

AI VACCINATION STRATEGY

NOTE: FEDERAL AND STATE APPROVAL REQUIRED IN ADVANCE

BACKGROUND

The control of AI in poultry has historically relied on quarantine and elimination of infected flocks. This strategy allows countries to quickly eliminate disease and return to normal trade. Vaccination has not been commonly used for control because killed vaccines interfere with routine serologic surveillance and therefore, with the ability to export poultry.

- Vaccination of Rhode Island poultry against avian influenza virus may be considered in an outbreak situation as a tool in the control and eradication of the avian influenza virus in poultry.
- Vaccination of a Rhode Island premises must be approved by USDA APHIS and a premises must be authorized by the RI DEM Division of Agriculture (DAG) prior to use.
- Vaccinated flocks will be quarantined by the DAG. Controlled movement may be allowed under permit.
- Records of vaccinated flocks will be maintained by the DAG and will be made available to USDA APHIS upon request. Records will include name, address, and contact information of the flock owner, name, address, and contact information of the premises owner where the birds are located, age, type, and number of birds, housing information, date of vaccine, vaccine label and administration information, and other pertinent information as needed.
- New vaccines may become available and will be considered with the approval of USDA APHIS.

VACCINATION INFORMATION

- **KILLED VACCINE:** Inactivated (killed) avian influenza vaccine is an oil-emulsion product that requires subcutaneous injection of individual birds. The vaccine can be administered safely at any age and will not spread between birds or from parent to offspring. However, maternal antibodies can be passed to progeny, resulting in seropositive test results in progeny.
 - **INACTIVATED HOMOLOGOUS VACCINES:** These vaccines contain the same AI strain (autogenous vaccines) as the one causing problems in the field. They have been shown to be effective in preventing clinical disease and in reducing the amount of virus shed in the environment. It is not possible to differentiate vaccinated birds from fieldexposed birds on laboratory tests. Therefore, unvaccinated sentinels must be maintained in the flock and monitored for infection.
 - **INACTIVATED HETEROLOGOUS VACCINES:** The virus strain used in these vaccines is of the same hemagglutinin (H) type as the field virus but a different neuraminidase (N) type. Following field exposure, clinical protection and reduction in viral shedding are ensured by the immune

reaction induced by the homologous H group, while antibodies against the neuraminidase induced by the field virus can be used as a marker of field exposure. Standard ELISA and AGID tests cannot be used to differentiate vaccinated from field-exposed birds. Vaccinated birds can be identified using HI (NVSL) or an ELISA (“NELISA”) test that detects antibodies against the NS1 protein of avian influenza. Field-exposed birds will test positive on the test since they will have antibodies to the NS1 protein, but vaccinated birds should test negative (USDA ARS *Abstract A Diagnostic Aid for Differentiating Infected from Vaccinated Poultry Based on Antibodies to the Nonstructural (Ns1) Protein of Influenza a Virus* – Tumpey, Terrence, et al.)

- **RECOMBINANT VACCINE:** The avian influenza vaccine designated TROVAC™-AIV H5(TROVAC-H5) was developed by inserting the hemagglutinin (HA) gene of an AI H5 subtype isolate into the genome of a fowlpox vaccine strain. This recombinant vaccine was granted a license in the United States for emergency use in 1998. It is reported that one injection of TROVAC-H5 may protect chickens against AI-induced mortality and morbidity for at least 20 weeks and may significantly decrease shedding of virus. Advantages of the TROVAC-H5 vaccine over inactivated AI vaccines are: (a) single administration at 1 day of age and early onset (1 week) of protection, (b) easy monitoring of AI infection in vaccinated flocks with agar gel precipitation (AGP) and enzyme-linked immunosorbent assay (ELISA) used as tests to differentiate infected from vaccinated animals and (c) no residue problem due to adjuvant (USDA ARS *Development and Use of Fowl Pox Vectored Vaccines for Avian Influenza* – Bublot, Michel et al.)

VACCINATION STRATEGY

- For containment of an outbreak of low pathogenic AI in poultry, ring vaccination and other vaccination strategies will be considered as necessary. The Rhode Island DEM Division of Agriculture (DAG) must obtain approval from USDA APHIS prior to allowing vaccination of poultry.
- Vaccination of birds on a premises must be authorized by the DAG prior to the vaccination of poultry on that premises.
- Selection of premises for vaccination will be based on containment strategies specific to the outbreak.
- If a premises is approved for vaccination, vaccination on that premises must include all flocks in appropriate production cycles.
- Vaccination of clinically normal flocks may be carried out without additional testing. If birds in a flock considered for vaccination are showing clinical signs of AI, that flock will be tested.
- Vaccine label directions, including age of birds, route of administration, dosage, frequency of administration, vaccine handling, and slaughter withdrawal time must be followed.

- **HOMOLOGOUS VACCINATION STRATEGY:**
 - One hundred (100) non-vaccinated birds (or 10 percent of the flock, whichever is less) must be permanently identified with state-issued leg bands and placed randomly throughout each poultry house to serve as non-vaccinated sentinel birds. Sentinel birds must be of the same species as the birds to be vaccinated, and ideally will be of a different color to allow rapid identification of sentinels. All remaining birds will be vaccinated with an inactivated homologous vaccine approved by USDA APHIS and the DAG.
 - Vaccination crews will follow strict biosecurity procedures as approved by the DAG.
 - Vaccinated flocks will be monitored in the following manner:
 - Vaccination records must be maintained and must include all vaccine label information, dose and route of administration, date of administration, and name of person administering the vaccine.
 - Sentinel band numbers must be recorded and records of sentinel testing must be maintained.
 - All medication or vaccinations given to the flock must be recorded.
 - All sentinel birds must be accounted for during the lifetime of the flock.
 - Any and all unusual morbidity or mortality in sentinel birds and vaccinated birds must be reported to the DAG, and sick and dead birds must be submitted to a DAG-designated laboratory.
 - Thirty (30) serum and swab (cloacal swabs, if waterfowl) samples from non-vaccinated sentinel birds will be tested for AI using AGID and virus detection testing every 21 days until the DAG has lifted the testing requirement.

- **HETEROLOGOUS VACCINATION STRATEGY:**
 - All birds in the flock will be vaccinated with inactivated vaccine approved by USDA APHIS and the DAG and containing an “N” type different from the challenge virus.
 - Vaccination crews will follow strict biosecurity procedures as approved by the DAG.
 - Vaccinated flocks will be monitored in the following manner:
 - Vaccination records must be maintained and must include all vaccine label information, dose and route of administration, date of administration, and name of person administering the vaccine.
 - All medication or vaccinations given to the flock must be recorded.
 - Any and all unusual morbidity or mortality in the flock must be reported to the DAG and sick and dead birds must be submitted to a DAG-designated laboratory.
 - Thirty (30) serum and swab (cloacal swabs, if waterfowl) samples from vaccinated birds will be tested for AI using DIVA and virus detection testing every 21 days until the DAG has lifted the testing requirement.

- **RECOMBINANT LIVE VACCINE STRATEGY:**
 - All birds in the flock will be vaccinated with recombinant live vaccine approved by USDA APHIS and the DAG.
 - Vaccination crews will follow strict biosecurity procedures as approved by the DAG.
 - Vaccinated flocks will be monitored in the following manner:
 - Vaccination records must be maintained and must include all vaccine label information, dose and route of administration, date of administration, and name of person administering the vaccine.
 - All medication or vaccinations given to the flock must be recorded.
 - Any and all unusual morbidity or mortality in the flock must be reported to the DAG, and sick and dead birds must be submitted to a DAG-designated laboratory.
 - Thirty (30) serum and swab (cloacal swabs, if waterfowl) samples from vaccinated birds will be tested for AI using DIVA and virus detection testing every 21 days until the DAG has lifted the testing requirement.

DISCONTINUATION OF VACCINATION

Vaccination of birds will be discontinued at the discretion of USDA APHIS and the DAG.

MOVEMENT OF BIRDS

All vaccinated flocks, including birds in zoological collections, will remain under quarantine for the life of the flock and may only be moved under a permit issued by the DAG.

MOVEMENT OF EGGS

Eggs from vaccinated flocks may be moved with a permit issued by the DAG.

RESPONSE TO A POSITIVE FLOCK

If any non-vaccinated sentinel birds or vaccinated birds test positive for AI or have clinical signs consistent with AI, oropharyngeal swabs (or cloacal swabs, if waterfowl) for virus detection testing will be collected from 30 sentinel birds (if present) and 150 vaccinated birds per poultry house.

The RI DEM Division of Agriculture reserves the right to amend the above mentioned requirements for Avian Influenza with the goal of any changes still being to prevent, contain and eliminate the disease. Changes to the general guidelines of the protocol may result from information including, but not limited to, virus strain, pathogenicity, morbidity and mortality, movement of birds and products, and additional epidemiological information obtained as a result of avian influenza investigations.