Annexes

Annex 1: Selected references for further information

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5. FAO EMPRES. Good Emergency Management Practice (GEMP). Available at http://www.fao.org/ag/againfo/programmes/en/empres/GEMP/index.html.
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10. Hinshaw, V.S., Webster, R.G., and Turner, B. 1979. Water-borne transmission of influenza A viruses? *Intervirology* 11(1): 66–68.
11. Middleton, D., Bingham, J., Selleck, P., Lowther, S., *et al*. 2007. Efficacy of inactivated vaccines against H5N1 avian influenza infection in ducks. *Virology* 359: 66–71.
12. OIE. 2008a. Avian influenza. *In: Manual of diagnostic tests and vaccines for terrestrial animals 2008*. Chapter 2.3.4. Available at http://www.oie.int/eng/normes/mmanual/A_summry.htm.
13. OIE. 2008b. Avian influenza. *In: Terrestrial Animal Health Code 2008*. Chapter 10.4. Available at http://www.oie.int/eng/normes/Mcode/en_sommaire.htm.

14. Rose, K., Newman, S., Uhart, M., and Lubroth, J. 2006. *Wild bird highly pathogenic avian influenza surveillance: Sample collection from healthy, sick and dead birds*. FAO Animal Production and Health Manual No. 4. Rome. 56 pp. Available at http://www.fao.org/docrep/010/a0960e/a0960e00.HTM.
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16. Whitworth, D., Newman, S., Mundkur, T., and Harris, P. 2007. *Wild birds and avian influenza: An introduction to applied field research and disease sampling techniques*. FAO Animal Production and Health Manual No. 5. Rome. 123 pp. Available at http://www.fao.org/docrep/010/a1521e/a1521e00.htm.

Additional reading:

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2. World Health Organization. 2009. *A guide for shipping infectious substances*. Geneva. Available at http://www.who.int/ihr/infectious_substances/en/index.html.
3. World Health Organization. 2009. *Instructions for shipments of pandemic (H1N1) specimens and virus isolates to WHO Collaborating Centres for influenza*. Geneva. Available at http://www.who.int/csr/resources/publications/swineflu/instructions-shipments/en/index.html.
4. World Organisation for Animal Health (OIE). 2008. Collection and shipment of diagnostic species. *In: Manual of diagnostic tests and vaccines for terrestrial animals 2008*. Section D, p. 8. Paris. Available at http://www.oie.int/eng/normes/mmanual/2008/pdf/1.1.01_COLLECTION.pdf.
5. International Air Transport Association. *Guidance Document: Infectious Substances*. Geneva. Available at http://www.iata.org/whatwedo/cargo/dangerous_goods/infectious_substances.htm.

Annex 2: Sample of tender document for inactivated avian influenza vaccines

To be used for the purchase of inactivated avian influenza vaccine by governments or donor organizations 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 they have increased resistance to infection, suffer less clinical disease and shed substantially less virus.

There are several AI vaccine types and formulations. 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 reassort with other influenza viruses to become pathogenic. However, recombinant vaccines have been produced, including fowlpox 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 from 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 (GMP) 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 the vaccine produced by the same means (i.e. 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. Labelling 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 and 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: OIE/FAO reference laboratories and experts for avian influenza

Dr Ian Brown
VLA Weybridge
New Haw, Addlestone, Surrey KT15 3NB
UNITED KINGDOM
Tel: +44 1932 341111 Fax: +44 1932 347046
E-mail: i.h.brown@vla.defra.gsi.gov.uk

Dr Ilaria Capua
Istituto Zooprofilattico Sperimentale delle Venezie, Laboratorio Virologia
Via Romea 14/A, 35020 Legnaro, Padova
ITALY
Tel: +39 049 8084369 Fax: +39 049 8084360
E-mail: icapua@izsvenezie.it

Dr Timm Harder
National Reference Laboratory for Highly Pathogenic Avian Influenza
and Newcastle Disease
Institute of Diagnostic Virology
Federal Research Centre for Virus Diseases of Animals (BFAV)
Boddenblick 5a, D-17493 Greifswald - Insel Riems
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Dr John Pasick
Canadian Food Inspection Agency, National Centre for Foreign Animal Disease
1015 Arlington Street, Winnipeg, Manitoba R3E 3M4
CANADA
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E-mail: jpasick@inspection.gc.ca

Dr Paul W. Selleck
CSIRO, Australian Animal Health Laboratory (AAHL)
5 Portarlington Road, Private Bag 24, Geelong 3220, Victoria
AUSTRALIA
Tel: +61 3 5227 5000 Fax: +61 3 5227 5555
E-mail: paul.selleck@csiro.au

Dr David Swayne
Southeast Poultry Research Laboratory
USDA/Agricultural Research Service
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Athens, Georgia 30605
UNITED STATES OF AMERICA
Tel: +1 706 546 3433 Fax: +1 706 546 3161
E-mail: david.swayne@ars.usda.gov

For more information, visit the OFFLU Web site (www.offlu.net).

Annex 4: Information for shipping international diagnostic specimens

OIE/FAO AND NATIONAL REFERENCE LABORATORY FOR AVIAN INFLUENZA AND NEWCASTLE DISEASE
ISTITUTO ZOOPROFILATTICO SPERIMENTALE DELLE VENEZIE (IZSVE)

(as of September 2008)

Types of specimen

Specimens submitted may be viruses isolated in the submitting country or clinical specimens, such as tissues or swabs, collected from diseased birds.

Packaging requirements

All materials should be placed in leakproof containers. Packaging should be composed of: (1) a primary receptacle, (2) a secondary packaging, and (3) a rigid outer packaging. Packaging of diagnostic samples should be labelled "UN3373" and comply with IATA PI650 standards. Packaging of virus isolates should be labelled "UN2814" for highly pathogenic avian influenza (HPAI) and "UN2900" for NDV and low pathogenic avian influenza (LPAI) and comply with IATA PI602 standards. Please contact your shipping agent to confirm the provision of boxes complying with these requirements.

Documents to be accompanied for clearing

Import permits from the Italian Ministry of Health (provided by IZSVe in advance) and a signed pro forma invoice (the template will be provided by IZSVe) should be attached firmly to the box. Shipper's declaration (Dangerous Goods Declaration) is required for shipment in UN2814 or UN2900 categories.

Shipping procedure

Air freight to Venice Marco Polo Airport (recommended for UN3373 packages, but not for UN2814 or UN2900 packages), Milan Malpensa or Rome Fiumicino Airport. Please inform IZSVe at least one week in advance and arrange for shipments to arrive at Italian airports from Mondays to Thursdays only. Please note that a door-to-door delivery is highly recommended, so please ask your agent for this type of service.

Important information

It is essential to:

- contact IZSVe before shipping; and
- provide the name and details (including telephone number) of a contact person from the shipping laboratory.

Notification of shipment

Before shipping, please provide the following information to the IZSVe contact person:

- date of shipment;
- airline name and flight number;
- name of destination airport;
- expected date of arrival in Italy;
- air waybill number (the air waybill should be faxed or e-mailed to the contact person as soon as possible); and
- name and contact details of the person to whom the results should be communicated.

Shipping Address

Istituto Zooprofilattico Sperimentale delle Venezie,
Virology Department
Viale dell'Università 10,
35020 Legnaro (PD)
Italy
Tel: +39 049 8084369
Fax: +39 049 8084360

Contact people at IZSVe

For diagnostic samples and virus isolates:
Marta Vettore
E-mail: mvettore@izsvenezie.it

Giovanni Cattoli
E-mail: gcattoli@izsvenezie.it

Isabella Monne
E-mail: imonne@izsvenezie.it

For reagents:
William Dundon
E-mail: wdundon@izsvenezie.it

Other contact persons:
Paola De Benedictis
E-mail : pdebenedictis@izsvenezie.it

AVIAN VIROLOGY LABORATORY, VETERINARY LABORATORIES AGENCY WEYBRIDGE, UK FROM OUTSIDE THE EU

(as of 15 June 2009)

Availability of diagnostic services

The laboratory offers an international diagnostic service for avian influenza and Newcastle disease. A free service for analysing viruses isolated from animals suspected to be infected with the above-mentioned viruses is available, and testing is carried out on behalf of the national regulatory authority, to whom results will be copied. OIE/FAO will also be informed. General diagnostics and virus isolation of tissue samples may be charged for.

Packaging requirements

Specimens for diagnosis of the pathogens listed above must be packaged according to PI650 requirement for UN3373 Category B classification, unless exempt due to a minimal likelihood that pathogens are present (e.g. samples for serology). Specimens must be packaged according to PI602 requirement for UN2814 or UN2900 classification if the content of the shipment is isolated virus. It is essential that packaging ensures that the content of containers, which may break or leak in transit, cannot contaminate the outside layer of the parcel. Samples should be placed in a watertight primary container, which should be individually wrapped in absorbent material and then placed in a watertight crushproof and leakproof IATA regulation secondary container. The primary container is to be treated lightly with disinfectant. This may be surrounded by sealed freezer packs or dry ice, and it must be enclosed in a strong outer packaging, which should allow the release of carbon dioxide if dry ice is enclosed. Under no circumstances should dry ice be placed in sealed containers, due to the risk of explosion.

Labelling

The outer packaging of the parcel must be clearly labelled with the following information:

Our import licence number:

- For Newcastle disease: AHZ/2232/2002/5
- For avian influenza, other viruses, avian tissue, serum, faeces and eggs: AHZ/2074C/2004/3

Shipping address:

Dr Ruth Manvell
Avian Virology, VLA Weybridge
New Haw, Addlestone,
Surrey KT15 3NB,
United Kingdom

In addition, the label must include the following:

- for parcels sent by air freight, the instructions must state that the package is "CARE OF TRANSGLOBAL, Unit D1 Dolphin Industrial Estate, Windmill Road, Sunbury on Thames, Middlesex TW16 7HE" (this will ensure rapid processing at the airport);
- name and telephone number of the person responsible for sending the parcel;
- infectious substance hazard label, indicating the UN code of the contents;
- package must be marked: [UN code*] – [Proper Shipping Name*] – PACKAGE ONLY TO BE OPENED AT THE AVIAN VIROLOGY SECTION, VETERINARY LABORATORIES AGENCY, WEYBRIDGE, SURREY;
- flight number;
- air waybill number; and
- dry ice label (if necessary).

Before selecting biological material, the sender should check with the VLA-Weybridge Avian Virology Laboratory about the samples required and the conditions for dispatch. A list of contents with as much history about the isolates as possible – including species, age, area/country of isolation, any clinical history, etc. – should be enclosed in a waterproof envelope between the secondary and outer packaging, not inside the container with the samples.

Mode of transport

The Department for Environment, Food and Rural Affairs (DEFRA) licence allows the importation of biological material to VLA-Weybridge by air freight, normally to London Heathrow Airport. The VLA-Weybridge–nominated broker will "clear" customs and deliver the shipment. If it is not possible to deliver samples by air freight, then a courier designated by VLA-Weybridge may be used, if this has been agreed to by the Avian Virology Laboratory in advance of the shipment.

Notification of shipment

Before dispatch, the shipment details must be agreed upon with the VLA-Weybridge Avian Virology Laboratory, which must be given the flight number, the air waybill number, the date and time of expected arrival in the UK (by fax, telephone or e-mail) before the arrival of the materials in order to facilitate an early delivery, and a point of contact for queries and to whom test results will be provided (name, telephone number, fax number, e-mail address).

Contact should be made via:

Fax: +44 (0)1932 357 856
Tel: +44 (0)1932 357 736
E-mail: aiwrl@vla.defra.gsi.gov.uk

If you wish to discuss a submission and options for support from the International Reference Laboratory for Avian Influenza and Newcastle Disease, please contact: Dr. I. H. Brown (tel: +44 (0)1932 357 339; fax: +44 (0)1932 357 239; e-mail: i.h.brown@vla.defra.gsi.gov.uk).

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* See page 40 Table 3 for applicable UN code and proper shipping name.

AUSTRALIAN ANIMAL HEALTH LABORATORY (AAHL)
(as of June 2009)

Type of specimens

Specimens submitted to AAHL for disease diagnosis may be either virus isolates made in the submitting country or clinical specimens, such as tissues or swabs, collected from diseased birds.

Import permit and packing

Copies of Australian import permits are available from AAHL by contacting aahl-ccessions@csiro.au. All specimens must be packed in leakproof containers in accordance with the appropriate IATA regulation and appropriately labelled. Suitable transport containers and packing instructions are also available from AAHL by contacting aahl-accessions@csiro.au. Copies of the import permit and other consignment details should be attached to the outside of the package to expedite clearance through Australian customs.

Notification of shipment

If submitting specimens, please notify the accessions clerk (accessions@csiro.au), the duty veterinarian (dutyvet@csiro.au) or Dr. Peter Daniels (+61 3 5227 5000) of the consignment details so that the specimens can be collected upon arrival in Australia. Alternatively, send the information by fax to +61 3 5227 5555. Consignment details include the consignment note/air waybill number, courier/airline and expected arrival date.

Shipping address

The Director
Australian Animal Health Laboratory
5 Portarlington Road
Geelong VIC 3220
Australia
Tel: +61 3 5227 5000
Fax: +61 3 5227 5555
http://www.csiro.au/aahl

Contact for avian influenza

You may also wish to discuss the testing required with Peter Daniels (peter.daniels@csiro.au) or Paul Selleck (paul.selleck@csiro.au) at +61 3 5227 5000 prior to submitting the specimens.

NATIONAL VETERINARY SERVICES LABORATORIES (NVSL), AMES, IOWA, USA

(as of June 2008)

Import permit

Packages containing diagnostic specimens or organisms (infectious materials) imported from foreign locations into the United States of America must be accompanied by a permit issued by the U.S. Department of Agriculture. The importation permit, with proper packaging and labelling, will expedite clearance of the package through U.S. customs. One copy of the permit should be attached to the outside of the shipping container and a second copy placed just inside the lid of the outer shipping container. The importation permit can be obtained from the laboratory (NVSL, Ames, Iowa).

Packaging requirements

All materials should be in leakproof containers and packaged to withstand breakage. All materials should be properly labelled.

Shipping address

Director
National Veterinary Services Laboratories
Diagnostic Virology Laboratory
1800 Dayton Avenue
Ames, Iowa, USA 50010

Notification of shipment

Please notify the Diagnostic Virology Laboratory with shipping information (date of arrival, airline/courier, waybill number, etc.) as soon as it is available. Fax information to +1 (515) 663-7348 or telephone +1 (515) 663-7551.

Contact for avian influenza

Dr. Beverly J Schmitt
Tel: +1 515/663-7532
Fax: +1 515/663-7348
E-mail: beverly.j.schmitt@usda.gov

FRIEDRICH-LOEFFLER INSTITUTE, FLI, ISLE OF RIEMS, GERMANY
(as of April 2008)

Before shipment of samples

Contact the FLI at timm.harder@fli.bund.de (Timm Harder, head AI lab, tel: ++49 38351 7152) or christian.grund@fli.bund.de (head ND lab, tel: ++49 38351 7106) and announce/discuss shipment of diagnostic materials and diagnostic cultures at least one week ahead of shipment. Designate a contact person in your institute and provide contact details. In case of e-mail communication, please be informed that the FLI firewall will not accept e-mails from Yahoo or similar providers if the e-mail carries an attachment; such e-mails will be automatically returned unread to sender.

What to ship

Virus isolates made in your country and clinical specimens – including tissues, swabs, and sera of avian or mammalian origin with regard to AI/ND-specific diagnostic measures – can be sent.

Packaging requirements

Packaging must comply with OIE and IATA regulations (see http://www.oie.int/eng/normes/mmanual/2008/pdf/1.1.01_COLLECTION.pdf for details). Leakproof containers are to be used throughout. Packages are composed of (1) a primary receptacle, (2) a secondary packaging and (3) a rigid outer packaging. "Diagnostic samples" in IATA PI 650 standard boxes are encoded UN3373 ("Biological Substance Category B"). These comprise all clinical material and uncharacterized virus cultures (diagnostic culture). "Virus isolates" in IATA PI 602 standard boxes are encoded UN2814 ("Infectious substance affecting humans") for culture material containing HPAIV and UN2900 ("Infectious substance affecting animals only") for NDV. Dry ice, if used, is to be placed between the secondary packaging and the rigid (not airtight) outer packaging. Declare dry ice content on outer package as UN 1845. More details in Spanish, French or English can be found at http://www.who.int/csr/resources/publications/biosafety/WHO_HSE_EPR_2008_10/en/index.html.

Contact your local branch of international shipping agents to ensure compliance with packaging requirements. The shipper is responsible and held liable for accidents resulting from violation of these rules.

Direct air freight or couriers to Berlin-Tegel Airport (door-to-door delivery is highly recommended) or to Frankfurt Rhein-Main Airport (courier only); select the appropriate import permission. Arrange for shipments to arrive in Germany from Monday to Thursday only.

Documents

Permissions for import via airports Berlin-Tegel or Frankfurt Rhein-Main are provided by the FLI upon contact and must accompany the shipment in an envelope attached to the outside of the outer packaging. In addition, a signed pro forma invoice (template provided by the FLI upon contact) must be provided. For UN2814 and UN2900 shipments, a shipper's declaration for dangerous goods has to be completed and signed by an authorized person. Check whether export certificates from your national veterinary authorities/ministries are required.

Shipping address:

Friedrich-Loeffler Institute, Institute of Diagnostic Virology
OIE and National Reference Laboratories for AI/ND
Suedufer 10, D-17493 Greifswald-Insel Riems
Germany
Tel: +49 38351 70
Fax: +49 38351 7275

Notification of shipment

While shipping, please provide your contact person at the FLI with:

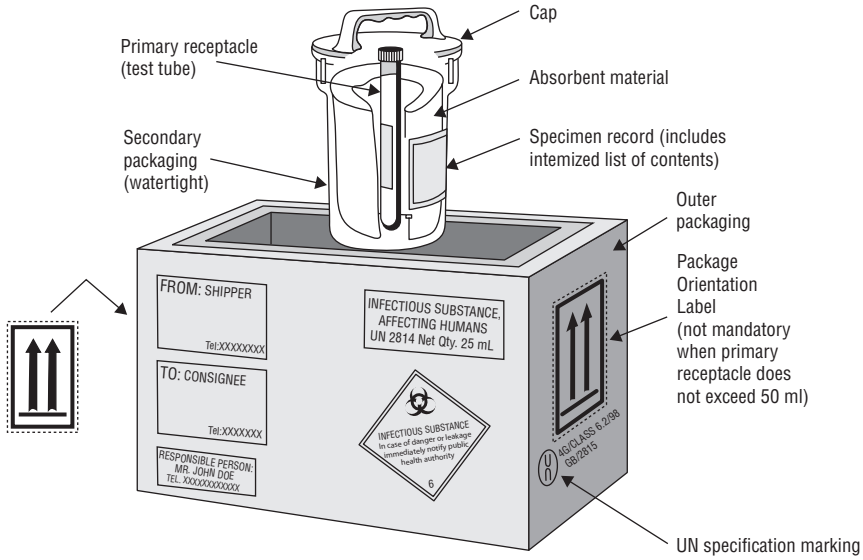
- embarkation date;
- airline and flight number;
- name of the destination airport;
- date of arrival in Germany ;
- airway bill number; and
- contact person to whom the results should be sent (name, phone and fax number, e-mail address).

Additional information

According to rules of the OIE, all results concerning the detection of notifiable diseases will be forwarded to OIE headquarters, Paris.

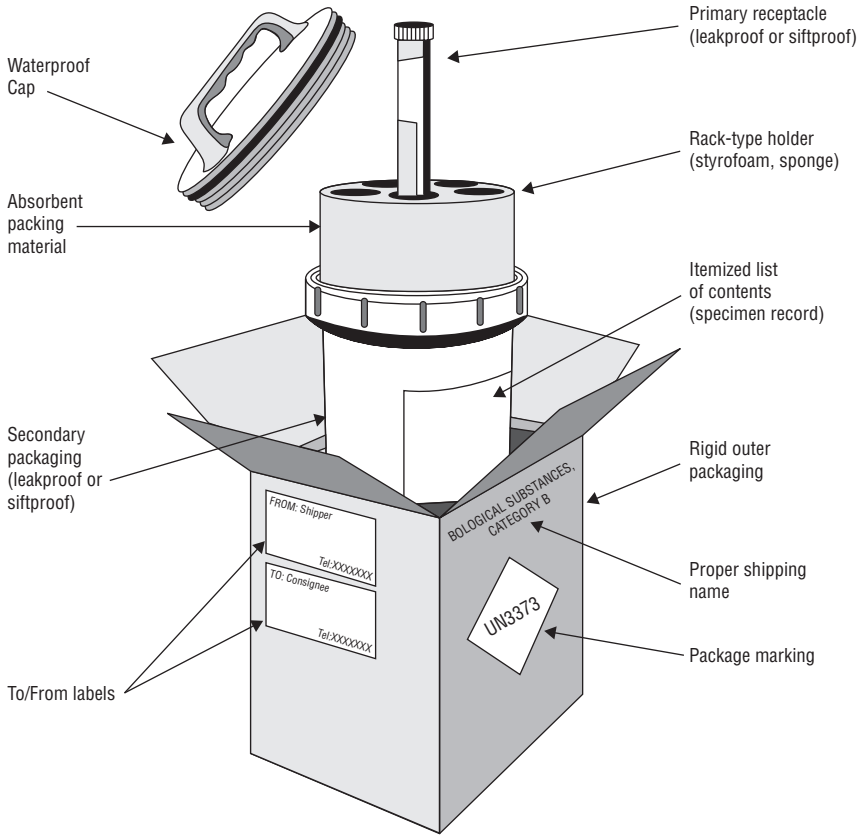
Annex 5: Examples of packing and marking for Category A and B infectious substances

Example of packing and marking for category A infectious substances
(See Packing Instruction 602 for additional requirements)



Notes: The smallest external dimension of the outer packaging must not be less than 100 mm.
The primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure producing pressure differential of not less than 95 kPa.
Source: IATA. Guidance Document: Infectious Substances (http://www.iata.org/NR/rdonlyres/9C7E382B-2536-47CE-84B4-9A883ECFA040/0/Guidance_Doc62DGR_50.pdf).

Example of packing and marking for category B infectious substances
(See Packing Instruction 650 for additional requirements, e.g. drop test)



Notes: At least one surface of the outer packaging must have a minimum dimension of 100 mm x 100 mm.
The primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure producing pressure differential of not less than 95 95 kPa.
Source: IATA. Guidance Document: Infectious Substances (http://www.iata.org/NR/rdonlyres/9C7E382B-2536-47CE-84B4-9A883ECFA040/0/Guidance_Doc62DGR_50.pdf).

Annex 6: Criteria for defining infected areas and disease control zones

Infected area

An area classified as an *infected area* (IA) will be a defined area (e.g. village, farm) in which highly pathogenic avian influenza (HPAI) disease or a highly virulent strain of AI virus exists or is believed to exist. An IA will be subject to quarantine. A low pathogenic AI (LPAI) virus may be declared an agent for eradication if it has the potential to mutate into the more virulent HPAI.

Dangerous contact place

An area classified as a *dangerous contact place* (DCP) will be one that contain birds, poultry products or poultry wastes that have recently been introduced from an IA (usually up to 21 days before the premises were declared infected) and are likely to be infected or contaminated, or one that contains any of these items that may have been in substantial contact with people, vehicles and equipment associated with an IA within three days.

Suspect place

An area classified as a *suspect place* (SP) will be one that contains birds that have possibly been exposed to an AI virus, such that quarantine and surveillance, but not pre-emptive slaughter, are warranted. In addition, a place containing birds not known to have been exposed to an AI virus but showing clinical signs requiring differential diagnosis will be classified SP.

This is a temporary classification, and an area designated SP should be treated as infected until determined otherwise. High priority should be given to clarifying the status of the suspect birds so that the area can be reclassified either as an IA where appropriate quarantine and movement controls can be implemented, or as free from disease, in which case no further disease control measures are required.

Restricted area

A *restricted area* (RA) will be a relatively small, declared area compared with a *control area* (CA) around an IA. Movement out of the area will, in general, be prohibited, while movement into the area would be allowed. Multiple RAs may exist within one CA.

The RA does not need to be circular but can have an irregular perimeter, provided the boundary is initially an appropriate distance from the nearest IA, DCP or SP. This distance will vary depending on the size and nature of the potential source of virus, but it will be approximately 1–5 km around the IA, depending on the density of the poultry premises. The boundary could be the perimeter fence of the IA if the IA is in an isolated location. The boundary in a densely populated area will take into account the distribution of susceptible

birds and traffic patterns to markets, service areas, abattoirs and areas that constitute natural barriers to movement. If possible, hatcheries should be kept out of the RA.

Control area

The *control area* (CA) will be a larger declared area around the RA(s). Initially, it could be as large as a province. Restrictions in the CA will reduce the risk that disease can spread from the RA(s). The boundary of the CA will be adjusted as confidence about the extent of the outbreak becomes clearer, but it must remain consistent with the OIE *Code* chapter on surveillance and zoning (Chapter 1.4.3). In general, surveillance and movement controls will be less intense, and animals and products may be permitted to move under permit from the area.

The declaration of a CA also helps to control the spread of the outbreak from within the RA. The CA is a buffer zone between the RA and the rest of the country. The boundary does not have to be circular or parallel to that of the RA, but it should be 2–10 km from the boundary of the RA. In general, the movement of possibly contaminated things and materials within the CA is allowed, but movement out of the CA without CVO approval is prohibited. This type of control area allows reasonable commercial activities to continue.

NB: In declaring RAs and CAs, the areas must be no larger than necessary, thus restricting the number of properties to be quarantined to only those deemed prudent. If flocks in a quarantine area are not depopulated, then the cost of keeping the birds beyond their normal market age could be substantial.

International considerations

Under OIE *Code* definitions, an *infected zone* is a clearly defined territory in which a disease (listed in the *Code*) has been diagnosed. This area must be clearly defined and decreed by the veterinary authorities in accordance with the environment and the different ecological and geographical factors, as well as all the epidemiological factors and the type of husbandry being practised. The territory in question should have a radius from the centre or centres of the disease of at least 10 km in areas with intensive livestock raising, and 50 km in areas where extensive livestock raising is practised.

In May 1993, the European Union published a decision laying down the criteria for classifying "third countries" with regard to avian influenza and Newcastle disease. Annex C, point 4, of this decision states:

> *Around confirmed outbreaks of disease a protection zone with a minimum radius of 3 km and a surveillance zone with a minimum radius of 10 km shall be implemented. In these zones stand-still measures and controlled movements of poultry shall be in force until at least 21 days after the end of disinfection operations on the infected holding. Before lifting the measures in these zones the authorities shall carry out the necessary inquiries and sampling of the poultry holdings to confirm that disease is no longer present in the region concerned.*

Nonetheless, the practicality of declaring a zone, the intensity of the industry and the transmissibility of virus causing an outbreak might mean a decision is taken to declare larger areas than those defined by the EU.

Annex 7: Leaflet example

BIRD FLU (HIGHLY PATHOGENIC AVIAN INFLUENZA)

The purpose of this leaflet is to provide the public, especially poultry farmers and those responsible for meat markets, with basic information on avian influenza, commonly known as "bird flu". This leaflet also informs them about the rights and responsibilities in case of eventual disease outbreaks.

WHAT IS BIRD FLU?

Bird flu (avian influenza) is a highly contagious viral disease of poultry and other birds. According to the virulence (the severity of disease manifestations), the bird flu virus is often characterized as:

- highly pathogenic – causing illness with high a death rate (over 75 percent); or
- low pathogenic – causing mild signs of disease, but in case of secondary infections causing serious problems with death rates of up to 50 percent.

Some low pathogenic types can change over time to become highly pathogenic.

A current strain of avian flu virus, known as H5N1, is circulating in many countries in Southeast Asia and has been confirmed in the Russian Federation, Romania, Croatia, Turkey and Egypt. The H5N1 can also cause disease in humans.

WHO CAN BE INFECTED BY BIRD FLU?

Domestic poultry – chickens and turkeys – are most often affected, while ducks and geese often develop only mild signs of the disease. Wild birds, especially wild ducks, may be naturally resistant to the infection and do not show clinical signs of the disease.

Birds that do not show signs of the disease can still carry the virus, and they therefore represent a danger for the introduction of the virus in poultry operations.

HOW DOES THE DISEASE SPREAD?

The main sources of infection in poultry are the following:

- live infected birds, even if they do not appear sick;
- faecal droppings and discharges from sick birds;
- dead birds; and
- contaminated objects, including equipment (e.g. egg crates, cages), shoes or clothing and contaminated ground.

It is believed that the disease can be spread over long distances by migrating birds (especially wild ducks and geese, but possibly other waterbirds or shorebirds). If infected wild birds have contact with domestic poultry during their resting times along their migrating routes, transmission of the virus could occur.

Within a country, the disease is most commonly spread in poultry through the movement of people, birds and goods in an infected area, and through marketing practices that cause infected poultry to come into contact with healthy birds. Humans play a very important role in spreading the disease, because the virus can easily be carried on dirty clothes, shoes, contaminated equipment and vehicles, and it can be spread through the transportation of sick poultry.

Though this means of spreading is rare, the disease can be introduced by importing healthy live poultry or poultry products (meat, unprocessed feathers, laying eggs, etc.). The virus can also be introduced to an unaffected area or country through illegal trade, especially trade in live birds.

HOW TO RECOGNIZE THE DISEASE IN THE FLOCK

Bird flu spreads very quickly within the flock, so almost all units will be infected in a very short time and birds may die within days of being infected. The spread of the disease is likely to be slower in layers (chickens that are used to produce eggs) because they are often in cages and do not mix with each other.

Signs of disease are:

- depression and lack of appetite;
- drastic drop in egg production;
- swollen head and neck;
- dark and swollen wattles and combs;
- bleeding under the skin; and
- sudden death, which can reach 100 percent of the flock.

If any of your birds show these signs, you should immediately report to the nearest veterinary station or to the veterinary inspector. Failure to notify the authorities could put more animals – and even humans – at risk of becoming infected.

HOW TO PREVENT BIRD FLU

Basic prevention measures include the following:

- Decrease the opportunity for wild birds to come into contact with domestic poultry through the use of protective nets, or by keeping the poultry in enclosed and protected buildings.
- Apply biosafety measures:
  - Fence the farms to keep unwanted animals and visitors out. Lock doors!
  - Disinfect vehicles before they enter the farm.
  - Prohibit the entrance of unauthorized people to the farm.
  - Establish disinfection areas (e.g. for foot baths) at the entrance to the farm or in each of the poultry houses.
  - Use boots and outer clothing that can be cleaned or changed between houses or farms. Use rubber gloves as well.
  - Clean and disinfect all surfaces regularly (e.g. cages, walls, poultry eating and watering areas).
  - Do not borrow equipment from other farms, as these may be contaminated.
  - Disinfect with detergents or hypochlorite solutions.
- Replace animals from within the flock or from controlled and healthy flocks.
- Apply the principle of "all in/all out". This means that all animals in a poultry house are taken off the farm at the same time (for the market), then the ground and house must be cleaned and disinfected, and only then can young stock be introduced into the cleaned house. Lock doors!
- Avoid keeping ducks, chickens and turkeys in the same yard.
- Immediately report an outbreak to the veterinary authorities. Do not sell your animals, and do not eat sick or dead birds or feed them to other animals.

CSIRO

PLANS FOR ERADICATING BIRD FLU

If the disease appears, the following measures should be undertaken:

- Humanely kill all poultry in affected yards, farms and settlement areas.
- Safely dispose of poultry carcasses.
- Disinfect contaminated yards and farms.
- Prohibit the movement of live poultry, meat and other poultry products from contaminated settlement areas.
- Increase control over the movement of people, mechanical equipment, vehicles, etc. from contaminated yards, farms, and settlement areas.
- Implement other measures ordered by the veterinary inspectors.

Owners will be compensated for slaughtered birds as part of the measures for preventing the spread of the disease. Compensation will also be paid for destroyed poultry products and equipment according to their market value.

IS BIRD FLU A THREAT FOR HUMAN HEALTH?

The bird flu virus rarely infects people. If it does, the disease is usually not serious and is often characterized by a reddening of the eyes (conjunctivitis) with mild respiratory symptoms.

However, the highly pathogenic avian influenza H5N1 strain can be a serious health problem and can kill people who are infected. You should therefore avoid contact with birds that are thought to be affected.

HOW DO PEOPLE BECOME INFECTED?

Avian influenza is not a food-borne disease. The bird flu virus is killed by the heat of normal cooking, so there is no risk of contracting avian influenza from properly cooked poultry meat and eggs. Nonetheless, sick chickens should not be eaten, as a sick bird often releases toxins and has other micro-organisms that may pose a danger to you and your family.

WHICH GROUPS OF PEOPLE ARE AT RISK?

People who are at higher risk for infection include those who work with poultry (e.g. breeders, buyers, transporters, slaughterhouse workers and veterinarians) and those who are in contact with infected poultry material or are employed in disease control activities (e.g. veterinarians employed in laboratories). Hunters and ornithologists are at risk only if they have handled sick animals or animals that have died from the avian influenza virus.

HOW CAN PEOPLE BE PROTECTED?

Currently, there is no medicine that can fully protect people from bird flu. The current seasonal vaccines against human flu are effective only against known circulating human influenza. Should you or anyone in your family have a fever with flu-like symptoms, it is advised to seek medical attention immediately.

WHOM DO I CONTACT?

_____

This area to be used for information about the local or regional veterinary authority, diagnostic laboratory, help desk, or call-free number.

_____
_____
_____
_____
_____
_____
_____
_____

NB: *This leaflet was designed by the authorities of The former Yugoslav Republic of Macedonia.*

Annex 8: Avian influenza vaccine producers and suppliers

This list was compiled by FAO's Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES). The manufacturers/suppliers and their vaccines are not necessarily endorsed by FAO, and it is the (importing) country's responsibility to establish independent quality assurance and quality control for safety, purity, potency and efficacy.

Vaccine type	Laboratory	Affiliation	Strain
Monovalent inactivated H5N2 vaccines	Avimex laboratories, Mexico		A/Chicken/Mexico/232/94/ CPA
Monovalent inactivated H5N2 vaccines	Boehringer Ingelheim Vetmedica S.A. de C.V., Mexico	Boehringer Ingelheim Vetmedica, GmBH, Ingelheim am Rhein, Germany	A/Chicken/Mexico/232/94/ CPA
Monovalent inactivated H5N2 vaccines	Ceva Mexico	Ceva Santé Animale SA Z.I. La Ballastière B.P.126-33501 Libourne, France	A/Chicken/Mexico/232/94/ CPA
Monovalent inactivated H5N2 vaccines	Fort Dodge Animal Health	Fort Dodge Animal Health, Overland Park, USA	A/TY/ California/20902/2002
Monovalent inactivated H5N2 vaccines	Chengdu Jianghua Bioproducts Co. Ltd, Ziyang City, Sichuan Province, China	Jianghua Group	A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Guangdong Yongshun Bio-pharm Co. Ltd, Quangdong Province, China		A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Harbin Veterinary Research Institute, Harbin, Heilongjiang Province, China	National Veterinary Research Institute and National Reference laboratory for Avian Influenza, Harbin, Heilongjiang Province, China	A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Lohmann Animal Health		A/Turkey/ Minnesota/3689-1551/81
Monovalent inactivated H5N2 vaccines	Kyoto Biken Laboratories, Inc, Japan		
Monovalent inactivated H5N2 vaccines	Intervet, Boxmeer, The Netherlands		A/Duck/Potsdam/1402/86
Monovalent inactivated H5N2 vaccines	Intervet, Mexico	Intervet, Boxmeer The Netherlands	A/Chicken/Mexico/232/94/ CPA
Monovalent inactivated H5N2 vaccines	Investigación Aplicada S.S. (IASA), Tehuacan, Puebla, Mexico		A/Chicken/Mexico/238/94/ CPA
Monovalent inactivated H5N2 vaccines	Laprovet S.A.S, Tours Cedex 2, France		A/Chicken/Mexico/232/94/ CPA
Monovalent inactivated H5N2 vaccines	Liaonong Yikang Bioengineering Co. Ltd, Liaoyang City, Liaoning Province, China		A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Nanjing Merial Animal Products Co. Ltd, Nanjing City, Jiangsu Province, China	Joint Venture Merial China and China Animal Husbandry Group	A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Medion, Indonesia		A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Qilu Animal Health Products Factory, Ji'nan City, Shandong Province, China		A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Qingdao Yebio Bioengineering Co. Ltd, Qingdao City, Shandong Province, China	National Animal Quarantine Institute of the Ministry of Agriculture	A/Turkey/England/N-28/73

Subtype	Vaccine category	Web site	Commercial name	Comments
H5N2, LP	Inactivated, oil adjuvant	www.avimex.com.mx	Avian Influenza H5	
H5N2, LP	Inactivated, oil adjuvant	www.lineavolvac.com	Volvac AI KV	
H5N2, LP	Inactivated, oil adjuvant	www.ceva.com	FLU-KEM	
H5N2, LP	Inactivated, oil adjuvant		Avian Influenza Vaccine, H5N2 Subtype	Commercialized in USA and Canada
H5N2, LP	Inactivated, oil adjuvant	www.jinghuagroup.net/main.asp		
H5N2, LP	Inactivated, oil adjuvant			
H5N2, LP	Inactivated, oil adjuvant	www.hvri.ac.cn		
H5N2	Inactivated, oil adjuvant	http://www.lahinternational.com/		
H5N1	Inactivated, oil adjuvant	http://www.kyotobiken.jp/	"KYOTO BIKEN" POULSAVER AI	
H5N2, LP	Inactivated, oil adjuvant	www.intervet.com	Nobilis Influenza H5N2	
H5N2, LP	Inactivated, oil adjuvant	www.intervet.com	Nobilis Influenza H5	
H5N2, LP	Inactivated, oil adjuvant	www.iasa.com.mx	Aerovac AI	Undiluted spraying only (fine spray)
H5N2, LP	Inactivated, oil adjuvant	www.laprovet.fr/index_eng.html	ITA-FLU	
H5N2, LP	Inactivated, oil adjuvant			
H5N2, LP	Inactivated, oil adjuvant			
H5N2, LP	Inactivated, oil adjuvant		Medivac AI	
H5N2, LP	Inactivated, oil adjuvant	www.qiludb.com		
H5N2, LP	Inactivated, oil adjuvant	www.yebio.com.cn		

Vaccine type	Laboratory	Affiliation	Strain
Monovalent inactivated H5N2 vaccines	Vaksindo, Indonesia		A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Zhaoqing Dahua agriculture Bio-pahrm Co. Ltd, Zhaoqing City, Guangdong, China	Veterinay College of Southern China Agriculture University	A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Zhengzhou Bio-pharm Co. Ltd, Zhengzhou City, Shandong Province, China	China Animal Husbandry Group	A/Turkey/England/N-28/73
Monovalent inactivated H5N2 vaccines	Influenza and ND	Intervet, Mexico	
Monovalent inactivated H5N9 vaccines	Biomune vaccines, Lenexa - Kansas, USA	Ceva Santé Animale SA	A/Turkey/Wisconsin/68
Monovalent inactivated H5N9 vaccines	Merial Italia Spa	Merial	A/Turkey/Wisconsin/68
Monovalent inactivated H5N9 vaccines	Merial Italia Spa	Merial	A/Chicken/Italy/22A/98
Monovalent inactivated H5N6 vaccines	Intervet, Boxmeer The Netherlands	Intervet	A/Duck/Potsdam/2243/84
Monovalent inactivated H5N9 vaccines	Fort Dodge Animal Health	Fort Dodge Animal Health, Overland Park, USA	A/TY/Wisconsin/1968
Monovalent inactivated H5N9 vaccines	Fort Dodge Animal Health	Fort Dodge Animal Health, Overland Park, USA	A/CK/Italy/22A/H5N9/1998
Monovalent inactivated H5N1 vaccines	Harbin Veterinary Research Institute, Harbin, Heilongjiang Province, China		A/Goose/Guangdong/1996
Monovalent inactivated H5N1 vaccines	Medion, Indonesia		A/Ck/Legok/2003
Monovalent inactivated H5N1 vaccines	Pusvetma, Indonesia	Ministry of Agriculture, Republic of Indonesia	A/Ck/Legok/2003
Monovalent inactivated H5N1 vaccines	Vaksindo, Indonesia		A/Ck/Legok/2003
Monovalent inactivated H5N1 vaccines	Veterinary Research Institute, Lahore, Pakistan	Ministry of Food, Agriculture and Livestock, Province of Punjab, Pakistan	A/Ck/Mansehra/2006
Monovalent inactivated H5N1 vaccines	Sindh Vaccine Production Centre, Karachi, Pakistan	Ministry of Food, Agriculture and Livestock, Province of Sindh, Pakistan	A/Ch/Mansehra/2006
Monovalent inactivated H5N1 vaccines	Ottoman Pharmaceuticals, Lahore, Pakistan	Private company	
Monovalent inactivated H5N1 vaccines	Biolabs (pvt) Ltd, Islamabad, Pakistan	Private company	A/Ch/Mansehra/2006
Monovalent reverse genetics H5 vaccines	Fort Dodge Animal Health, Overland Park, USA		rg-A/ck/VN/C58/04 with N3 gene from A/Duck/ Germany/1215/73 (H2N3) and six internal genes from PR8 vaccine strain

Subtype	Vaccine category	Web site	Commercial name	Comments
H5N2, LP	Inactivated, oil adjuvant		Vaksiflu N2	
H5N2, LP	Inactivated, oil adjuvant	http://www.un-pur.org/gongyingshangmulu/yiyao/zhaoqing/zhaoqing.htm		
H5N2, LP	Inactivated, oil adjuvant			
H5N2			Nobilis Influenza H5+ND	
H5N9, LP	Inactivated, oil adjuvant		Layermune AIV H5N9	
H5N9, LP	Inactivated, oil adjuvant	http://it.merial.com	Gallimune Flu H5N9	
H5N9, LP	Inactivated, oil adjuvant	http://it.merial.com	Gallimune Flu H5N9	
H5N6, LP	Inactivated, oil adjuvant	www.intervet.com	Nobilis Influenza H5N6	
H5N9, LP	Inactivated, oil adjuvant		Avian Influenza Vaccine, H5N9 Subtype	Commercialized in USA and Canada
H5N9, LP	Inactivated, oil adjuvant		POULVAC Flufend i-AI H5N9	Commercialized in EU
H5N1, HP	Inactivated, oil adjuvant	www.hvri.ac.cn		
H5N1, HP	Inactivated, oil adjuvant		Medivac	
H5N1, HP	Inactivated, aluminiumhydroxyd		Afluvet	
H5N1, HP	Inactivated, oil adjuvant		Vaksiflu AI	
H5N1, HP	Inactivated, oil adjuvant		AI-H5 Vaccine	
H5N1, HP	Inactivated, oil adjuvant		AI-H5 Vaccine	
H5N1, HP	Inactivated, oil adjuvant		Fluvac-H5	
H5N1, HP	Inactivated, oil adjuvant		Biovac-AI	
H5N3 RG	Reverse genetic, oil adjuvant	www.fortdodge.eu	Poulvac Flu Fend H5N3 RG	

Vaccine type	Laboratory	Affiliation	Strain
Monovalent reverse genetics H5 vaccines	Harbin Veterinary Research Institute, Harbin, Heilongjiang Province, China		A/Goose/Guangdong/1996 (Re-1), BHG/QH/05 (Re-3); DK/AH/06 (Re-5) or CK/SX/06 (Re-4) and PR8 backbone
Monovalent reverse genetics H5 vaccines	Qingdao Yebio Bioengineering Co. Ltd, Qingdao City, Shandong Province, China		A/Goose/Guangdong/1996 (Re-1), BHG/QH/05 (Re-3); DK/AH/06 (Re-5) or CK/SX/06 (Re-4)and PR8 backbone
Monovalent reverse genetics H5 vaccines	Zhengzhou Bio-pharm Co. Ltd, Zhengzhou City, Shandong Province, China	China Animal Husbandry Group	Reverse genetic virus from A/Goose/Guangdong/1996 (re-1), BHG/QH/05 (Re-3); DK/AH/06 (Re-5) or CK/SX/06 (Re-4)and a PR8 vaccine strain backbone
Monovalent reverse genetics H5 vaccines	Nanjing Merial Animal Products Co. Ltd, Nanjing City, Jiangsu Province, China	Joint Venture Merial China and China Animal Husbandry Group	A/Goose/Guandong/1996 and PR8 backbone
Monovalent reverse genetics H5 vaccines	IBP-Shigeta, Bogor, Indonesia	PT IPB Shigeta Animal Pharmaceuticals	Reverse genetic virus from A/Ck/Legok/2003
Recombinant vaccines with H5 component	Harbin Veterinary Research Institute, Harbin, Heilongjiang Province, China		Avian pox virus with a cDNA insert of the H5 and N1 gene from A/Goose/Guangdong/1996
Recombinant vaccines with H5 component	Harbin Veterinary Research Institute, Harbin, Heilongjiang Province, China		Live Newcastle disease virus (LaSota) and H5 A/Barheaded goose/Qinghai/3/2005
Recombinant vaccines with H5 component	Merial Select (US)	Merial	Fowlpox virus with cDNA insert of H5 gene from A/Turkey/Ireland/83
Bivalent inactivated AI vaccines	Ceva, Mexico	Ceva Santé Animale SA (France)	A/Chicken/Mexico/232/94
Bivalent inactivated AI vaccines	Fort Dodge Animal Health	Fort Dodge Animal Health, Overland Park, USA	A/CK/Italy/22A/H5N9/1998&A/CK/Italy/1067/H7N1/1999
Bivalent inactivated AI vaccines	Merial Italia Spa	Merial	A/chicken/Italy/1067/99 (H7N1) and A/chicken/Italy/22A/98 (H5N9)
Bivalent inactivated AI vaccines	Qingdao Yebio Bioengineering Co. Ltd, Qingdao City, Shandong Province, China	National Animal Quarantine Institute of the Ministry of Agriculture	No information available
Bivalent inactivated AI vaccines	Sindh Vaccine Production Centre, Karachi, Pakistan	Ministry of Food, Agriculture and Livestock, Province of Sindh, Pakistan	
Bivalent inactivated AI vaccines	Avicina Laboratories, Lahore, Pakistan		
Bivalent inactivated AI vaccines	Biolab (pvt) Ltd, Rawalpindi, Pakistan		
Bivalent inactivated AI vaccines	Otoman Pharma , Lahore, Pakistan		
Monovalent inactivated H7 vaccines	Biomune vaccines, USA	Ceva Santé Animale SA	A/Chicken/New York/273874/03

Subtype	Vaccine category	Web site	Commercial name	Comments
H5N1, RG	Reverse genetic, oil adjuvant	www.hvri.ac.cn		
H5N1, RG	Reverse genetic, oil adjuvant			
H5N1 RG	Reverse genetic, oil adjuvant			
H5N1, RG	Reverse genetic, oil adjuvant			
H5N1 RG	Reverse genetic, oil adjuvant	www.blst.co.id	Bird Close 5.1	
H5 derived from H5N1 HP	Live recombinant, freeze dried	www.hvri.ac.cn		Subcutaneous administration
H5N1 HP	Live recombinant NDV vectored H5, freeze dried	www.hvri.ac.cn		Mucosal administration
H5 derived from H5N8 LP	Live recombinant, freeze dried, subcutaneous administration	www.merial.com	Trovac AIV-H5 produced in US, Atlanta	
H5N2 LP + La Sota NDV	Inactivated, oil adjuvant		NEW-FLU-KEM	
H5N9/H7N1 bivalent	Oil adjuvant		POULVAC Flufend i-AI H5N9 H7N1	Commercialized in EU
H7N9 and H5N9	Inactivated, oil adjuvant	http://it.merial.com	BioFlu H7N1 and H5N9	
H5N2 LP and H9	Inactivated, oil adjuvant,	www.yebio.com.cn		
H7N3 and H9N2 vaccine	Inactivated			
H7N3 and H9N2	Inactivated			
H7N3 and H9N2	Inactivated			
H7N3 and H9N2	Inactivated			
H7N2	Inactivated, oil adjuvant		Layermune AIV H7N2	

Vaccine type	Laboratory	Affiliation	Strain
Monovalent inactivated H7 vaccines	Biomune vaccines, USA	Ceva Santé Animale SA	A/Turkey/Utah/24721-10/95
Monovalent inactivated H7 vaccines	Lohmann Animal Health		
Monovalent inactivated H7 vaccines	Intervet, Netherlands/Spain	Intervet	A/Chicken/Italy/473/99
Monovalent inactivated H7 vaccines	Intervet		A/duck/Potsdam/15/80
Monovalent inactivated H7 vaccines	Merial Italia Spa	Merial	
Monovalent inactivated H7 vaccines	Merial		
Monovalent inactivated H7 vaccines	Sindh Vaccine Production Centre, Karachi, Pakistan	Ministry of Food, Agriculture and Livestock, Province of Sindh, Pakistan	
Monovalent inactivated H7 vaccines	Avicina Laboratories, Lahore, Pakistan		
Monovalent inactivated H7 vaccines	Biolab (pvt) Ltd, Rawalpindi, Pakistan		
Monovalent inactivated H7 vaccines	Otoman Pharma , Lahore, Pakistan		
Monovalent inactivated H7 vaccines	Fort Dodge Animal Health, Overland Park, USA	Fort Dodge Animal Health, Overland Park, USA	A/CK/ NewYork/273874/2003
Monovalent inactivated H7 vaccines	Fort Dodge Animal Health, Overland Park, USA	Fort Dodge Animal Health, Overland Park, USA	A/TY/Oregon/1971
Monovalent inactivated H7 vaccines	Fort Dodge Animal Health, Overland Park, USA	Fort Dodge Animal Health, Overland Park, USA	A/CK/Italy/1067/H7N1/1999
Monovalent inactivated H9 vaccines	Merial		
Monovalent inactivated H9 vaccines	Sindh Vaccine Production Centre, Karachi, Pakistan	Ministry of Food, Agriculture and Livestock, Province of Sindh, Pakistan	
Monovalent inactivated H9 vaccines	Avicina Laboratories, Lahore, Pakistan		
Monovalent inactivated H9 vaccines	Biolab (pvt) Ltd, Rawalpindi, Pakistan		
Monovalent inactivated H9 vaccines	Otoman Pharma , Lahore, Pakistan		
Monovalent inactivated H9 vaccines	Razi Vaccine and Serum Research Institute, Iran (Islamic Republic of)		
Monovalent inactivated H9 vaccines	ABIC Biological Laboratories TEVA Ltd, Israel		
Monovalent inactivated H9 vaccines	Biovac, Israel		
Monovalent inactivated H9 vaccines	Shafit Biological Laboratories Ltd, Israel		
Monovalent inactivated H9 vaccines	Intervet		A/CK/UAE/415/99

Subtype	Vaccine category	Web site	Commercial name	Comments
H7N3	Inactivated, oil adjuvant		Layermune AIV H7N3	
H7N3	Inactivated, oil adjuvant	http://www.lahinternational.com/		
H7N1	Inactivated, oil adjuvant	www.intervet.com	Nobilis Influenza H7N1	
H7N7	Inactivated, oil adjuvant	www.intervet.com	Nobilis Influenza H7N7	
H7N1		http://it.merial.com	GALLIMUNE FLU™ (for use in Italy)	
H7N1 or H7N3				
H7N3	Inactivated			
H7N3	Inactivated			
H7N3	Inactivated			
H7N3	Inactivated			
H7N2	Oil adjuvant		Avian Influenza Vaccine, H7N2 Subtype	Commercialized in USA and Canada
H7N3	Oil adjuvant		Avian Influenza Vaccine, H7N3 Subtype	Commercialized in USA and Canada
H7N1	Oil adjuvant		POULVAC Flufend i-AI H7N1	Commercialized in EU
H9N2	Inactivated, oil adjuvant	www.merial.com	Gallimune H9	
H9N2	Inactivated			
H9N2	Inactivated			
H9N2	Inactivated			
H9N2	Inactivated			
H9N2	Inactivated, oil adjuvant	http://www.rvsri.com/		
H9N2	Inactivated, oil adjuvant	http://www.abic-vet.com		
H9N2	Inactivated, oil adjuvant	http://www.biovac.co.il		
H9N2	Inactivated, oil adjuvant	http://www.shafit.co.il/		
H9N2	Inactivated, oil adjuvant	http://www.avian-influenza.com/	Nobilis Influenza H9N2	

FAO ANIMAL PRODUCTION AND HEALTH MANUALS

1. Small-scale poultry production, 2004 (E, F)
2. Good practices for the meat industry, 2006 (E, F, S, Ar)
3. Preparing for highly pathogenic avian influenza, 2006 (E, Ar, S[e], F[e], M[e])
3. Revised version, 2009 (E)
4. Wild bird HPAI surveillance – a manual for sample collection from healthy, sick and dead birds, 2006 (E, F, R, Id, S[e], Ar[e], C[e], Ba**)
5. Wild birds and avian influenza – an introduction to applied field research and disease sampling techniques, 2007 (E, F, R, Id, Ba, S**)
6. Compensation programs for the sanitary emergence of HPAI-H5N1 in Latin American and the Caribbean, 2008 (E[e], S[e])
7. The AVE systems of geographic information for the assistance in the epidemiological surveillance of the avian influenza, based on risk, 2009 (E[e], S[e])
8. Preparation of African swine fever contingency plans, 2009 (E)

Availability: November 2009

Ar	-	Arabic	Multil	-	Multilingual
C	-	Chinese	*		Out of print
E	-	English	**		In preparation
F	-	French	[e]		E-publication
P	-	Portuguese			
R	-	Russian			
S	-	Spanish			
M	-	Mongolian			
Id	-	Bahasa			
Ba	-	Bangla			

The *FAO Animal Production and Health Manuals* are available through the authorized FAO Sales Agents or directly from Sales and Marketing Group, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy.

FAO ANIMAL HEALTH MANUALS

1. Manual on the diagnosis of rinderpest, 1996 (E)
2. Manual on bovine spongifom encephalophaty, 1998 (E)
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15. Preparation of Rift Valley fever contingency plans, 2002 (E, F)
16. Preparation of foot-and-mouth disease contingency plans, 2002 (E)
17. Recognizing Rift Valley fever, 2003 (E)

Highly pathogenic avian influenza (HPAI) represents a threat to poultry industries worldwide and to people's livelihoods, and a potential threat to human health. The international community has a vested interest in minimizing the spread of this disease. Countries may be under threat of introduction of HPAI through unregulated poultry trade and marketing practices and, on rare occasions, exposure of poultry to wild birds, especially waterfowl.

The Food and Agriculture Organization of the United Nations and the World Organisation for Animal Health prepared the first edition of this manual to help national animal health authorities and other stakeholders prepare for a possible incursion of HPAI, detect disease as soon as possible and respond as rapidly as possible to contain the disease. This second edition reflects lessons learned and provides additional details.

The manual offers practical advice on disease identification, pathology and diagnosis; detection, response and control strategies; and biosecurity measures to prevent outbreaks. It is an invaluable source of useful information for anyone involved in poultry-keeping and animal health practices.

ISBN 978-92-5-106249-4 ISSN 1810-1119

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I0808E/1/10.09/2100