National AI Preparedness and Response plan. Targeted surveillance in AI outbreak containment zone within the vaccination and around vaccination zone must be undertaken. A monthly monitoring of the sentinel flocks, serological and AI monitoring should be conducted until freedom from infection is achieved.

Annex 1. Avian influenza case identification

- Sudden death in chicken and any wild bird species
- High mortality in chicken and any wild birds (Daily mortality of 1% for 2 days)
- Nasal discharge
- Difficulty in breathing
- Red colouration of legs
- Oedema of the head
- Conjunctivitis (with or without)
- combs and wattles are cyanotic and oedematous, with petechiae or ecchymotic haemorrhages at their tips
- Haemorrhages may be present in unfeathered areas of skin
- oedema of face and neck
- neurological signs such as torticollis, ataxia
- diarrhoea

Annex 2. Sampling

A. Sample size

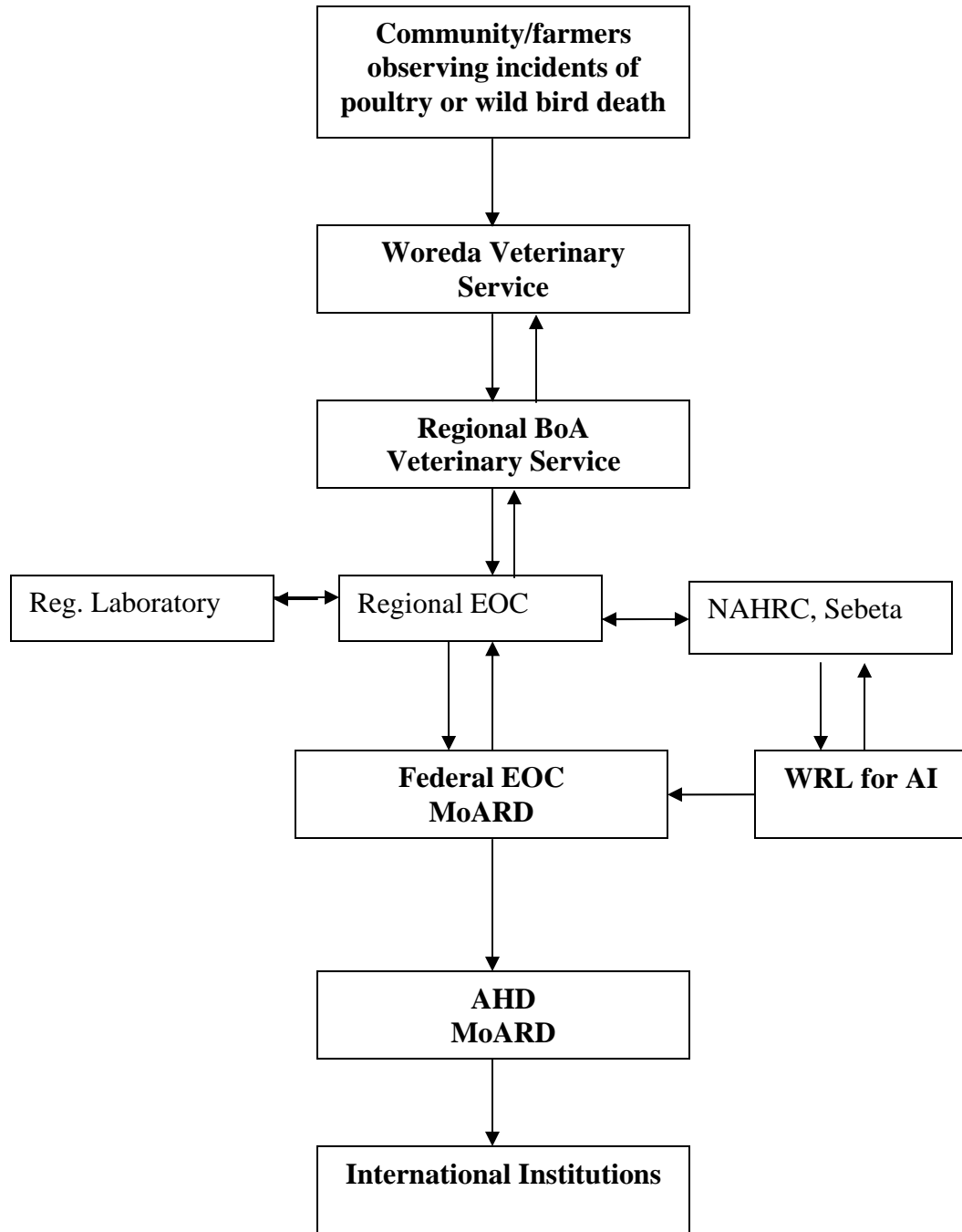
1. For serological surveillance sample size is determined to achieve a 95 % probability level. Thus, with expected prevalence of 20%, collect 14 sera sample from a flock of 500 chickens.

2. For virological investigation at 95% probability level with expected infection rate of 2% collect 100 swabs from a flock of 500 chickens (a pool of 5 swabs per vial).

B. Sample handling and preservation

Sample collection and handling should be performed in accordance with the Standard Operating Procedures (SOPs) recommended by the OIE.

Annex 3. Information Flow Chart



POLICY FOR THE DIAGNOSIS OF HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI)

1. Introduction

Highly Pathogenic Avian Influenza (HPAI) infection in birds give rise to a wide variety of clinical signs that may vary according to the host, strain of virus, the hosts immune status, presence of any secondary complications and environmental conditions. Thus, confirmatory diagnosis of HPAI is realized by way of laboratory investigation using standard diagnostic tests and procedures recommended by the International Office for Animal Health (OIE). Diagnosis of HPAI and timely communication of finding is critical in view of:

- safeguarding the public
- providing continued support to the comprehensive surveillance network and functions
- deciding the scope, timing and promptness of control interventions to curtail the spread of viruses
- determining the subsequent exit strategy and activities to be taken during the aftermath of HPAI outbreaks, including restocking time, type of surveillance, etc
- defining the national HPAI status and communication the same to all relevant national, regional and international organizations/bodies etc

Ethiopia is currently in the process of finalizing its medium term national HPAI medium term preparedness and response strategic plan. The need for a comprehensive HPAI diagnosis policy is, thus, legitimately justified.

2. Policy components

The national HPAI diagnosis policy will consist of the following components:

- 2.1. Strengthening institutional, manpower and facility resources capacity at both federal and regional laboratories through tailor-made technical trainings, group training and institution of quality assurance (QA), quality control (QC) and standard operational procedures (SOPs).
- 2.2. Setting of Initial AI screening test capacity at regional veterinary laboratory level including rapid direct antigen detection tests, immunofluorescence test, etc., and a system of standard and timely reporting of findings and rapid shipment of laboratory specimens to the national referral laboratory at Sebeta
- 2.3. Developing a full-fledged capacity for HPAI confirmatory diagnostic tests at the National Referral Laboratory enabling the isolation of HPAI viruses on embryonated eggs, haemagglutinin typing, neuraminidase typing, gene sequencing by reverse transcriptase PCR (RT-PCR), serological assays to detect antibodies directed against matrix antigens of the AI virus (AGID), using subtype specific HAI, and A group specific ELISA
- 2.4. Defining the roles of laboratories (federal and regional) in providing technical supports to the various HPAI prevention and control programs and the services required in different poultry production sectors and hazards.
 - Avian Influenza diagnostic services to vaccinated poultry populations
 - Commercial Poultry farms/ multiplication centers
 - Backyard chicken comprised in ring vaccination
 - Avian Influenza diagnostic services to unvaccinated populations
 - Specimens coming from suspected HPAI outbreaks in poultry and wild birds
- 2.5. Devising and instituting a system of shipment, follow up and reporting of findings with respect to:

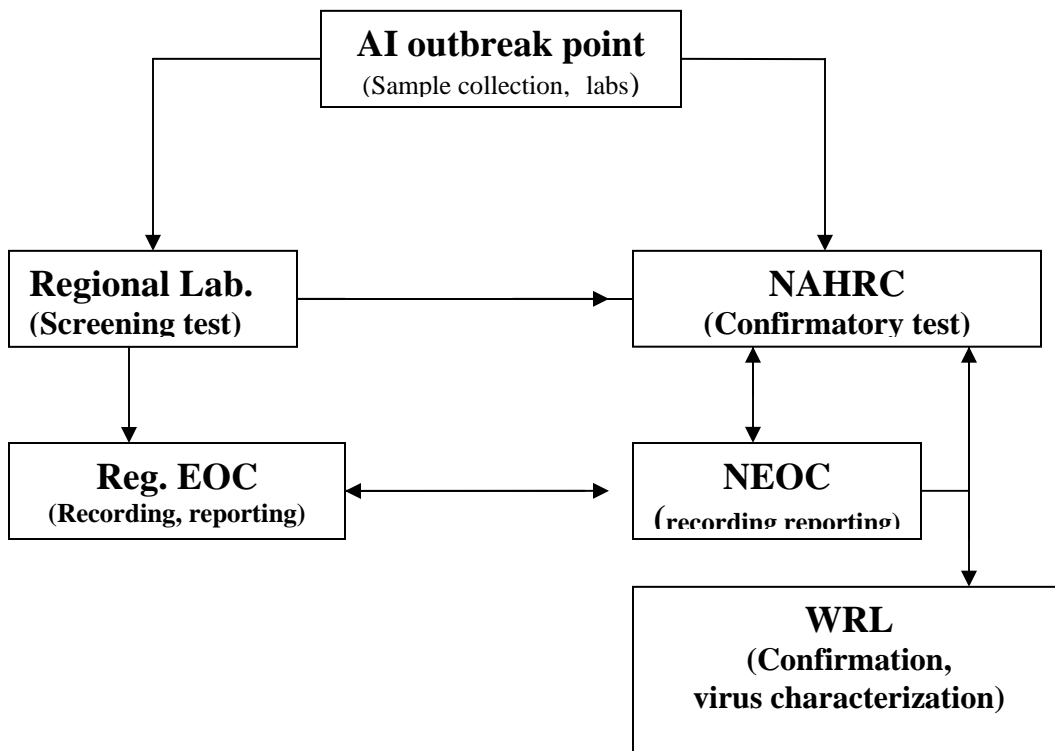
- Laboratory samples to be sent out from regional veterinary laboratories, which may or may not be subjected to primary screening tests, to the national referral laboratory at Sebeta
- Laboratory samples to be sent out to OIE-accredited international referral laboratories. This is particularly essential when initial OIE confirmation on disease introduction to the country is required and when investigation of viral incursion in a vaccinated population is detected and genetic analysis for the presence of a mutant variant is required.
- Defining the maximum duration for proper and timely communication of laboratory findings for effective implementation of HPAI containment, disease management and other control interventions

2.6. Setting of functional and sound networking amongst regional veterinary laboratories and with the national referral laboratory at Sebeta

2.7. Developing a strategy and implement a dynamic laboratory diagnostic database system allowing standard data collection, entry, collation, management and analysis. A sustainable system of knowledge management (KM) and knowledge sharing (KS) will be the ultimate goal of the devised system.

1. The laboratory network and the tasks

The following laboratory information, diagnostic activity and sample shipment to laboratories at different level is suggested for efficient delivery of the diagnostic services.



POLICY FOR THE DISPOSAL OF CARCASSES AND POTENTIALLY INFECTIVE MATERIALS

1. Introduction

Decontaminating infected farms and removing or disinfecting potentially infectious material is critical to effective disease control. The methods used must prevent spread of infection, have minimal impact on the local environment and must be acceptable to environmental protection agencies. The main methods used for disposal of carcasses and other materials are burial, burning and composting. Amongst these options, burial is the appropriate method of choice for Ethiopia.

2. Objective

The main objective of disposal of culled poultry and contaminated materials is to remove all materials harboring HPAI virus on time in a bio-secure and environmentally acceptable manner, and to clean and disinfect infected places and equipment for restocking.

3. Major activities

The following core activities will be executed prior and during the disposal process:

- Strengthen the capacity to enforce preventive and control measures through disposal of culled poultry and contaminated materials through provision of tailor-made training for personnel to be involved in culling and disposal processes.
- Remove all materials harboring HPAI virus on time in a bio-secure and environmentally acceptable manner, and to clean and disinfect infected places and equipment for restocking.
- The CCC organizes the preparation of disposal sites and facilitates the smooth implantation of carcasses and infected material disposal, and cleaning and disinfection of the premises as well as other safety measures to be put in place.

4. Recommended methods of disposal

The following considerations are made for the disposal of carcass and contaminated materials depending on the type of production system and feasibility matching with the reality on the ground:

- For backyard farming systems, disposal will be implemented at an identified appropriate culling site by burial.
- For semi-intensive and intensive farming systems, it is preferable to dispose of carcasses on farm, providing that there is a suitable site for burial.
- It is important to avoid contamination of water supplies, for reasons of animal, public and environmental health.

- Relocation of carcasses to another site creates an additional risk to farms along the route between the infected farm and the site of disposal.
- For bio-secure transport, carcasses must be placed in leak proof containers or sealed in plastic bags. Vehicles carrying carcasses must be leak proof.
- The rate of depopulation of farms must be monitored to avoid a build up of carcasses, which will occur if flocks are destroyed more quickly than carcasses can be removed. This may present problems, especially when depopulating multiple farms and using off-site burial. Under these circumstances, it usually takes less time to kill birds than it does to remove the carcasses. Carcasses are easier to handle before decomposition has set in.
- Composting of carcasses in combination with faeces and litter is another acceptable means of disposal if burial may not be feasible.
- Faeces and litter are most readily dealt with by burial or composting. The material should be piled up in a secluded part of the farm, the surface disinfected and the stack covered with plastic or other suitable material.

5. The burial process

Burial is best undertaken at the infected site. It is best to minimize the distance that infected material needs to be transported. A burial place outside infected premises may be the best option in situations where a number of infected foci would have to be depopulated and decontaminated in a given area and where a common burial site would be more efficient. The preferred equipment for digging burial pits, at least in modern farms, is an excavator. This equipment is the most efficient available for the construction of long, deep, vertically sided pits. Other advantages include the ability to easily store topsoil separate to subsoil and the equipment can be used if required to fill the pit with carcasses or other materials and closing the pit without disturbance of the carcasses. Loaders, bulldozers, road graders and backhoes (for small jobs) may be used if excavators are unavailable. With the exception of backhoes, all other equipment requires the continual movement of the machine over the site while digging the pit. Excavators and backhoes essentially remain in a fixed position while digging; hence they move soil faster, with less cost and less damage to the site surrounding the pit. Most excavators have an attachable hammer for rock work if necessary. The dimensions of the burial pit will be dependant on the equipment used, site considerations and the volume of material to be buried. The preferred dimensions are for pits to be as deep as practically possible (reach of machinery, soil type and water-table level being the usual constraints), with vertical sides. However for the backyard poultry production system simple hand tools can be used to digging a 2 x 2 m deep pit.

6. Cleaning and disinfection

Cleaning and disinfection of infected places and equipment are a crucial part of control strategies for avian influenza:

- This should start with an initial dry cleaning (scraping and carting away faeces, litter, feed and other organic material) followed by preliminary disinfection (e.g. by spraying an appropriate liquid disinfectant). More thorough cleaning and a second round of disinfection should follow this.
- Items that cannot be properly disinfected should be destroyed. Influenza viruses can survive for some time in organic material, so thorough cleaning with detergents is an important step in decontamination.
- All organic matter must be removed from poultry houses. Effective cleaning results in no visible feathers or faeces remaining in the shed.
- Many disinfectants are effective against AI viruses, including detergents, hypochlorites, alkalis, glutaraldehyde, and Virkon®. The chemical chosen depends largely on the nature of the material being disinfected. Vehicles should not be disinfected with corrosive chemicals.
- Care needs to be taken when using disinfectants to balance the need to destroy the virus with the adverse environmental effects associated with excess use. Outdoor areas used by poultry can be difficult to disinfect, especially if these include vegetated areas or earth.
- Poultry should be excluded from these areas for a minimum of 60 days (2 months) to allow natural ultraviolet radiation to destroy any residual virus. The period of exclusion should be longer in cold weather.
- Spraying of disinfectants on vegetated outdoor areas or soil is of limited value due to the inactivation of these chemicals by organic material. Removal of surface soil is not normally recommended unless it is heavily contaminated with faeces.
- Farms that have been cleaned and disinfected should be subject of an official inspection before restocking is permitted. Restocking should not occur less than 60 days following completion of cleaning and disinfection after de-stocking.

7. De-stocking period

After culling, disposal and decontamination procedures have been completed; the premises must be left without susceptible species (de-stocked) for a period of time, determined by the estimating survival time of the pathogen in the particular environment. Normally, restocking should not take place until at least 21 days after satisfactory cleaning and disinfection has been completed and the outbreak has been brought under control in the area. However, under Ethiopian condition, it is believed that it is safer to relax the time needed for restocking to 60 days Restocking should be undertaken by introducing a small number of poultry first, and these monitored daily for signs of

disease. Should this occur, notification to the authorities must be immediate and sampling of the sick or dead birds done to determine the cause. If the poultry remain healthy, full repopulation can be carried out. Improvement of bio-security should be instituted at all stages of production to decrease the likelihood of AI or other diseases entering the recovered premises. After repopulation, monitoring should be continuous through the sampling of dead birds to determine whether re-infection has occurred.

8. Minimum personnel and material requirements

When an outbreak of AI is confirmed a minimum of 5,000 chickens will be culled and disposed with in a day in the 3km radius around an outbreak scene. For this purpose the minimum number of personnel required is estimated at 10 animal health assistant or animal health technician or development agents divided in two teams (5 person/team). The list of materials required include protective gears for 10 individuals, adequate amount of calcium hydroxide, disinfectant, first aid kits, equipment for digging burial pits and materials for fencing.

9. Specific guidelines

With due consideration of the Ethiopian situation, the following guidelines are recommended methods for disposal of carcasses and infective materials as well as disinfection of contaminated premises

9.1. Burial

- Done in a bio-secure and environmentally acceptable manner
- The methods used must prevent spread of infection
- During disposal of carcass attention must be paid to selection of disposal site depends on the availability of sufficient top soil, water drainage, prevailing wind condition and separation from sensitive public sites
- It should preferably be conducted on site, avoid transportation (source of contamination)
- Vehicles carrying carcasses must be leak proof and carcass must be placed in leak proof containers or sealed in plastic bags
- The steps in the burial process consists of:
 - Digging a hole with a dimension of 2m³ (2m wide, 2m deep) (good for 300 birds)
 - Add calcium hydroxide to bottom and sides of hole
 - Add poultry and non-disinfectable objects, and biodegradable material
 - Cover with a layer of calcium hydroxide
 - Cover with a layer of soil of at least 40cm

- The entire process should be monitored by the local qualified veterinary personnel and the CCC

9.2. Cleaning and disinfection

The disinfection of poultry housings requires strict adherence to the following procedures:

- All organic matter must be removed from poultry houses
 - Initial dry cleaning (scraping and carting away faeces, litter, feed and other organic material)
 - Items that cannot be properly disinfected should be destroyed (see above)
- Followed by preliminary disinfection (using disinfectant – see below)
- Allow resting for 1 week
- Second round of cleaning and disinfection
- After 3 weeks new animals can be introduced
- The local qualified veterinary personnel should monitor the above activities.

In the case of backyard poultry, all organic matter must be removed from poultry houses

- Wait 60 days to allow natural ultraviolet radiation to destroy any residual virus (the period of exclusion should be longer in cold weather) before re-stocking.

9.3. Cleaning/disinfection agents

1. Virkon - prepare according to the manufacturer instructions -final concentration of 1%
2. Sodium hypochlorite - 2% active chlorine solution (disinfection of equipment)
3. Quaternary ammonium compounds - 4% solution (walls, floors, ceilings, equipment)
4. Calcium hydroxide - 3% solution (walls and floors)
5. Cresolic acid 2.2% solution (floors)
6. Synthetic phenols - 2% solution (floors)
7. Formalin and permanganate – fumigation
8. Ethanol – 70% final concentration disinfection of hands (also good for flaming after is advisable) small objects and instruments used for sample collection;
9. Citric acid – final concentration of 2-3%
(Other products are available)

Annex 1. use of disinfectant chemicals

Item to be disinfected	Disinfectant/chemical/procedures
<ul style="list-style-type: none"> ○ Live birds ○ Carcasses ○ Animal housing/equipment ○ Humans ○ Electrical equipment ○ Water ○ Feed ○ Effluent, manure ○ Human housing ○ Machinery, vehicles ○ Clothing 	<ul style="list-style-type: none"> ○ Euthanase (carbon dioxide gas; dislocation of neck) ○ Bury or burn ○ 1, 2, 3 (<i>See key below</i>) ○ 1 ○ 5 ○ Drain to pasture where possible ○ Bury ○ Bury or burn; 4, 3 ○ 1, 2 ○ 1, 3 ○ 1, 2, 3
<p>Key</p> <ol style="list-style-type: none"> 1. Soaps and detergents: leave in contact for 10 minutes 2. Oxidising agents: <ol style="list-style-type: none"> a. Sodium hypochlorite: liquid, dilute to final 2-3% available chlorine, not good for organic materials. 10-30 minute contact time. b. Calcium hypochlorite: Solid or powder, dilute 2-3% available chlorine (20 g/litre powder, 30 g/litre solid), not good for organic materials. 10-30 minute contact time. c. Virkon®: 2% (20 g/litre). 10 minutes contact time. 3. Alkalis: (do not use with aluminium and similar alloys) <ul style="list-style-type: none"> ○ Sodium hydroxide (NaOH): 2% (20 g/litre). 10 minute contact time. ○ Sodium carbonate anhydrous (Na₂CO₃ .10H₂O): 4% (40 g/litre from powder, 100g/litre from crystals), recommended for use in presence of organic materials as above. 10-30 minute contact time. 4. Acids: <ul style="list-style-type: none"> ○ Hydrochloric acid (HCl): 2% (20 ml/litre), corrosive, use only when other chemicals are not available ○ Citric acid: 0.2% (2 g/litre), safe for clothes and body decontamination. 30 minute contact time. 5. Formaldehyde gas: Toxic, only if others cannot be used. 15-24 h exposure time. 	

POLICY FOR VACCINATION OF POULTRY AGAINST HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI)

1. Introduction

Vaccination of poultry against highly pathogenic avian influenza (HPAI) could be regarded as a support tool for disease prevention and control strategy and may be considered when the disease has spread to such an extent that it has overwhelmed the resources of disease control authorities or the economic cost of a widespread slaughter campaign can no more be affordable. It can also be considered at an earlier stage when disease is introduced in neighboring countries and the risk of its introduction is perceived to be high. FAO and OIE have made recommendations for the use of OIE-approved AI vaccines, and several such vaccines are currently commercially available. If used in accordance with FAO/OIE recommendations (*FAO Position Paper, September 2004*) and the OIE Manual for Diagnostic Tests and Vaccines for Terrestrial Animals, these vaccines provide excellent protection against AI infection and clinical disease in chickens by reducing mortality and production losses. Vaccination of poultry also reduces the viral load in the environment both in time and titer, and thereby decreasing the risk of transmission to poultry and humans. According to current OIE recommendations, HPAI-vaccinated poultry are not excluded from international trade, although specific technical guidelines must be followed to ensure that the vaccine is being applied properly and monitored effectively. Vaccination, when it is applied, must be done in combination with other disease control measures, including culling of poultry, disinfection of contaminated premises, destruction of feed stuff, poultry products and other materials, movement control, market restrictions, intensification of bio-security, etc... Efforts to control the disease by vaccination alone, without these measures, will probably not be successful. It is therefore imperative to ensure the proper implementation of HPAI control measures through vaccination along with the implementation of other disease control interventions.

The national AHI Technical Committee approved the use of vaccination in the combat against HPAI. Depending on the incidence and distribution of outbreaks, vaccination may be undertaken around outbreaks (ring vaccination) in order to prevent further spread of infection to other localities and in identified high risk areas, particularly where poultry population density is high (semi-intensive and intensive farms) (targeted vaccination). Designing a vaccination policy stipulating all procedural and management issues with clear modus operandi was thus legitimately justified.

2. Objectives

The main objectives of poultry vaccination against HPAI are:

- to ensuring protective immunity status of the country's poultry population through ring vaccination around outbreaks and targeted vaccination in commercial and multiplication centres and thereby reduce the production losses caused due to the disease,
- to reduce the risk of spread of AI virus to animals and humans by reducing the shedding of viruses into the environment,
- to create barriers between infected and free areas (compartments) and to help in the control and eradication of the disease.

3. Major activities

- Import and systematically stockpile of certified AI vaccines to be used within three years period
- Strengthen vaccine storage and cold chain facilities for effective vaccination
- Strengthen the capacity for administration of poultry vaccination
- Design and institute active surveillance plans to monitor the farms or localities where AI vaccination is practiced
- Develop an exit strategy

4. Poultry vaccine type to be used in Ethiopia

Current vaccines use whole inactivated whole H5 virus antigen in an oil-based emulsion adjuvant produced according to OIE recommendations. The inactivated virus has the H5 haemagglutinin subtype which acts as the major antigen conferring protection against all H5 viruses. If vaccine is used with a different neuraminidase antigen (eg H5N2 vaccine used against H5N1 field virus), serology can be used to differentiate the response to vaccination, compared with infection. The National AHI Technical Committee, therefore, recommended the use of OIE certified conventional inactivated heterologous vaccine (i.e. H5N2) in Ethiopia.

5. Vaccination modalities

All chickens will receive three doses of H5N2 vaccine, the first two doses with 30 days of interval followed by the third booster dose after 6 months. The following vaccination modalities will be adopted.

5.1. Targeted vaccination

- Poultry in commercial farms and multiplication centers are considered as sites for mandatory targeted vaccination.
- A small proportion of leg tagged birds (2-3%) are left as unvaccinated sentinel population (OIE recommendations - DIVA strategy) to serve as a yard stick to check the effectiveness of the vaccination program and assess the presence of circulating (encroached) HPAI virus in that facility.
- Broilers will not be considered in this vaccination program, mainly due to their shorter production cycle, unless the purpose of vaccination is for disease eradication after endemicity has been established.
- Unvaccinated identified sentinel birds must be permanently identified (leg/wing tagged), placed in the vaccinated flock.
- There must be a monitoring system in place to assess the effectiveness of vaccination and to check the overall AI status of the flock (see the Flow Chart below).
- This vaccination modality will be implemented with cost sharing (only cost of vaccines).

5.2. Ring vaccination

This is a vaccination modality to be adopted in response to an outbreak in a radius of 5km around a 3 km culling zone. Depending on the human and poultry density, vaccination activity in the area the 5km buffer zone could shrink (low density) or expand (high density).

6. Vaccine administration

The following items should be carefully considered and implemented in the process of vaccine administration by the vaccination teams, basically composed of veterinarians, technicians and assistants ('vaccinators'):

- The vaccination teams must be trained in both the vaccination procedures and appropriate personal protection measures including the correct use of personal protective equipment (PPE).
- Team members should follow manufacturers' recommendations on the storage, delivery and administration of vaccines.
- Team members should ensure that detailed records of vaccination (number and species vaccinated, location, date, identification numbers of sentinel birds etc.) are recorded and entered in relevant database system for analysis..
- Vaccination team members should also be well trained in bio-security measures to ensure they follow appropriate cleaning and disinfection procedures that minimize any risk of their spreading AI viruses or other poultry pathogens between flocks.

- Depending on availability of human resources in a particular locality and scale of operation, farmers could also receive adequate tailor-made training in administration of vaccine, supplied with vaccine and participate in vaccination programs under properly controlled conditions allowing appropriate record keeping.

7. Practical consideration of vaccination

- Vaccination cannot be used as a panacea or in isolation from other measures that must be applied in the face of ongoing outbreaks (e.g. stamping out, biosecurity, disinfection).
- Flocks of birds that are infected must not be vaccinated.
- Sufficient quantities of appropriate vaccines must be available for the planned duration of the vaccination program.
- Logistic arrangements must be in place for delivery and administration of vaccine.
- An exit strategy (after which vaccine would no longer be used) should be identified.
- OIE recommendations should be followed, including in relation to the implementation of a DIVA strategy.

8. Exit strategy

The effectiveness of the vaccination strategy should be reviewed within an appropriate timeframe. It is suggested that initially 12 months of vaccination should be completed before this assessment is done to allow for the influence of seasonal factors. In the context of the 3 years national preparedness and response plan, based up on the recommendation of the National AHI Technical Committee and the approval of the national Coordination Committee, poultry vaccination may come to an end on the following situations:

- based on the analysis of the national, regional and international HPAI situation and if the risk of introduction of the disease is remote
- if effectiveness of vaccination is proved to be low and other interventions are preferred
- etc...

9. Minimum requirements for mobilisation of resources to a suspected ai outbreak scene

Vaccination of 25,000 chickens in 5km radius around an outbreak scene requires 20 vaccinators, each vaccinator inoculating 250 chickens per day. With in 5 days all the 25,000 chickens will be vaccinated. Materials required for these activities are:

- Protective gears for 20 individuals
- 20 automatic syringe
- Disinfectants
- First aid kits

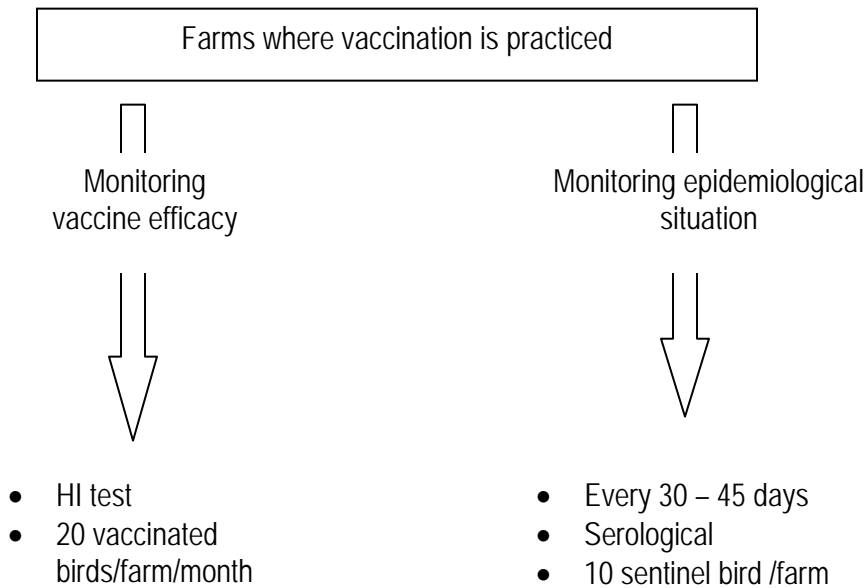
The vaccinators divided into ten teams (2 vaccinators/team) will vaccinate chicken starting from the edge of 3km and moving towards the 5km demarcation. In order to fulfil the minimum requirements get prepared for HPAI outbreaks each region has to train at least 2-3 teams. These teams will cover the required vaccination activities with in their respective regions wherever the outbreaks happen.

Trained vaccinators both from the farms as well as from the woreda animal health clinics will conduct vaccination of chickens in commercial farms and multiplication centres. Since all chickens are concentrated in one centre vaccination of chickens in modern farms is rather easy compared to the vaccination programme in the backyard system.

10. Monitoring measures in areas where vaccination is implemented

Where vaccination is applied, it is important to monitor the effectiveness of vaccination. A less than complete vaccination cover may occur due to poor vaccine quality, inadequate temperature control during storage and

transport or poor delivery of vaccine to the birds, due to inappropriate inoculation technique or low presentation of birds for vaccination. The response to vaccination should be monitored by serological (haemagglutination inhibition) testing. Ideally, testing should compare vaccinated and non-vaccinated birds. This is really only appropriate in intensive poultry production situations where birds are produced on an all-in all-out basis. A small proportion of birds (2-3%) are left as unvaccinated sentinel population. If vaccine is used with a different neuraminidase antigen (eg H5N2 vaccine used against H5N1 field virus), serology can be used to differentiate the response to vaccination, compared with infection. However, in reality this is a difficult process to apply, especially with backyard poultry, which might be, exposed to a variety of low-pathogenic influenza viruses of with different N-antigens.



Annex 1. AI Vaccines

There are a number of different avian influenza vaccines available. Conventional vaccine is prepared from the allantoic fluid of infected eggs, which is inactivated and emulsified with an adjuvant. Attenuated live influenza virus vaccines are not recommended, because of the risk that the vaccine virus could either mutate or reassort with other influenza viruses to become virulent. However, recombinant vaccines have been produced, including fowl-pox virus with the influenza haemagglutinin gene inserted.

VACCINE type	Advantages	Disadvantages
<p>INACTIVATED HOMOLOGOUS VACCINE The same H and N antigens as the strain isolated in the outbreak</p>	<ul style="list-style-type: none"> ○ Readily available ○ Rapid onset of immunity with adjuvants ○ Inexpensive ○ Safe 	<ul style="list-style-type: none"> ○ Impossibility of differentiating vaccinated from infected birds serologically ○ Monitoring by using sentinel unvaccinated birds (identification, bleeding and swabbing) is time consuming, requires planning and monitoring ○ Requires boosters in long-lived species ○ Requires percutaneous injection
<p>INACTIVATED HETEROLOGOUS VACCINE (DIVA Strategy: Differentiation of Infected from Vaccinated Animals) The same HA subtype and a different NA subtype compared to the virus isolated in the outbreak</p>	<p>NA: marker of field infection. Serology can determine whether birds in a vaccinated flock have also been infected.</p>	<ul style="list-style-type: none"> ○ Laboratory capacity to perform the discriminatory test based on the N antigen ○ Serology is expensive, requires additional reagents and requires a complete knowledge of circulating N antigen sub-types ○ Requires boosters in long-lived species ○ Requires percutaneous injection
<p>RECOMBINANT FOWLPOX VIRUS</p>	<ul style="list-style-type: none"> ○ Enables the differentiation between infected and vaccinated birds by serologic tests ○ Specificity of the immune response directed exclusively against HA components ○ Vaccination is rapid and only one dose is required. ○ Inexpensive 	<ul style="list-style-type: none"> ○ Can only be used to vaccinate chickens without previous fowlpox exposure. ○ Therefore, usually applied only to day old chicks ○ Cannot be used in ducks/geese ○ Requires percutaneous injection

Annex 2. Tender Document for Inactivated Avian Influenza Vaccines (Source: FAO position paper, 2004) – A sample

To be used for the purchase of inactivated avian influenza vaccine, by governments or donor organisations, for control of disease in infected countries.

Introduction

These are specifications for the purchase of inactivated avian influenza vaccine, for use in poultry, including chickens and ducks. Vaccination is used to provide protection in the face of possible exposure or to reduce the viral load in an infected environment. Vaccinated birds are generally not fully protected from infection but have increased resistance to infection, suffer less clinical disease and shed substantially less virus. There are several options for vaccine. Conventional vaccine, for which this specification is written, is prepared from the allantoic fluid of infected eggs, which is inactivated and emulsified with adjuvant. Attenuated live influenza virus vaccines are not recommended, because of the risk that the vaccine virus could either mutate or re-assort with other influenza viruses to become pathogenic. However, recombinant vaccines have been produced, including fowl-pox virus with the influenza haemagglutinin gene inserted and haemagglutinin produced in a baculovirus expression system. This specification does not cover the requirements for recombinant vaccines. The virus type used for vaccine production must be of the same haemagglutinin type as the outbreak virus. For maximum potency, it is preferable for the vaccine virus to be closely related to the outbreak strain. If post-vaccination monitoring depends on serology to determine whether antibody-positive birds have been infected or vaccinated (the DIVA test), the neuraminidase type should be different to that of the outbreak strain.

Tender Specification

General requirements

1. Vaccine manufacture must be undertaken in accordance with OIE Guidelines – Chapters 1.1.7 and 2.7.12 of the *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*, 5th edition 2004. It must be produced under Good Manufacturing Practice and under acceptable third-party audited quality assurance.
2. In assessing the acceptability of a vaccine, [FAO or other purchaser] may require documentation to be furnished to validate GMP and quality assurance practices and the production details for a specific vaccine batch. [The purchaser] may also seek to undertake an audit of the manufacturing plant(s).
3. The vaccine must be registered or otherwise acceptable for use, by the Government of [insert country].

Specific requirements

1. The requirement is for [insert number] of doses of vaccine for use in [insert species].
2. The vaccine must contain haemagglutinin antigen of H [insert type – for current SE Asia epidemic, H5] type. Evidence (challenge or VN test) should be provided that the vaccine protects against the virus strains currently circulating in [insert country/region].
3. Evidence should be provided that vaccine produced by the same means (ie not an individual batch requirement) in the same manufacturing plant significantly reduces virus transmission from vaccinated birds when subsequently infected.
4. The vaccine virus must be derived from an LPAI virus strain.
5. The virus should be grown in specific antibody negative or specific pathogen free eggs.
6. The virus is to be inactivated with formalin or beta-propiolactone.

7. The vaccine should be emulsified with a mineral oil adjuvant or with an alternative adjuvant with similar immuno-stimulating efficacy.
8. The vaccine must have undergone appropriate sterility, safety and potency tests in accordance with international standards.
9. The vaccine must have a minimum of one microgram per dose of haemagglutinin protein. Vaccine of a higher haemagglutinin concentration will be considered favourably. Alternatively, the potency of the batch may be demonstrated by live bird challenge with virulent virus or by a minimum HI antibody response of 1:32 in vaccinated birds.
10. Packaging of the vaccine should be in containers of *[insert number of doses]*.
11. Labeling in *[insert language/s]* must indicate manufacturer, type of vaccine, batch identification, volume of contents, storage recommendations and expiry date. Package insert in *[insert language/s]*, to include instructions for vaccinating poultry, recommended species to which the vaccine applies, vaccination regime and dose.
12. Vaccine to have a minimum of six months period prior to expiry, on delivery.
13. Vaccine must be delivered to cold storage in *[insert place or country]*. Verification will be required of continuity of appropriate storage of the vaccine from production to delivery.

Annex 3. Inactivated Avian Influenza Vaccine Suppliers

The companies below provide inactivated avian influenza vaccine (and some of them also recombinant vaccines). NB - By providing their contact details, FAO is not endorsing their product nor recommending them above other possible suppliers.

Harbin Veterinary Research Institute, China

H5N2 - seed virus is A/Turkey/England/N-28/73 - Inactivated monovalent

H5N1 – recombinant virus from A/Goose/Guangdong/1996 and human influenza vaccine virus

H5N1 – Live recombinant avian pox virus vectored H5

Intervet – vaccines for chickens and ducks

<http://www.intervet.com>

Nobilis Influenza H5 – for poultry, used in Vietnam - strain A/Chicken/Mexico/232/94/CPA

Nobilis Influenza H5N2 – strain A/duck/Potsdam/1402/86

Nobilis Influenza H5N6 – strain A/duck/Potsdam/2243/84

Nobilis Influenza H7N1 – strain A/CK/Italy/473/99

Nobilis Influenza H7N7 – strain A/duck/Potsdam/15/80

Merial – vaccine for chickens and ducks

<http://www.merial.com>

Gallimune Flu H5N9 – for chickens, seed virus is A/turkey/Wisconsin/68 (H5N9)

BioFlu H7N1 and H5N9 – for chickens, seed viruses are A/chicken/Italy/1067/99 (H7N1) and

A/chicken/Italy/22A/98 (H5N9)

Lohmann

Avian Influenza H1N1 – for turkey breeder hens

Avian Influenza H2N

Avian Influenza H3N

Avian Influenza H4N

Avian Influenza H5N

POLICY FOR MAINTENANCE OF BIO-SECURITY IN POULTRY PRODUCTIONS SYSTEMS

2. Introduction

Bio-security comprises two elements: bio-containment and bio-exclusion. Bio-containment deals with the prevention of spread of virus from infected premises. Bio-exclusion refers to measures to exclude infectious agents from uninfected premises. Good bio-security depends on the formation of a barrier between farms and the outside environment. This sounds simple but can be difficult to implement successfully in practice. Many items and people routinely enter poultry farms, including replacement birds, feed, water, farm workers, veterinarians, poultry buyers and catchers, and vaccination crews. It is difficult to entirely exclude free ranging animals (e.g. vermin, pet animals, wild birds) from farms but steps should be taken to prevent their entry into poultry sheds.

The exclusion of wild birds from farms merits particular mention because of the potential for wild birds (especially waterfowl) to harbor AI viruses. Wild birds may come into contact with farmed poultry directly (especially if the farmed birds are free-ranging) or indirectly (via contamination of feed and water). The latter pathway is especially important for the Ethiopian backyard type production where chicken share the environment for feeding and watering.

The main goal of a bio-security program is to manage the risk posed by people and items that cross the barriers erected to protect the farm. This is achieved through careful planning and design of farms, use of movement restrictions, appropriate disinfection and use of protective clothing. All commercial poultry farms should develop and implement a formal bio-security plan as appropriate to the farm. It is helpful to document the bio-security plan and specify those responsible for its maintenance.

The usefulness of bio-security plans depends on compliance by farmers and farm workers, who must have a basic understanding of the purpose of the measures. Breaches of bio-security can occur no matter how stringently the measures are implemented. The risk of bio-security breaches is higher the more people and items routinely enter the farm. The effectiveness of bio-security in precluding virus entry also depends on the quantity of virus circulating in the vicinity.

By definition, production sectors 3 and 4 are not bio-secure. The sector 4 refers to Ethiopia's backyard production system representing 98% of the national flock. Although attempts should be made to improve bio-security in these sectors, it is not feasible to prevent the entry of AI where there is a continuing source of infection. Thus, bio-security policy in the Ethiopian context addresses commercial farms and poultry multiplication and dissemination centers. Some feasible bio-security measures can also be recommended for the backyard production system. The policy assists to put in place bio-security standards, guidelines and a national system for monitoring and evaluation.

2. Objective

The main objective of this policy is to provide a platform and guideline for the enforcement and implementation of bio-security system for prevention and control of avian influenza in the intensive and extensive poultry production systems

3. Major activities

The Federal Animal Health Department of MoARD will undertake the following core activities as part of reinforcing and implementing the bio-security policy in point.

3.1. A bio-security policy

The bio-security policy in point is principally targeted the semi-intensive and intensive poultry production systems, including commercial poultry farms, multiplication centers and other smallholder farms. This policy, in as much as possible, is also recommended to be used in the backyard extensive system during outbreaks in the nearby areas.

For the proper adaptation of bio-security measures in large scale farms and centers, MoARD establishes a Poultry Bio-security Task Force (PBTF) which is responsible for:

- Introduction of a feasible bio-security management system in commercial farms, multiplication centers
- Regular monitoring/evaluation and certification of farms and multiplication centers

3.1.1. Bio-security requirement in farms

Cognizing the fact that farms rearing a large number of poultry are at high risk in terms of avian influenza introduction, implementation of a bio-security measures is crucial and of a paramount importance. The bio-security requirements the farms must follow are the following.

- Imported day old chicken or fertile eggs must originate from disease free country or producer, must be quarantined for 7 days in a separate shed and should undergo laboratory investigation for freedom from avian influenza infection.
- Construct the poultry houses tight for wild bird tight
- .Personnel working in farms must wear waterproof footwear, easy to clean and disinfect before entering and after leaving the poultry premises or when moving between different areas in the farm
- Enforce boot dipping using chemical solutions using such foot bath at main gate and at entrance of poultry houses
- Enforce appropriate use of sanitary rooms as well as washing facilities
- Emphasize the importance of taking a shower before entering and leaving the premises or after visiting places / premises where live birds are kept
- Poultry attendants must wear clean working clothes wash properly their hands before resuming work
- The farm management must allocate a separate room for storage of private clothes must dispose facilities for washing clothes
- The farm must enforce movement restriction measures for workers from house to house in the same farm, farm to farm or to areas frequented by wild birds to poultry farms
- Restrict visitors entering the premises; but when necessary they must wear the necessary footwear and clothing
- Vehicles entering / leaving the farm must be thoroughly cleaned and disinfected after use in a place provided for this purpose
- Large scale intensive farms must dispose tyre bath to disinfect car tyres entering the farm compound.

3.2 Bio-containment policy

The National AHI Technical Committee recommended that bio-containment measures should be undertaken during outbreaks in order to prevent spread of the virus into the environment.

3.2.1. During suspected AI outbreak in intensive production settings

The following measures should be taken under supervision of responsible farm personnel and veterinary authorities

- Disinfect boots and vehicles prior to leaving poultry facilities

- Disinfection and cleaning of infected premises with appropriate viricidal disinfectant (detergents, hypochlorites, alkalis, glutaraldehyde and Virkon).
- Set a strict procedure and control mechanism so that infected poultry and poultry products do not leave the farm until further notice when the absence of HPAI is reconfirmed.
- Conduct rapid and timely destruction of all infected and at-risk poultry in 24-48 hours after HPAI initial confirmation and subsequent presumptive diagnosis as a matter of compulsory procedure
- Appropriate disposal of carcasses, eggs, feed stuff and other contaminated materials by burying (see details in disinfection policy)
- Faeces and litter are rapidly disposed by burying or composting, as appropriate.
- In all suspected or confirmed HPAI outbreak events, the veterinary authorities should undertake investigation in all premises in order to establish the source of infection through rigorous observations of the farm, its surrounding, interviewing workers / communities and assessment of other potential risk factors, etc.

3.2.2 During suspected HPAI outbreak in the extensive back yard production settings

AI outbreak containment steps necessarily include the following measures that must be implemented by the veterinary authorities, local administration and the communities:

- Rapid, timely and compulsory destruction of all infected and at-risk poultry in 24 hours after AI confirmation is received or decision for culling is made on presumptive diagnosis
- Appropriate disposal of carcasses, eggs and feed by burying
- Veterinary authorities must enforce market control of poultry and poultry products movement from infected area into free area and with in the AI control zones
- Authorities must enforce ban or restriction of poultry and poultry products marketing until such a time that HPAI is reportedly controlled

COMPENSATION POLICY FOR CULLED POULTRY AND DESTRUCTION OF POULTRY PRODUCTS

1. Introduction

One of the issues that could support outbreak containment and prevention of spread of avian influenza following an outbreak event is the incorporation of an incentive mechanism (compensation scheme) into the system so that farmers whose chicken are culled will receive a reasonable amount of money comparable to the price of chicken during outbreak scenarios. In general terms, compensation has been widely assumed to be a safety-net or livelihoods support instrument, but this is not its primary function in an HPAI epizootic. In the Ethiopian context, however, it is rather regarded as a support tool for outbreak management and prevention of disease spread through stamping out of domestic poultry reared in immediate vicinity of outbreak foci. The main objective of compensation is to prevent the spread of HPAI virus from outbreak scenes to other localities. Compensation is also aimed at providing reasonable amount of money comparable to price of chicken during HPAI outbreak situation to the households who lost their poultry through culling. Where there is no compensation or where compensation levels are less than the market value of the animal, the incentive is to sell to markets and thus possibly escalate disease spread. Conversely, over-compensation is regarded as encouraging deliberate cross-infection of flocks. The nature and scale of the incentive, thus requires, careful adjustment to the prevailing market environment during outbreak events, watertight, equitable and easy-to-manage payment systems need to be put in place, and sufficient resources need to be mobilized. Culling of poultry within a defined zone from outbreak scenes and destruction of contaminated materials is a compulsory procedure and not an option, which should be respected by all concerned. The following part presents the HPAI Compensation Policy, which is prepared by MoARD, reviewed by National AHI Technical Committee and endorsed by the AHI National Coordination Committee.

2. Objectives

Compensation is a process that will follow culling of poultry and proper disposal of carcasses, and infected materials. Compensation encourages individual farmers and communities to effectively participate in HPAI outbreak containment and management programs. The objective of this policy, in a nutshell, is to set standards, modus operandi and streamline the management of the implementation process of compensation for culled poultry and destruction of poultry products and other contaminated materials.

3. Major activities

In order to ensure the setting of efficient compensation mechanisms, as per the objectives set hereinabove, the following core activities will be undertaken.

- Developing and distributing implementation modalities, appropriate guidelines and formats, etc.
- Collecting, recording and summarizing poultry data and facilitating information exchange at all affected administrative levels and per production system features (backyard, small scale, large scale commercial and multiplication centers)

4. Implementation arrangements

In order to facilitate the efficient and smooth implementation of the compensation scheme, the following arrangements need to be put in place.

- Establishment of poultry culling and compensation committees (CCC) at different administrative levels (from Federal to woreda levels). The CCC roles, in general are:
 - to oversee the proper implementation of the culling and destruction of poultry, poultry products and other materials (see also Culling Policy), and
 - To observe and report the compensation process is administered in a transparent and accountable manner and according to the policy provisions governing such matters
- Conduct inventory of poultry resource in HPAI infected localities and farms
- Implement the compensation rate approved by the AHI NCC
- Setting of a system of financial administration related to the approved compensation scheme

4.1. Culling and Compensation committees (CCCs)

Culling of chickens during disease outbreak will be supervised and implemented by Poultry Culling and Compensation Committees established at woreda level. Members of this committee are representatives of Woreda Administration, Health Office, Agricultural Office and two community representatives. The reporting arrangements and functions of CCCs at various administrative levels are stated below.

4.1.1. Federal Poultry Culling and Compensation committee

The Federal CCC is accountable to the National AHI Technical Committee and will have the following responsibilities:

- Coordinate the overall activities of the Federal culling and compensation program
- Collect, record and analyze data received from woreda and report the same to the National AHI Technical Committee
- Summarize financial requirements for compensation from region, woreda and farm levels and present the same to the National AHI Coordinating Committee.

4.1.2. Regional Poultry Culling and Compensation committee

The regional CCC is accountable to the Regional AHI Coordinating Committee and will perform the following tasks:

- Coordinate the overall activities of the Regional culling and compensation program
- Collect, record and analyze data on culling and compensation received from woreda and present the same to the Regional AHI Coordinating Committee
- Summarize the financial data required for compensation and send it to Federal CCC
- Manage the disbursement of financial resource to Woredas where HPAI outbreaks occur, and using the approved voucher system (see Voucher template on page 6)
- Submit regular reports to the Regional AHI Coordinating Committee and Federal CCC

4.1.3. Woreda Poultry Culling and Compensation Committee

The woreda CCC is accountable to the Woreda AHI Coordinating Committee and will perform the following tasks:

- Coordinate the overall activities of the Woreda culling and compensation program in the woreda
- Distribute formats required for data collection to all PAs/Kebeles
- Collect, record, and analyze data received from PAs/Kebeles and present of the same to the Woreda AHI Coordinating Committee
- Conduct the resource inventory, record dead and destroyed poultry and poultry products of semi - intensive and commercial farms and made cost estimates of dead or killed birds for those farms
- Summarize the financial data required for compensation and submit it to Regional and Federal CCCs
- Manage the disbursement of financial resources to PA s/Kebele where HPAI outbreaks occur, and using the approved voucher system
- Supervise the overall Woreda level poultry culling and compensation as well as other related activities
- Provide regular report to Regional and Federal CCCs and woreda AHI Coordination Committee

4.2. Resource Inventory

The resource inventory where HPAI outbreaks occur is necessary in order to determine the nature and scope of control interventions to be implemented in the affected areas. This is also relevant in terms of deciding the timing and proportion of restocking and eventually of the rehabilitation process to be undertaken in the AI affected localities. The nature and type of inventory varies according to the production systems (backyard-Extensive and commercial-semi-intensive or intensive) during avian influenza outbreaks.

5. Compensation Rates

The approved compensation rates were determined based on price value of chicken during outbreaks of HPAI in a given locality. Considering the difficulties of the compensation management processes at grassroots levels, attempts were made to reduce some of the complexities. Simplistic procedures that foster accountability, transparency and equity were adopted.

The computation of compensation rates is based on analysis of poultry market scenarios during AI outbreak events:

- The market value of a chicken in circumstances where there is no AI outbreak is estimated at 40 Birr.
- In cases when avian influenza outbreaks occur, a 50% fall in the market price is anticipated reducing it to 20 Birr.
- Computation of the compensation level is based on 80% of the reduced value, which is equivalent to 16 Birr, a figure to be further stratified accounting to the differences in poultry production system. Accordingly, the compensation rate approved by the National AHI Coordination Committee is presented as follows:
- For backyard chickens, irrespective of the variation in age, a lump sum of 1.5US\$/culled bird in equivalent Ethiopian birr.
- For semi-intensive and intensive commercial farms, and multiplication centers, irrespective of the variation in age, genetic and production value, a lump sum of 2.0US\$/culled bird in equivalent Ethiopian birr. The indicated amount (2US\$) also covers the compensation (apart from culled birds) for the destruction of contaminated feedstuffs and poultry products.

For the sake of greater clarity, It is worth while repeatedly indicating that compensation will only be made for culled poultry and not for any poultry that has died due to any other cause including AI.

6. Financial Administration

Two modalities of implementing compensations are arranged in order to suit the various production systems. These are:

6.1. For compensation in backyard poultry system

- Financial resources for compensation for this sector will be handled and administered by Agricultural and Rural Development Bureaus. In events of outbreaks and when compensation is needed, the amount required will be channeled to woreda agriculture offices.
- The modality of payment will be through voucher system (see attached sample) will be put in place. Owners of culled chicken receive a voucher/bird on the date of culling and sign a document. In less than 5 days, the owners can collect equivalent amount of the allotted money from the respective Woreda Agricultural Office after signing another document prepared for this purpose.

6.2. For compensation in semi-intensive and intensive farms

- Each center will notify its bank account to MoARD through official letter signed by the head of the center.
- The required amount of compensation money will be sent to the farms through their bank accounts from Federal MoARD

Annex 1, Form for Backyard Poultry Stamping Out Record

SHEET NO.

COPY NO.

Region	Woreda	Peasant Association or Kebele
--------	--------	-------------------------------

Date of Stamping Out:

Date of Compensation Payment:

No	Name of Poultry Owner	Address	Number of Poultry Stamped	Amount of Compensation Payment Received	Voucher number	Signature of Owner or Representative	Remark
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							

Stamping out Verified by the Woreda Poultry Culling and Compensation Committee:

Woreda Administration Representative

Name:

Signature:

Woreda Health Representative

Name:

Signature:

Woreda Agriculture Representative

Name:

Signature:

Community Representative

Name:

Signature:

Community Representative

Name:

Signature:

Annex 2. Form for semi-intensive and intensive poultry stamping out record

Sheet No.

Copy No.

Region	Woreda	Farm
--------	--------	------

Date of Stamping Out:

No.	Type of products	Number of Poultry stamped	Amount of Compensation Payment Received	Signature of Owner or Representative	Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Stamping out Verified by Federal Culling and Compensation Committee

Federal Administration Representative

Name:

Signature:

Federal Health Representative

Name:

Signature:

Federal Agriculture Representative

Name:

Signature:

Enterprise Representative

Name:

Signature:

Annex 3, Voucher Template

MINISTRY OF AGRICULTURE & RURAL DEVELOPMENT

Region _____ No. 0000
Wereda _____ Date _____
Kebele/PA _____

Pay to the Order of _____ Birr _____

Voucher

COMPENSATION FEE FOR CULLED CHICKEN DURING AI OUTBREAKS

Farmer's Signature

Signature
(Compensation Committee Chairman)

POLICY FOR POULTRY STAMPING OUT /CULLING/

1. Introduction

Destruction of infected and at-risk poultry (stamping out) has long been the accepted method of control for HPAI in the face of a disease outbreak. Success rates for this method are high when it is implemented rapidly, prior to secondary spread and combined with rigorous movement controls, proper decontamination of infected farms and careful monitoring and surveillance to establish the extent of infection. Under a stamping out policy, poultry on infected premises are destroyed. Some countries consider that all poultry in a zone of specified radius (which may vary from 1 to more than 10km) around infected premises should be destroyed. Others direct attention to “dangerous contact premises” and only destroy birds on these farms when there is evidence that the disease has spread. Such farms are closely monitored for evidence of infection.

FAO recommends that policy on the culling of “at risk” poultry as part of a stamping out policy be risk based, taking into account the likelihood that the birds are infected. It can be difficult to accurately establish the extent of infection. If in doubt, a conservative decision should be made. Attention must be paid to local spread in densely populated poultry areas and to direct and indirect contacts in integrated poultry farms. If there is a high risk of re-infection of farms following restocking (e.g. due to the existence of reservoirs of infection in wildlife), the benefit of culling non-infected poultry is questionable. Equally, there is little reason to cull clinically normal, properly vaccinated poultry in a zone around an infected farm. Infected poultry should be culled as quickly as possible and preferably within 24 hours of detecting infection. Delaying culling of poultry on infected premises results in production of large quantities of virus that increases the likelihood of spread. When diagnosis can be presumptively based on clinical, pathological and/or epidemiological evidence, FAO recommends that culling not be delayed while awaiting laboratory confirmation of infection with HPAI. However, samples should always be taken before or at the time of culling to enable retrospective analysis of the infection status of the flocks destroyed.

In all premises suspected and confirmed as infected with HPAI, Veterinary Authorities should carry out a full investigation to establish the source of infection. This involves detailed observation on the farm and its surroundings as well as interviews with the farm and workers to determine normal farm management practices. One of the critical objectives is to establish the time/date the disease was first detected and to trace the movements of people, poultry, feed and equipment onto and from the farm before and after the first signs of disease. This should cover movements in the period 14-21 days before the outbreak and all movements off the farm after the disease was first detected. Premises with poultry that may have been exposed to the virus via direct or indirect contact with confirmed infected premises should be investigated for signs of disease and, if warranted, put in quarantine. Veterinary Authorities should take steps to obtain the necessary legal authority to destroy infected poultry and, if required, those on surrounding farms. They should be able to obtain, at short notice, the services of teams of workers trained in the humane destruction of poultry. These workers must have proper training and knowledge of health and safety risks associated with HPAI and must be appropriately prepared. In the event of a widespread outbreak of HPAI, to which a rapid

response is required, trained personnel are likely to be in short supply and priorities need to be determined for the response action to be undertaken.

2. Objective

The main objective of poultry culling is to control the spread of HPAI outbreak through infected birds, using fast stamping out intervention and minimize the contact between infected and clean poultry flocks. It is, however, important to note that proper implementation of HPAI other control measures is also required together with stamping.

3. Major activities

Strengthen the capacity to enforce preventive and control measures through:

- Stamping out of poultry in 3km radius from the outbreaks foci and proper disposal of carcasses
- Destruction of poultry products, feed stuff and other contaminated materials within the infected zone
- Disinfect all contaminated premises
- Ensure the proper implementation of other necessary HPAI control measures.

4. Methods used for the destruction of poultry:

Various methods are used for destruction of poultry on farms. The method used should be humane and should not cause spread of disease. Importantly, it should not endanger workers. The methods to be used should be incorporated into contingency plans. It may be difficult to prevent completely the spread of infection during destruction of poultry (and subsequent disposal of waste materials). Increased human movement and required cleaning, disinfection and disposal activities inevitably result in the release of dust and dander, which can potentially spread AI viruses to nearby farms. Appropriate risk reduction strategies include rigorous cleaning and disinfection of clothes, equipment and transport vehicles, and good personal hygiene on the part of workers, veterinarians and government officials. Litter and feed supplies, if contaminated, may be sprayed with water to minimize the generation of dust. If possible, disposal of waste materials on farm is preferred.

Physical methods such as cervical dislocation using cattle castration forceps are preferable for the humane destruction of backyard chickens. Sites where destruction is taking place must be secure to prevent unauthorised entry or exit of people and vehicles. A single entrance/exit is recommended and techniques should be employed to ensure all vehicles, items and personnel moving off the premises have been decontaminated. Veterinary authorities should have the legal authority to control movements on and off infected premises and premises that are subject of quarantine or other disease control measures.

Methods used to kill the birds should provoke immediate death or immediate loss of consciousness until death. Induction of unconsciousness should be non-aversive and cause no anxiety, pain, distress or suffering in the animals. Continuous monitoring is

needed to ensure that killing methods used are effective. Decapitation or cervical dislocation is a practically achievable method of culling for both in the backyard and improved poultry production systems in Ethiopia. This must be done without causing unnecessary distress to the animals. Use a sharpened knife or a cattle castration forceps, if available, could also be used for this purpose. However, ensure that blood and feathers are not dispersed in the environment, as it is a source of infection for both people and animals

Accurate records on poultry (age and type of birds killed and, as appropriate, records of valuation), methods of culling, and other relevant information should be kept and stored in a dedicated database system for eventual analysis. These requirements apply to all farms and production systems on which poultry are being destroyed.

5. Implementation arrangements

Regional staff as a specialised team, supported by Woreda veterinary or para-veterinary personnel should undertake AI outbreak investigations. Screening tests at a regional veterinary laboratory will be carried out to support initial clinical and post-mortem findings. Confirmatory diagnosis of HPAI will be made at the National Reference Laboratory at Sebeta.

The Regional Bureau of Agriculture together with the Regional Focal Person for the Emergency Operations Centre, after consultation with the Head of the Federal Animal Health Department (MoARD), will make the decision to:

- Declare, on the basis of preliminary examinations, that the outbreak is due to HPAI and require the infected birds to be culled and movement control be imposed; or
- Require confirmatory testing to be undertaken at NAHRC (Sebeta), with the infected place remaining in quarantine and movement control being imposed at least until a result is obtained, or
- Declare that the outbreak is not HPAI and release (or not impose) the infected place from quarantine

The farm or village in which infected birds are identified is the infected place and is secured as a quarantine area until all culling and decontamination is completed. Birds regarded as dangerous contacts (i.e. they might be infected) are included in the quarantine area, to be culled. The surrounding area is the control area, which is subject to movement control and to ring vaccination.

Teams of trained people are brought in to cull birds, dispose of carcasses, waste and manure by burial, composting or burning, in that order of preference. Other teams undertake decontamination. After a period of time, depending on the ability to undertake good disinfection (30–40 days), new chicken are allowed to be re-introduced. Culling of chicken during disease outbreak will be supervised and implemented by Poultry Culling and Compensation Committees(CCC) established at Kebele/Woreda level. Members of this committee are representatives of Woreda Administration, Health Office, Agricultural Office and two community representatives. For culling of poultry in the backyard production system, the CCC with local Kebele authorise organizes the entire culling process and in mobilizing the community to actively participate in facilitation the culling process and implementing the subsequent bio-security, movement control and market restriction measures.

6. Minimum manpower and material requirements

When an outbreak of AI is confirmed a minimum of 5,000 chickens will be culled and disposed with in a day in the 3km radius around an outbreak scene. For this purpose the minimum number of personnel required is estimated at 10 Animal Health Assistant or Animal Health Technician or Development Agents. These will then be divided in two teams (5 person/team) and implement the culling activity in collaboration with CCC. The minimum material requirements for the purpose of poultry culling include: protective gears for 10 individuals, 500 plastic bags, adequate volumes of disinfectants and first aid kits

7. Specific guidelines

FAO recommends that countries take steps to ensure that workers contacting potentially infected poultry wear appropriate personal protective equipment (PPE) in accordance with WHO recommendations, and receive training in the correct fitting of this equipment. Under hot, humid conditions, practical problems may be encountered in fulfilling these requirements.

FAO recommends compliance with WHO advice on the vaccination of workers on infected farms with current human influenza virus vaccines before anticipated exposure to AI viruses in any response to HPAI, to minimize the potential risk of acquiring concurrent infection with avian and human influenza viruses. Two weeks are required to develop protective immunity. In practice, it is rarely possible to access a large number of immune workers at the beginning of the emergency. Antiviral therapy is available and could be supplied to people working on known infected premises. Veterinary Authorities should conform with recommendations of WHO and relevant national health organizations with respect to public health considerations in responding to HPAI. The following guideline points are worth noting:

- Workers contacting potentially infected poultry should wear appropriate personal protective equipment (PPE)
- All chicken populations in infected farms and in at risk should be destroyed using a method described below
- This should be done within a radius of 1-3 km (according to potential spread of virus) around infected premises / places
- Infected and at-risk poultry should be killed within 24 h of detection of disease to minimise spread of virus
- If virus has spread beyond identified area for destruction the Veterinary Authorities may consider different approach towards destruction of poultry; in this case this may be done only in infected farms – farms located in the proximity need then to be closely monitored, however,
- If there is high risk of re-infection following stamping out, there is no reason to destroy clinically normal or non-infected chicken or vaccinated chicken
- When diagnosis can be presumptively based on clinical, pathological and/or epidemiological evidence it is recommended that destruction should not be delayed while awaiting laboratory confirmation of infection with HPAI, even though samples

should always be taken before or at the time of destruction to enable retrospective analysis of the infection status of the flocks destroyed

- In all premises suspected and confirmed as infected with HPAI, Veterinary authorities should carry out a full investigation to establish the source of infection and potential spread (back and forward tracing) - this should cover movements in the period 14-21 days before the outbreak
- Veterinary Authorities should always supervise this procedure.

MOVEMENT CONTROL AND MARKET RESTRICTION/BAN

1. Introduction

Generally, based on the bio-security levels and risk to HPAI, poultry production systems are broadly classified into four distinct sectors. These are:

Sector 1: Industrial integrated system with high level bio-security and birds/products marketed commercially (e.g. farms that are part of an integrated broiler production enterprise with clearly defined and implemented standard operating procedures for bio-security).

Sector 2: Commercial poultry production system with moderate to high biosecurity and birds/products usually marketed commercially (e.g. farms with birds kept indoors continuously; strictly preventing contact with other poultry or wildlife).

Sector 3: Commercial poultry production system with low to minimal biosecurity and birds/products usually entering live bird markets (e.g. a caged layer farm with birds in open sheds; a farm with poultry spending time outside the shed; a farm producing chickens and waterfowl).

Sector 4: Village or backyard production with minimal bio-security and birds/products consumed locally.

Infection is less likely to occur in sector 1 farm, providing that bio-security is maintained, but the consequences of such infection may be great, due to the large number and high density of naive poultry in the farm. Conversely, production systems in the other three sectors (2,3,4) represent a continuum of pathways and risks for the entry of HPAI. Commercial farming practices that present greater likelihood of the entry of infection include system where poultry forage outdoors and are kept in sheds at night. Village production effectively has no bio-security and the likelihood that infection will actually occur depends on the challenge (prevalence of HPAI in surrounding farms and wild birds) and the existence of risk mitigating factors, such as vaccination. Vaccination programs could target backyard/village chickens to minimize disease propagation by this sector.

Many farmers keep multiple batches of poultry of different ages to spread their income and to avoid the financial risks associated with having all birds entering the market on the same date. However, partial sale of birds from commercial farms presents a greater bio-security risk than the sale of the entire batch of birds (all-in, all-out production). This is primarily because birds remaining in the farm have been exposed to catchers or other workers, who customarily move from farm to farm and can readily spread infection if HPAI is in the area. Multi-age poultry farms present a higher risk than single age farms, mainly because they are not managed on an 'all-in, all-out' basis.

Live bird markets present a risk of recirculation of poultry pathogens and a potential

avenue of exposure of human beings to live birds. Some practices present particular

health risks, such as the holding of poultry overnight and the return of unsold birds to

farms. Market stocking rates and hygiene also influence the likelihood of spread of avian

influenza. Lower stocking rates and a more stringent approach to hygiene will generally reduce the risk of survival and spread of AI viruses and other pathogens.

The primary means of spread of the disease is by movement of infected birds, materials or means of transport. Therefore, movement control is an essential part of the control of HPAI and must be given due importance in planning and implementation of HPAI prevention and control measures. Prevention of contacts between susceptible animals and disease causing agent is accomplished by quarantine and movement controls, bio-security measures and epidemiological investigations. Restriction of poultry/poultry product market is also applied in an area where the disease is reported. Movement control and market restriction can minimize the spread of the disease through and need to be considered in the control strategy.

2. Objectives

The main objectives are to control the spread of HPAI virus through infected poultry, poultry products, contaminated materials, etc using effective movement control and market restriction within 10 km radius around an outbreak scene and in case of modern farms on the entire premises of infected farm.

3. Major activities

- Effective communication and community awareness programs regarding the ban on poultry movement and restriction of poultry markets for the purpose of public safety and controlling the spread of infection.
- Mobilizing the local law re-enforcing authorities (including the police, kebele administration and other relevant stakeholders)
- Define the zoning (kebeles, or villages up to 10 km radius from the site of the outbreak) in which movement control and market restriction will be imposed
- Regular inspection that the ban is implemented and fully respected
- Develop a system of penalty for non-compliance.
- Decide the minimum duration of the ban and communicating the same to the concerned communities

4. Implementation arrangements

- The Regional Bureau of Agriculture together with the Regional Focal Person for the Emergency Operations Centre, after consultation with the Head of the Federal Animal Health Department (MoARD), will make the decision to declare, on the basis of preliminary examinations, that the outbreak is due to HPAI and require the infected birds to be culled and movement control be imposed; or require confirmatory testing to be undertaken at NAHRC (Sebeta), with the infected place remaining in quarantine and movement control being imposed at least until a result is obtained; or declare that the outbreak is not HPAI and release (or not impose) the infected place from quarantine.
- The farm or village in which infected birds are identified is the infected place and is secured as a quarantine area until all culling and decontamination is completed. Poultry regarded as dangerous contacts (i.e. they might be infected) are included in the quarantine area, to be

culled. The surrounding area is the control area, which is subject to movement control and to ring vaccination.

- Movement control should be implemented under the supervision of local Authorities that will coordinate the actions of the animal health assistants/ animal health technicians, development agents and other pertinent personnel in the agriculture sector. Controls should be placed on roads, supported by police or military personnel, in order to inspect, trains, vehicles and other land transport systems.
- Warning signs are widely posted around the infected zone, disinfection stations are set up in the transportation entrance of infected zones to disinfect vehicles and items entering and exiting zones; movement of all susceptible live birds and their products was controlled.
- All the poultry and their products markets in the infected zones, and the live poultry markets with the 10km around the infected zones must be closed. If poultry and their products are sold out during the incubation and clinical manifestation period or moved out, tracing should be conducted on the suspect contaminated items to prevent these items from spreading disease.
- With regard to public health, surveillance of occupational staff of poultry rearing, trade and transportation and process, especially the staff in the infected zones should be intensified, and epidemiological investigation should be conducted. Staff participating in the destroying infected poultry and cleaning of contaminated premises must implement stringent protective measures.
- The duration of movement control and market restriction shall be in place for a minimum of 60 days. When quarantine is lifted, live bird trade markets in 10km around the infection zone may be reopened.
- Any person who violates the movement control and market restriction imposed by Veterinary Authorities shall be punished as per the Animal Diseases Prevention and Control Proclamation No. 267/2002 Part 3 no 10-15 and Part 5 No. 21 under the provisions of Penal Code (see annex).

5. Measures relevant to restocking after depopulating an infected flock

For restocking after depopulating an infected flock, the measures to be adopted should be modified depending on whether or not HPAI is considered to be endemic in the country/compartments. In countries/compartments in which HPAI is endemic, consideration should be given to vaccinating replacement stock particularly from production sectors 3 and 4.

Restocking may be permitted in accordance with the following measures:

- Cleaning and disinfection carried out according to minimum standard appropriate to the conditions at the farm or village (no faeces no feathers, at least in sheds/cages)
- Where possible enhance bio-security
- The premises have been empty of poultry for minimum of 6 weeks from the completion of cleaning and disinfection
- Premises should not be restocked if there is evidence of infection in flocks within 3 km, unless other measures (e.g. vaccination) have been implemented
- Poultry of known health status should be used to restock
- Specific monitoring and veterinary investigation of mortalities should be implemented.