



GOLDEN
HARVEST

AviPro[®]
Vaccines

All in Control

A fluffy, yellow chick is the central focus, standing on three large, light-brown eggs. The scene is set in a lush green field with several yellow dandelions scattered around. The chick is looking towards the right of the frame.

Golden Harvest
Vaccination
MANAGEMENT GUIDE

AviPro® ND VISOTA

Description: A live virus vaccine of chicken embryo origin presented in lyophilized form, (B1 type, Lasota strain).

Indications: This product is recommended for both the initial vaccination and re-vaccination of chickens as an aid in the prevention of Newcastle Disease.

Administration: Drinking water or coarse spray or eye dropping.

AviPro® ND LASOTA (Cloned)

Indication: This product is recommended for both the initial vaccination and re-vaccination of chickens as an aid in the prevention of Newcastle Disease.

Administration: Drinking water or coarse spray or eye dropping.

AviPro® THYMOVAC

Description: Live vaccine (freeze-dried) for poultry against Chicken Infectious Anaemia (Cux-1 strain).

Administration: Drinking water. Vaccinate from 8 weeks of age, at least 6 weeks before on set of lay.

AviPro® ND-IB SOHOL

Description: A live virus vaccine of chicken embryo origin containing the Lasota strain of Newcastle Disease virus, which is of lentogenic B1 Type and the Holland strain, a Massachusetts type of Infectious Bronchitis virus. The vaccine is presented in lyophilized form.

Indication: This product is used for initial vaccination and re-vaccination of chickens as an aid in the prevention of Infectious Bronchitis, and Newcastle Disease.

Administration: Drinking water or Intranasal or intra-ocular or spray.

AviPro® AE

Description: Live vaccine (aqueous suspension) for poultry against Avian Encephalomyelitis (1143 Calnek strain).

Indication: For administration via drinking water. The vaccine should not be given before the 10th week of life and not later than 4 weeks before the start of laying.

AviPro® POX CEO

Description: Live vaccine (freeze-dried) for poultry against Fowl Pox. A chick embryo propagated product (FPC strain).

Indications: This product is recommended for the initial vaccination at 5 weeks of age or older and re-vaccination of chickens as an aid in the prevention of Fowl Pox.

Administration: Wing-web application.

AviPro® PRECISE

Description: Live intermediate vaccine (freeze-dried) for poultry against Infectious Bursal (Gumboro) Disease (LC-75 strain).

Administration: Drinking water from 7 to 12 days.

AviPro® IBD XTREME

Description: Live intermediate plus vaccine (freeze-dried) for poultry against Infectious Bursal Disease, containing the embryo adapted V217 strain derived from winterfield 2512 strain.

Indications: This vaccine is recommended as an aid in the prevention of Infectious Bursal (Gumboro) Disease in chickens.

Administration: Drinking water from 12 to 21 days.

LOVIT Blue C

It is an effervescent blue granule for use as a water treatment agent when administering live vaccines. Specially formulated to minimize the potential adverse effects of chlorine residue and balance pH, it also contains a food approved dye for visualization of water flow in drinking lines.

Activity Per liter: Sodium hydrogen carbonate – Lactose – Ascorbic acid – Skim milk powder – Sodium carbonate –

Citric acid anhydrate – Patent blue

Recommended dosage: min. 100 g per 800 liters of drinking water or min. 25 g (1 measuring spoon) per 200 liters of drinking water detailed recommendation for more intense coloring available on request.

Packaging: Sachets in cartons of 24 x 100 g net with measuring spoons.

AviPro® 105 ND Chick

Description: Newcastle Disease, B1 Type, Lasota strain.

Indication: Recommended for the vaccination of young chicks as an aid in prevention of Newcastle Disease. Inject subcutaneously using aseptic technique. Vaccinate chick between 1 and 10 days of age. Highly concentrated small dosage (0.1ml/chick) easily injectable with less reaction on skin.

Pack Size: 5000 doses/bottle.



AviPro® 108 FC3 Platinum

Description: A water-oil-water (WOW) emulsion.

Indications: Recommended for the vaccination of chickens against Fowl Cholera caused by Pasteurella Multocida, Type 1, Type 4 and Type 3x4 in chickens. Inject subcutaneously or intramuscularly using aseptic technique between 12 to 16 weeks of age. 0.25 ml dose size.

Pack Size: 500 ml



AviPro® 201 ND-IB

Description: Produced with a high titering strain of Newcastle Disease virus, B1 Type Lasota strain and the Massachusetts strain of Infectious Bronchitis virus, suspended in a stable oil emulsion.

Indications: For the vaccination of breeder hens and replacement pullets as an aid in the prevention of Newcastle Disease and Infectious Bronchitis. Inject subcutaneously using aseptic technique. 0.5 ml dose size.

Pack Size: 500 ml



AviPro® 106 REO

Description: This product is with high titering strains of Avian Reovirus (S1133 and 1733), suspended in a stable oil emulsion.

Indications: Recommended for the vaccination of breeder hens and replacement pullets as an aid to provide passive protection of progeny against Reovirus related malabsorption syndrome. Inject subcutaneously using aseptic technique 0.5 ml dose size from 16 to 20 weeks of age.

Pack Size: 500 ml



AviPro® 104 MG Bacterin

Description: This product is a Formalin inactivated oil-based suspension of a highly immunogenic R strain of Mycoplasma Gallisepticum.

Indications: This product is used as an aid for the control of air sacculitis in chickens associated with Mycoplasma Gallisepticum infections providing a suitable humoral response. Inject subcutaneously using aseptic technique. 0.5 ml dose size from 5 weeks of age or older. Revaccination is recommended in 4 weeks.

Pack Size: 500 ml



AviPro® 304 ND-IB-MG

Description: Inactivated vaccine containing Newcastle Disease (B1 Type, Lasota strain), Infectious Bronchitis virus and Mycoplasma Gallisepticum.

Indications: Recommended for the vaccination of chickens as an aid in the prevention of Newcastle Disease and Infectious Bronchitis (Mass. type) and as an aid for the control of clinical signs associated with Mycoplasma Gallisepticum infection. Inject subcutaneously at 6 weeks of age or older. Revaccinate 3 to 6 weeks later. 0.5 ml dose size.

Pack Size: 500 ml

LOVIT Hepavent Liquid

Specific liquid formulation for poultry, designed for the additional, short-term supplementation via drinking water. LOVIT Hepavent is recommended in periods of stress due to fatty liver syndrome, hepatitis, hepato-renal disfunctions and metabolic disorders particularly in layers.

Activity per litre: Choline Chloride 100,000 mg, L-carnitine 57,000 mg, Betaine 20,000 mg, Sorbitol 150,000 mg, Magnesium 10,000 mg.

Recommended dosage: One ml/2 litres of drinking water over a period of 2 - 3 consecutive days.

LOVIT EC+Se Liquid

A liquid formulation of Vitamin E, C and Selenium designed for the additional, short-term supplementation via the drinking water. LOVIT EC+Se is especially indicated for birds to improve the immune response and in breeding hens in case of fertility problems.

Activity per litre: Vitamin E 80,000 mg, Selenium 100 mg, Vitamin C 100,000 mg.

Recommended dosage: One ml/2 litres of drinking water for minimum 3 days.

LOVIT Cool Liquid

A concentrated well-balanced liquid combination of minerals, trace elements and vitamin C for the systematic short-term supplementation via drinking water. Liquid Cool provides essential body electrolytes and is specially indicated for managing heat stress situations in high performing poultry flocks.

Activity Per Litre: Sodium 2.3%, Potassium 4.9%, Magnesium 0.2%, Vitamin C 33,350 mg, Manganese 5,770 mg, Zinc 4,800 mg.

Recommended Dose: One ml/litre of drinking water over the heat stress period, starting 1 day before and during hot days for 3-10 days. Maio, Ti. Nicae con

LOVIT Breeze Liquid

LOVIT Breeze Liquid is recommended to manage flocks with problems in the respiratory tract such as CRD, infectious coryza etc. It is helpful in prevention of post vaccination reaction in ND and IB in Poultry.

Lovit Breeze Liquid working wonders within the respiratory tract & beyond as an immunomodulatory; stimulates and boosts immune response. Used via drinking water for prevention, combating & alleviation of disease condition whether hot or mild.

Activity Per Litre: 1 litre contains

Vitamin A	1 000 000 I.U.
Eucalyptus oil	170 000 mg
Thyme oil	40 000 mg

Recommended Dose: 100 - 300 ml per 1000 litres of drinking water over a period of 3 - 10 consecutive days, repetition as required.

LOVIT VA+Se Liquid

A well-balanced liquid combination of vitamins and amino acids with selenium designed for the additional, short-term supplementation via drinking water in times of increased vitamin demand. LOVIT VA+Se Liquid is specially indicated for the prevention of hypovitaminosis and amino acid deficiencies in high performing animals during stress situations.

Activity per litre: Vitamin A - 20,000,000 I.U., Vitamin D3 1,000,000 I.U., Vitamin E 6,000 mg, Vitamin K3 2,000 mg, Vitamin B1 1,250 mg, Vitamin B2 2,500 mg, Vitamin B6 1,750 mg, Vitamin B12 7,500 mg, Folic Acid 400 mg, Nicotinamide 18,000 mg, D-Panthenol 5,600 mg, Selenium 33 mg, L-Tryptophan 600 mg, L-Lysine 4,000 mg, DL-Methionine, 4,000 mg, L-Threonine 2,000 mg, Glutamic acid 6,000 mg.

Recommended dosage: One ml/4 litres of drinking water over a period of minimum 3 consecutive days, repetition as required.

LOVIT LC Energy (Optimal feed conversion)

Is an ideally balanced formulation consisting of L-carnitine, betaine, sorbitol and magnesium for application via drinking water. It improves the utilization of feed energy in case of metabolic problems during all critical periods in poultry production. LOVIT LC - Energy also stimulates the intake of feed and water and has positive influence on the functions of the liver and kidneys.

Activity per litre: L-Carnitine 25,000 mg, Betaine 50,000 mg, Sorbitol 100,000 mg, Magnesium 25,000 mg.

Recommended dosage: One ml/litre of drinking water for a period of 2-5 days repetition as required.

LOVIT Phos Plus Liquid

Is a specific liquid formulation of minerals and trace elements in highly available form, designed for the additional, short-term supplementation via drinking water. LOVIT Phos Plus is beneficial in improving the strength of the skeleton and the quality of egg-shell. In addition, it decreases the pH value of the drinking water.

Activity per litre: Phosphorous 10.50%, Calcium 2.20%, Magnesium 1.00%, Sodium 0.75%, Manganese 4,800 mg, Zinc 4,000 mg, Copper 2,500 mg.

Recommended dosage: One ml/2 litres of drinking water over a period of 3 -5 days, repetition as required.

LOVIT Probiotic (Powder)

The synergistic combination of the gut bacterium E. faecium with vitamin D3 and sodium ascorbate promotes a physiological intestinal flora and supports immune defence. A rapidly and completely dissolving powder LOVIT Probiotic is easy to use.

Activity Per Litre: Per kg contains:

E. faecium (DSM 7134) 3.3 x 10¹² CFU,
vitamin D3 200,000 mg, sodium ascorbate 450,000 mg.

Recommended Dose: The recommended dosage is 100 to 250 g per 1,000 litres of drinking water.

Standard Packaging: 10 x 1 kg (100 grams) bags per box.

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INTRODUCTION

1

This book is reference guide to help field staff in the proper use and administration of poultry vaccines. It can be taken as a practical reference to offer standard operating procedures to improve the delivery and efficacy of vaccines in the hatchery and at the farm in order to maximize flock performance and immunity in shaa Allah.

Why Do We Vaccinate?

Correct vaccination is an essential part of a good poultry management program and vital to the success of any poultry operation. Effective preventive procedures such as immunization and biosecurity protect hundreds of millions of birds worldwide from many contagious and deadly diseases and have resulted in improved flock health and production efficiency.

Immunization cannot be a replacement for poor biosecurity and sanitation. Thus, vaccination programs may not protect birds that are under stress or raised in unhygienic conditions.

FOR BREEDERS, WE ALSO WANT TO ACCOMPLISH SOME ADDITIONAL GOALS:

Protect the hen against specific diseases

There are 2 objectives of immunizing any poultry flock:

- 1) to reduce the level of clinical disease and to promote optimal performance,
- 2) to use certain vaccines in chicken flocks (i.e. Salmonella vaccines), can be useful to reduce disease in the poultry flock and may also have a positive impact on human health by reducing the risk of human infection through food consumption.

How Do Vaccines Work?

Poultry vaccines are attenuated viruses that stimulate an immune response to specific disease-causing agents. Depending on the vaccine, they can be administered in various ways which are discussed in this reference guide.

Depending on the type of antigen in the vaccine, the bird's immune system will react, creating a "memory" response of antibodies and immune cells. **The more a bird is exposed to the same antigen, the greater the antibody response and resulting protection.** This is the reason why many flocks are vaccinated multiple times for the same disease – to maximize the immune system's response.

Vaccines and Vaccination

Vaccines for poultry come in three general forms: **Modified or Attenuated (Live), Inactivated (Killed), and Recombinants.** Live vaccines are strains that are naturally or genetically modified milder forms of field strains. Inactivated vaccines are whole viruses or bacteria that have been killed during production and formulated into a deliverable product. Recombinant vaccines, known also as vector vaccines, are made by using live viruses or bacteria as a vector to transport the gene coding for the protective antigen of a second infectious agent for which immunity is desired.

Table 1 COMPARISON OF LIVE AND INACTIVATED

Aspect of the Vaccine	Live	Inactivated
Safe	Yes	Yes
Economical	Yes	Expensive
Mass Application	Yes	No
Rapid Onset of Immunity	Yes	No
Duration of Immunity	Short	Long
Combination of Antigens Available	Yes	Yes
Maternal Antibody Interference	Yes	Low
In-Ovo Application	Some	No

Vaccine Handling and Storage

FOR ALL VACCINES:

- ✓ Vaccines should be transported with cool packs in a well-insulated box.
- ✓ If vaccines arrive hot, call distributor immediately.
- ✓ Storage temperatures should be 2 to 7°C (35 to 45°F).
- ✓ Avoid freezing, extreme heating and intense light.

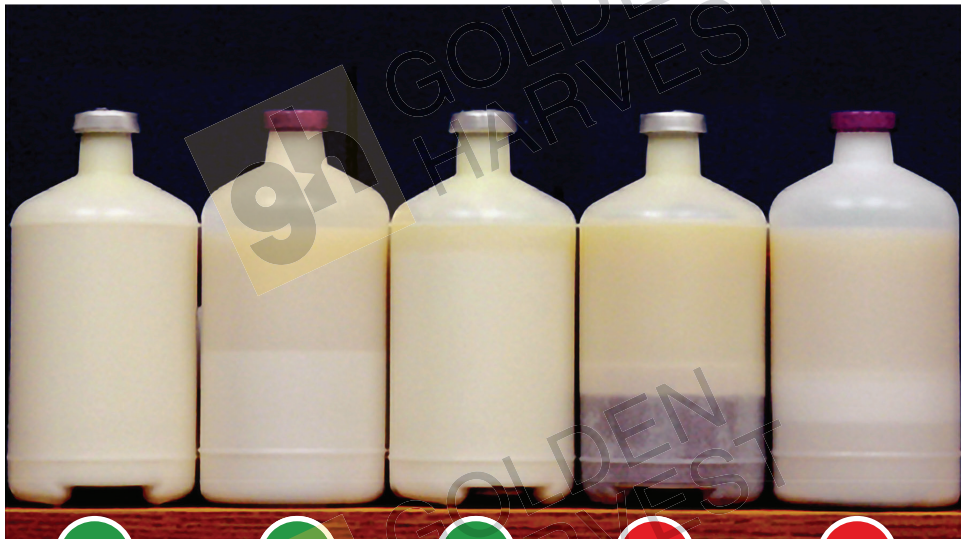
FOR LIVE VACCINES:

- ✓ Transport to farm in coolers with ice packs to keep temperature constant.
- ✓ Mix with diluent (reconstitute) just before application.
- ✓ Use vaccine within 2 hours after dilution for Infectious Bursal Disease (IBD) and Newcastle Disease (ND).

FOR INACTIVATED VACCINES:

- ✓ Always follow the manufacturer's instructions regarding preparation and delivery of any vaccine.
- ✓ Inactivated vaccines are especially susceptible to temperature extremes or poor handling. These products are generally in an oil emulsion and mishandling these products can result in disruption of the emulsion, known as a broken emulsion, which will waste this vaccine.
- ✓ Pre-warm oil emulsion vaccines at room temperature for 12 to 24 hours or using a warm water bath (do not exceed 37.7°C (100°F) for more than 5 hours). Pre-warming the vaccine reduces the viscosity of the mineral oil, making the administration easier and reducing any intense local reactions.
- ✓ Gently agitate bottles thoroughly prior to use. If the vaccine still has separate layers after agitating, test to see if the emulsion is broken, by shaking the bottle vigorously for 2 minutes. Let the bottle rest for 5 minutes. If separation persists, do not use that bottle of the vaccine and contact the manufacturer (See Picture 1).
- ✓ Do not leave bottles in direct sunlight during transport to farm.

PICTURE 1. VARYING PRESENTATIONS OF INACTIVATED VACCINES AND WHICH ARE SAFE TO USE:



1	2	3	4	5
Normal	Normal	Normal	Broken Emulsion	Broken Emulsion
Uniformly milky white	Significant settling has occurred	Slight settling has occurred	Bottom layer is black or dark brown	Plus, a thin layer of black or dark brown
	Vaccine has two layers	Vaccine has two layers	Vaccine has three layers	Vaccine has three layers
✓	✓	✓	✗	✗
Ok to use	Ok to use	Ok to use	<u>Do Not Use!</u>	<u>Do Not Use!</u>

HATCHERY VACCINATION

2

The hatcheries are a place where many chicks can be vaccinated conveniently and effectively. For this reason, an increased number of vaccinations are being given at this point.

Subcutaneous or intermuscular (IM) Injection at Day of Hatch

Day-old vaccination such as Avipro 105 ND CHICK is accomplished by giving 0.1ml of Avipro 105 ND CHICK vaccine subcutaneously under the skin at the back of the neck or intramuscularly in the leg.

The automatic vaccination machines used in many parts of the world generally are designed for neck injection. A skilled operator can vaccinate about 1600 to 2000 chicks per hour.

Needles should be changed several times during the day. Blunt, burred or bent needles must be replaced immediately.

AUTOMATED VACCINATOR CHECKLIST:

- ✓ Put on safety goggles and insulating gloves.
- ✓ Calibrate all vaccinators before vaccination for accuracy.
- ✓ Verify the position of the needles.
- ✓ Have an adequate supply of new sterile needles.
- ✓ Check all vaccinators for dose accuracy.
- ✓ Check the pneumatic pressure.
- ✓ Evaluate the hygiene status of the machine.
- ✓ Use a new needle with the bevel up towards the neck of the chick.
- ✓ Verify that the vaccine vials to be used have not been thawed. Many hatcheries invert the vaccine vials to leave the frozen product on top. If the vaccine is thawed inverted, the vaccine will flow to the cap of the vial and become visible.
- ✓ Verify that the vaccine diluent has the correct color (not yellow, not purple) and that it is not cloudy or has any kind of sediment or foreign particles.

VACCINE ADMINISTRATION:

- ✓ Begin the vaccination process with properly sanitized equipment.
- ✓ Test the system before chicks are vaccinated.
- ✓ The amount of vaccine delivered is usually 0.1ml (Avipro 105 ND Chick).
- ✓ Needles must be replaced with new needles every 1000 chicks or less.
- ✓ Once reconstituted, the vaccine should be used completely within 30 to 45 minutes. Should the vaccination staff need to stop or interrupt the procedure at any time, document the interruption.
- ✓ Determine any percentage of chicks with visible blood, which would be an indication of the needles being mal-positioned, burred or blunt, or of too much pressure being applied.



VACCINE ADMINISTRATION (CONT.):

- ✓ Verify that the machine remains properly calibrated and consistently delivers the prescribed volume of vaccine.
- ✓ Verify that the prescribed air pressure is correct (most machines operate with 75 PSI, or 5.2 Bars). Excess pressure will hurt the chicks and may promote leakage of vaccine or break down the cells in the vaccine. Insufficient air pressure may result in reduced doses of vaccine.

POST VACCINATION

- ✓ Ensure proper cleaning, sanitation, sterilization and maintenance of the vaccination equipment at the end of the day.
- ✓ Discard all unused vaccine, including vaccine left over from personnel breaks and any excess vaccine remaining after the completion of the hatch day.



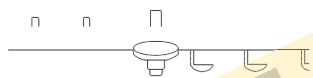
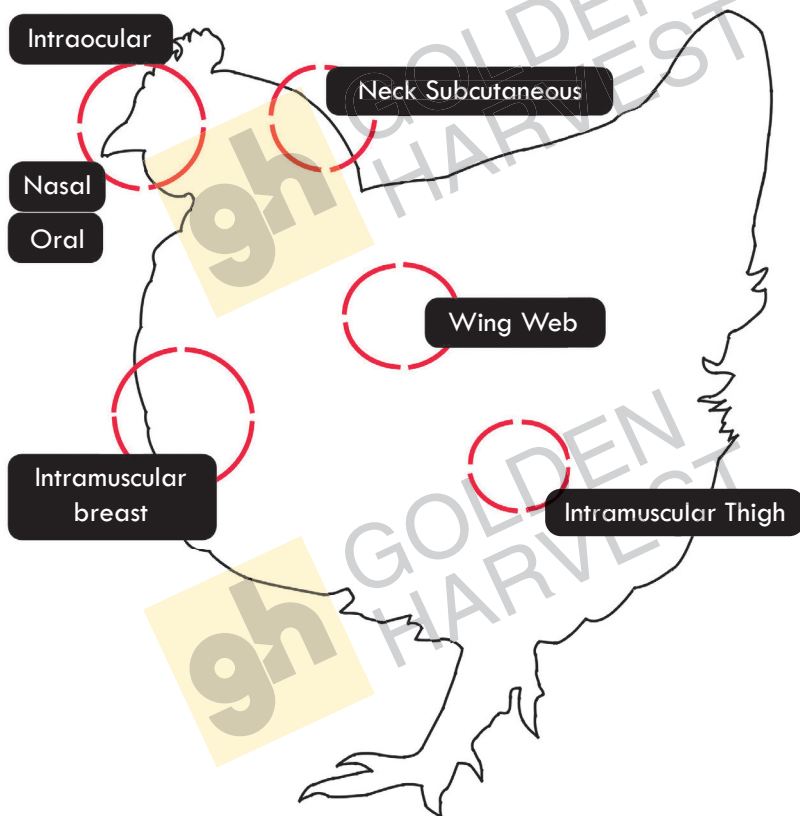
Spray Vaccination in the Hatchery

In many areas, chicks are vaccinated with live vaccines using a spray cabinet that administers a defined amount of water-based vaccine to each box of chicks. The droplet size is carefully controlled, and vaccination can be visualized on the chicks as moisture. This method is typically used for respiratory vaccines (IBV, NDV).

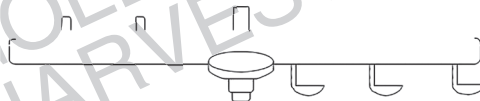
IMPORTANT POINTS FOR SPRAYING RESPIRATORY VACCINES IN THE HATCHERY:

- ✓ The water volume will change in respect to the vaccine type and spray equipment used.
- ✓ Run an empty chick box through the spray cabinet to check for uniform spraying side to side and end to end.
- ✓ A particle size of **100 to 300 microns** in diameter **is ideal** for spray vaccination in the hatchery. Smaller droplets will move with air currents and will not settle evenly over the chicks.
- ✓ The water used for vaccine reconstitution should be fresh, cool distilled water. Warm water may have a negative impact on vaccine viability and cold water will chill the chicks. Water should be no cooler than 16°C (60°F) and no warmer than 27°C (80°F).
- ✓ Items to monitor include the air pressure, nozzle spray pattern, volume delivered per nozzle in every actuation, orientation of the nozzles, belt speed, and height of the chick box.

Sites of vaccinations on a chicken



Spray



Through Water Line

FIELD VACCINATION

3

There are various ways to mass apply vaccinations to poultry in production housing situations. In some cases, the emphasis is on effective application with the lowest labor costs. In areas where labor is inexpensive and readily available, application strategies that maximize the immune response can be selected. Disease challenges in the production area will also play an important part in choosing the type of vaccine application best suited for that area.

The techniques to deliver vaccines can be used across all types of poultry production. Accommodations are needed for the type of housing (floor, slats, cages), water systems (open, closed, hand), equipment available (backpack sprayer, handheld sprayer, etc.) and age of the birds.

Spray Vaccination with Backpack Sprayer System

Backpack sprayers have become a popular method to mass administer live respiratory vaccines, especially to broilers. Several manufacturers are available, and modifications can be made to agricultural sprayers to accomplish this technique as well. Follow the manufacturer's instructions for the equipment used. Handheld sprayers are also available for smaller housing situations.

STAFF FOR VACCINATION

- ✓ Always use at least two people to vaccinate. Broilers may require up to three people for proper vaccination. A designated vaccination crew is preferred.
- ✓ The flock service technician should be present for guidance if possible when a flock is vaccinated.

EQUIPMENT

- ✓ Three backpack sprayers (one sprayer for each side of the house and a third to go through the middle).
- ✓ Vaccine storage - Insulated cooler with ice or cold packs.
- ✓ Distilled water for mixing.
- ✓ Gloves, mask and safety glasses.

BEFORE VACCINATION

- ✓ Spray 3.8 liters (1 gallon) of rinse water through the backpack sprayer.
- ✓ Observe spray particle size and pattern. The particle size for young chicks should be 80 to 120 microns and for older birds, between 60 to 80 microns.
- ✓ The sprayer must be used for vaccination only (never for pesticides, herbicides, or disinfectants).
- ✓ Wear gloves, mask and safety glasses during preparation and vaccine administration.

VACCINE MIXING

- ✓ Mix the vaccine on the farm, just prior to vaccinating each house. **Avipro ND Lasota, Avipro ND Visota, Avipro ND/IB Sohol, Avipro Precise, Avipro IBD Xtreme, Avipro Thymovac, Avipro AE, Avipro Salmonella Vac E.**
- ✓ Use clean, non-chlorinated water or water that has had vaccine stabilizer Aviblue or Blue C added. Distilled water is ideal. **Water should be no cooler than 16°C (60°F) and no warmer than 27°C (80°F).** Error should be towards the cool side as water too warm can damage the vaccine.
- ✓ Pour enough water into the sprayer tanks to allow the vaccination team to walk the length of the house twice SLOWLY without running out of vaccine. **(Minimum 1.25 liters per 10m, or 1 gallon per 100 feet).**
- ✓ Dissolve the vaccine in the vaccine bottle using distilled water, and then add the vaccine to the water in the sprayer tank. **Rinse the vaccine bottle thoroughly, otherwise up to 15% of the vaccine may be lost.**
- ✓ Shake the tanks on the sprayer to allow the vaccine to be mixed thoroughly.
- ✓ **IMPORTANT:** mix only the needed quantity of vaccine to vaccinate one house.
- ✓ For quality control records, note the serial number, expiry date for the vaccine used, the date and time of vaccination, the location (farm and house number), and the names of the staff members involved in the vaccination process.

HOUSE PREPARATION

- ✓ Minimize ventilation if possible.
- ✓ Dim the lights as low as possible to keep the birds calm during vaccination.
- ✓ Raise brooders (if possible).
- ✓ During hot weather, vaccinate very early in the morning.

VACCINE ADMINISTRATION

- ✓ Walk slowly. Start at one end of the house and make two complete passes through the house.
- ✓ One person should walk ahead of the vaccinators to part the birds and to keep the birds from piling against the back wall.
- ✓ Each vaccinator sprays one side of the house.
- ✓ Direct the nozzle 1 m (3.3 feet) above the birds' heads.
- ✓ Keep a constant pressure of 65 to 75 PSI (4.5 to 5.2 Bars).





POST VACCINATION

- ✓ Properly dispose of all empty vaccine vials, water jugs, etc.
- ✓ After vaccination is completed be sure to restore proper ventilation by setting fans to previous settings.
- ✓ Restore lighting to previous intensity.

SPRAYER MAINTENANCE

- ✓ Fully charge batteries prior to use.
- ✓ Change batteries after spraying 114 liters (30 gallons) of liquid or when the sprayer has been sitting unused for an extended time.
- ✓ Thoroughly rinse the tank with 3.8 liters (1 gallon) of distilled water at the end of each day or if changing vaccines.
- ✓ Remove and clean or replace the filter as needed.
- ✓ Clean the outside of the sprayer using a damp cloth and a mild detergent.
- ✓ Rinse the tank and pump thoroughly by spraying distilled water through the sprayer after using a bleach solution. Use a final rinse of isopropyl alcohol and spray before emptying and storing.
- ✓ Store the sprayer upside down in an area where it will not be exposed to temperature extremes.
- ✓ Periodically check all hoses and connections for signs of wear. Replace as needed.

Water Vaccination

Utilizing the drinking water systems in poultry housing is an easy and a common method to administer live vaccines. Birds must be water restricted for approximately one to two hours to ensure all birds are ready to drink once the vaccine is administered.

Water consumption is an important variable to calculate so that the correct amount of water can be used to mix with the vaccine. For houses with water meters, the consumption rate is easily obtained. Without a water meter, the information in Table 2 shows water consumption for broilers at different ages (estimation provided by Dr. Tom Tabler, Mississippi State University Extension Service Department).

When medicators are available in the house, a practice run using only water two days before vaccination will verify the amount of water needed. When using a water pump, it is assumed that the amount of water to be used for vaccination should be approximately 30% of the daily intake.

WATER CONSUMPTION/1 000 BIRDS/DAY

Broiler Age (Days)	Minimum Usage		Maximum Usage		Average Usage	
	gallons	liters	gallons	liters	gallons	liters
7	13.3	50	19.4	73	16.0	61
14	28.4	108	37.9	143	32.8	124
21	38.7	146	56.1	212	46.2	175
28	49.1	186	71.7	271	60.0	227
35	59.1	224	85.5	324	72.6	275
42	66.2	251	96.4	365	82.3	312
49	67.2	254	97.7	370	85.9	325
54	76.5	290	98.8	374	87.5	331



BEFORE VACCINATION

- ✓ Always administer the oral vaccine in the morning before the birds are fed (for pullets on feed schedules).
- ✓ All medication, disinfectants and chlorine must be removed from the drinking water 48 hours before vaccination.
- ✓ Water withdrawal prior to vaccine administration:
 - 30 to 60 minutes in hot climates
 - 60 to 90 minutes in cool climates
- ✓ Always administer the vaccine in the water early in the morning.
- ✓ Enough drinker space is required to allow free access to the vaccine solution.

VACCINE PREPARATION

- ✓ The use of a vaccine stabilizer **Aviblue** or skim milk powder to the water 20 to 30 minutes prior to adding the vaccine is recommended as a stabilizer. Add the skim milk powder at a ratio of 500 g / 200 L (1lb / 50 gal).
- ✓ Open the vaccine vial by removing the aluminum seal and the rubber stopper. With water that will be used in the vaccination, fill the vial approximately 2/3 full. Close the vial with the rubber stopper and gently agitate in order to reconstitute the lyophilized vaccine. Rinse the vaccine vials several times to remove all the vaccine.
- ✓ Use a graduated plastic bucket or prepare the vaccine directly in the water tank.
- ✓ If using a proportioner, calculate the average water consumption from the

last 4 days, in order to obtain the amount of water used by the proportioner. Calculate 30% of the volume of water used by the proportioner to prepare the vaccine in the bucket.

- ✓ Following the manufacturer's directions, add the vaccine stabilizer to the tank. Then, add the stock solution that contains the dissolved vaccine. When the vaccine is administered with a proportioner, also add a dye. Stir and mix using a plastic stick or other clean utensil.

VACCINE ADMINISTRATION

- ✓ Pour the reconstituted vaccine into the drinkers or open the valve of the water tank or the proportioner. For water tank and water pump specific information on priming and distribution see following sections (page 26 and page 27 respectively).
- ✓ Walk through the house to check if the birds are all drinking water. If using hand drinkers, redistribute drinkers if necessary.
- ✓ Note that the birds must drink all the vaccine solution within two hours, but not less than 1 hour.

POST VACCINATION

- ✓ Record all vaccine information and any problems that may have occurred with the birds or the vaccination process. This information may be important for the evaluation of the results.
- ✓ All medication, disinfectants and chlorine must be suspended from the drinking water until 24 hours after vaccination.



Using Water Tanks

BEFORE VACCINATION

- ✓ 48 hours prior to vaccination, close the water chlorinating system and remove the chlorine tablets from the proportioner. Water tanks must be clean and free of biofilm.
- ✓ Determine the number of birds that drink water from a water tank in the house and calculate the number of vaccine vials to be used in the water tank.
- ✓ The volume of clean water to be used for vaccination will be approximately 30% of the average daily volume of water consumed.

VACCINE MIXING

- ✓ Following the manufacturer's instructions, first mix the vaccine stabilizer into the water. Water should be no cooler than 16°C (60°F) and no warmer than 27°C (80°F).
- ✓ Add the vaccine vials and blue dye according to the calculation.

VACCINE ADMINISTRATION

- ✓ Open the water tank valve to allow the birds to consume the vaccine.
- ✓ After the vaccine is consumed, open the water flow normally.



Using a Pump System

A water pump can be used to drive the vaccine into the water lines. Water pump vaccination requires a closed water system (nipple drinker lines).

BEFORE VACCINATION

- ✓ Flush the drinker lines with fresh water to eliminate unwanted residues.
- ✓ Raise the drinking lines to prevent the birds from drinking 1 to 2 hours prior to vaccination.

VACCINE MIXING

- ✓ Calculate the amount of water needed so the vaccine is consumed in 80 to 90 minutes. This amount should be approximately 30% of the daily water intake. If the water restriction period was excessive, the birds will be thirsty and consume the vaccine too quickly. In this case, every bird may not have the opportunity to receive a dose of vaccine.
- ✓ Mix vaccine into a container or containers large enough to hold the required volume of mixed vaccine. The set up typically allows for fittings that enable the containers to be connected to the drinker lines.

VACCINE ADMINISTRATION

- ✓ Once the vaccine, vaccine stabilizer Aviblue or Blue C are mixed in the large container, the vaccine is pumped into the drinker lines with the assistance of a water pump.
- ✓ The end of the drinker line is open to improve flow.
- ✓ One staff member must observe the water coming out of the end of the drinker lines until the blue solution (the vaccine) is visible. When the color of Blue C or Aviblue is seen, close the end of the drinker lines.
- ✓ Lower the drinker lines to allow the chickens to consume the vaccine.
- ✓ Alternate the drums of mixed vaccine until all the vaccine doses are consumed.
- ✓ Walk through the house at least 2 to 3 times while the vaccine is being consumed in order to stimulate consumption by all birds in the house.

Intraocular (Eye Drop) or Nasal Drop Vaccination

VACCINE MIXING

- ✓ Confirm that the vaccine to be administered by eye drop is approved and manufactured for eye drop application. Serious issues may occur if the wrong vaccines are dropped into the eye.
- ✓ Open the vaccine vial and the diluent bottle, removing the aluminum seals and the rubber stopper. At the time of vaccine reconstitution, **the diluent's temperature must be between 2 to 8° C (36 to 45° F).**
- ✓ Open the diluent bottle and, using a syringe, remove 3 ml of diluent and inject it into the lyophilized vaccine vial. Some vaccines come with a special adapter to mix diluent and vaccine – in this case, connect the adaptor on the diluent bottle to the vial of lyophilized vaccine.
- ✓ Rinse the vaccine vials several times with diluent in order to remove any residues.
- ✓ Slowly shake the diluent bottle with the already reconstituted vaccine, without shaking vigorously.
- ✓ Attach the dosing/eye drop nozzle onto the diluent bottle.



VACCINE ADMINISTRATION

- ✓ The vaccination will only be considered successful if the drop (0.03 ml) is placed into the opened eye or nasal cavity and absorbed. For this to occur, it is important to wait a few seconds after administering the drop, before releasing the bird.
- ✓ If the drop is not totally absorbed, a new drop should be administered.
- ✓ To prevent the contents of the vaccine vial from getting warm against the hands of the vaccinator, divide the contents of the reconstituted vaccine into two or three empty vials, and alternate their use while keeping the others in a cooler with ice or cool packs.

POST VACCINATION

- ✓ Check the number of doses used versus the number of birds vaccinated. Record all information regarding the vaccination as well as any problems that may occur with the birds or the vaccination process.

Wing Web Vaccination

- ✓ This method is commonly used for Avipro POX CEO.

VACCINE PREPARATION

- ✓ The preparation of this vaccine is similar to that of the eye drop vaccine. The vaccine is lyophilized and must be reconstituted in the same manner as other vaccines.
- ✓ Only use the specific diluent which comes packaged with the vaccine. Shake the vaccine vial carefully, turning the vial from one side to the other without tapping.

VACCINE ADMINISTRATION

- ✓ Administer the vaccine in the center of the wing web, using a two-pronged needle applicator or other wing web applicator (Grant inoculator or others).



Use a two-pronged needle applicator to administer vaccines to the wing web

VACCINE ADMINISTRATION

- ✓ Dip the two-pronged applicator into the diluted vaccine and pierce the web on the underside of the wing, avoiding feathers, blood vessels and bones.
- ✓ Change needles every 500 to 1,000 birds.
- ✓ If the wing vein is punctured during the application, immediately change the needle and repeat the vaccination.

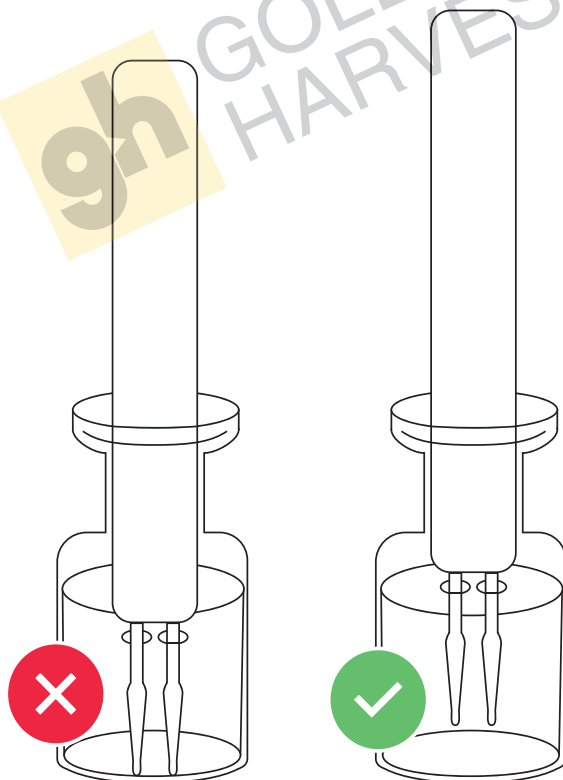
POST VACCINATION

- ✓ Used needles can be disinfected and used again if they remain sharp and have not been used on more than 1,000 birds.
- ✓ 7 to 10 days after vaccination, check for “vaccinal takes”. Check at least 50 birds per house. Please refer to Vaccination Quality Control section for examples (Part 4).



A small area of dye and no blood should be visible after vaccination

Wing Web Applicators



Take care not to dip wing web applicators too deep into vaccines. This wastes vaccines and dulls needles.

Injectable (Inactivated) Vaccines

Injectable vaccines must be manually injected into each bird using an 18 gauge needle that is 0.635cm (¼ in) in length. There are two major injection methods in avian species to allow suitable vaccination:

Intramuscular (IM)

Into the muscle

Subcutaneous (SC)

Under the skin

In order to utilize these methods, several sites are available for each type of injection – see Table 3. Research has shown that all common injection sites can give satisfactory results if done properly. When selecting the injection site, consideration should be given to ease of application, reaction at the injection site and human safety. Comparisons should be made to decide which injection site gives the best result in an individual operation.

CREW SAFETY

Accidental human injection with oil emulsion products poses a serious danger. If this occurs, immediate medical attention should be administered to the injured person. If these products are injected into the hands, fingers or body, they can alter circulation leading to severe injury. Immediate treatment will involve removing the oil emulsified product to improve healing in the affected area. This should be done by a qualified medical professional.

Proper injection technique and bird handling will prevent human injection. Bird handlers have an important responsibility to present the birds for injection at the proper angle for the chosen site of injection. If the syringe operator has to struggle to reach the site of injection, the chance for misapplication and accidental injection is much higher.

Table 3

Vaccination Injection Sites

Subcutaneous	Intramuscular
Neck	Breast
Inguinal Fold	Thigh
	Leg
	Wing
	Tail Head

INJECTABLE VACCINES BEFORE VACCINATION

- ✓ Gently agitate the vaccine container before and during the vaccination process to homogenize the contents.
- ✓ Pre-warm oil emulsion vaccines at room temperature for 12 to 24 hours or using a warm water bath (do not exceed 37.7°C (100°F) for more than 5 hours). Pre-warming the vaccine reduces the viscosity of the mineral oil, making the administration easier and reducing any intense local reactions.

VACCINE ADMINISTRATION

- ✓ Prime tubing and gun to avoid “dry” injection.
- ✓ Administer the vaccine by using only the labeled dose at the chosen site of injection.
- ✓ Needles should be replaced every 500 to 1,000 birds.
- ✓ Make sure that there is no air in the tube when the vaccine is administered.

POST VACCINATION

- ✓ Record vaccine information and any problems that may have occurred regarding the birds or the vaccination process.
- ✓ After vaccination, all needles, syringes and plastic tubes must be washed prior to sterilization and disinfection. Needles may be used again if they remain sharp and have not been used on more than 1,000 birds.
- ✓ Sterilize all equipment that was used in the vaccination, using an autoclave, alcohol or boiling water.

Instructions for Each Site of Administration

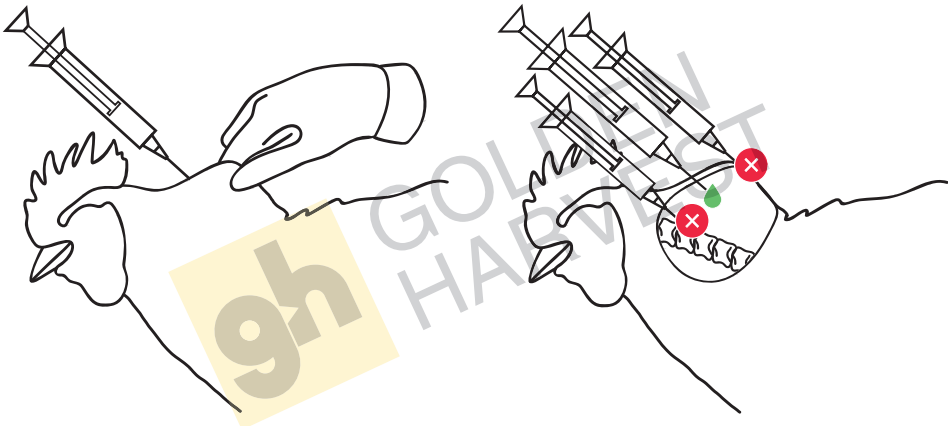
NECK

The skin on the back of the neck should be lifted to create a pocket between the skin and neck muscles. Insert the needle through the skin into this pocket with the needle pointing toward the bird’s body. The site of injection should be the middle to lower neck region on the dorsal mid line of the neck. There will be resistance as the needle passes through the skin followed by free movement

into the SC space. If this difference is not noticed or is followed by resistance again, the needle may be in the skin, the neck muscle or the spinal cord. Avoid injecting vaccine into the neck muscles, intradermally or too close to the head. Once the needle is in the SC space, a full dose of vaccine is injected before retraction. Early retraction of the needle will result in birds receiving a partial dose.



Neck Vaccination



BREAST

Vaccine is injected into the superficial pectoral muscle about 3 to 5 cm (1 to 1.5 in) lateral to the keel bone, depending on the age of the bird. The needle should be directed caudally at a 45° angle to the body. This will help avoid injecting the vaccine through the muscle and into the body cavity.



LEG

When using the leg muscle for vaccination, the injection should be made in the lateral side of the gastrocnemius muscle mid-way between the stifle joint and the body. The needle should be directed towards the head (proximally). Avoid major vessels, nerves, joints and the bone.

WING MUSCLE

The wing muscle (medial side of the biceps) can be used as an alternative IM site. The injection should be made into the large muscle group on the underside of the wing with the needle pointed toward the body. Avoid major vessels and bone.

VACCINATION QUALITY CONTROL

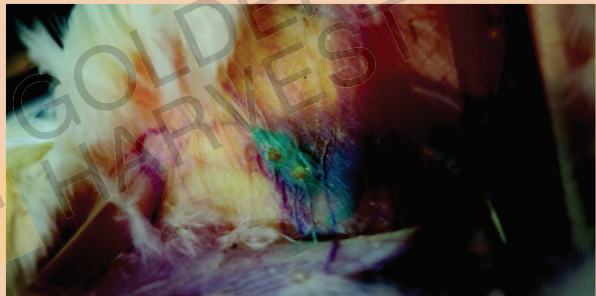
4

The best vaccination program can only be achieved with proper administration and monitoring to ensure the population is well protected. Within poultry flocks, several quality control strategies can be implemented to maximize vaccine administration.



Vaccinated pullet.

1. Vaccination crews should be randomly inspected by the veterinarian to examine their application techniques – for all administration methods. This is especially important for more valuable birds such as breeder pullets, where injection errors can impact future growth and egg production.
2. Designate one crew member for quality control to evaluate 50 to 100 birds during the vaccination sessions for wet feathers, hemorrhages, or other signs of improper application of vaccines.
3. Necropsy of cull birds or mis-sexed birds can allow immediate evaluation of vaccination techniques of injectable vaccines.



An acceptable vaccine reaction showing the presence of the two nodules following Fowl Pox vaccination via wing web.

4. Vaccine use must be carefully recorded throughout the vaccination procedures – number of doses used, vaccine lot and serial numbers, and number of birds vaccinated. Comparing the doses of birds vaccinated will allow for easy determination of dosage errors or missed birds.
5. Dyes can be added to both live and killed vaccines to visualize the vaccine at the time of administration by the vaccinator or immediately after vaccination for quality control checks in these areas:
 - a. *On the tongue or in the crop following water administration*
 - b. *Mouth and tongue following eye drop*
 - c. *Under the skin after SC injection*
6. Another method for verifying the quality of intraocular vaccination is to use a paper lining on the litter where the birds are released. If the drop ‘rolls off’ the eye, it will fall onto the paper, which will then be stained by the dyed diluent. If this happens, the vaccination is incomplete, leading to inconsistent titers and susceptibility to disease challenges.
7. For wing web vaccination, “takes” can be observed 7 to 10 days following administration. Select and examine 50 to 100 birds chosen randomly throughout the house.
8. Use a table similar to the example below to record your observations from the vaccination.

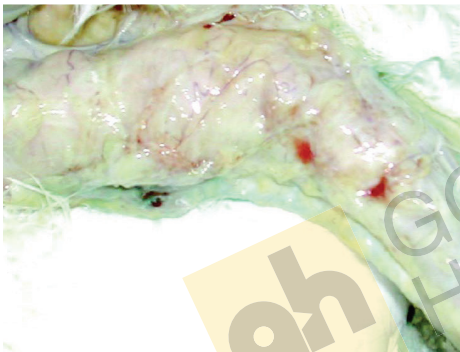
Table 4
Wing-Web Vaccine Efficacy Assessment

	House 1	House 2	House 3
Good: Presence of two nodules			
Medium: Presence of one nodule			
Poor: Absence of nodules			
Total Birds in the House, Total Birds Checked			
% of Good			
% of Medium			
% of Poor			

Mistakes When Using Injectable Vaccines

SC neck injection is a safe method of vaccination; however, improper technique can cause harm to the birds. The following misapplications can have serious consequences:

1. Vaccine is placed into the skin layer (intra-dermal). The area will develop into a hard lump and/or scab that may rupture, which birds will peck at causing bleeding and possible mortality. This will provide poor immunity.
2. Vaccine is injected into the neck muscle (intramuscular). The muscles of the neck are very small and the immune reaction to the vaccine creates inflammation and pressure. The damaged muscle heals by forming scar tissue. This scar tissue can lead to birds with twisted necks, resulting in poor performance.
3. Vaccine is injected into the bone or spinal cord. If the needle is inserted too deeply, it will pass through the neck muscles and vaccine can be injected into the spinal cord. Birds usually die within a few minutes after injection into the spine.
4. Vaccine is injected too close to the head. This can cause swollen heads which can impair feed consumption and vision. Injecting too low results in swelling over the back. Flock mates may peck at these noticeable swellings causing further issues.



Neck muscles of breeder pullet with improperly injected vaccine swelling the muscles



Bird with swollen head following SC injections that were too high on the neck

5. Vaccine is injected into the side of the neck (not on the mid-line of the neck). In this case, large vessels and soft tissue of the neck may be damaged. The needle can damage blood vessels causing SC bleeding. The thymus gland lies below the skin on both sides of the neck. Vaccine injected into the thymus leads to swelling with an eventual necrosis of the surrounding tissue.



deeply into the neck muscle

6. Vaccine is injected through the side of the neck. If the needle passes through both layers of skin, the vaccine will likely be deposited outside the bird and will wet the feathers on the opposite side of the neck. The bird will not develop a proper immune (good) response.



Dyed vaccine showing excessive coloration of feathers – bird potentially received only a partial dose or no vaccination



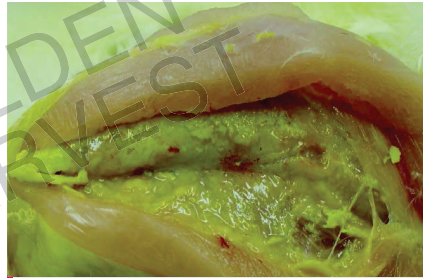
Large mass in area of thymus – birds were injected off mid-line



Subcutaneous bleeding from puncture of the blood vessels

INTRAMUSCULAR (IM) BREAST INJECTION

Intramuscular (IM) breast injection is an easier technique with increased accuracy but can have problems. Adverse lesions, in the form of granulomas, may remain in the muscle and be found at spent fowl processing. Vaccinators may insert the needle closer to the end of the breast, entering the abdomen or internal organs, resulting in the formation of abscesses in organs or adhesions to the abdominal wall. Certain injectable vaccines can create excessive reactions when injected into the muscle, leading to birds refusing feed for a few days. Carefully evaluate the products you plan to inject into the muscle – those containing inactivated bacteria tend to be more reactive in this manner.



Reaction within the breast muscle to Pasteurella bacterin injection

INTRAMUSCULAR (IM) LEG, THIGH OR WING INJECTION

Intramuscular leg, thigh or wing can also be utilized as sites of administration. The wing is a very small target and misapplication can easily occur. The leg is often selected as the site of injection for cage-reared layer pullets as the leg can be easily accessed with minimal stress to the



Excessive reaction to injection in the leg

pullets. When vaccinating in the leg or thigh, post-vaccination stress should be minimized since moving the pullets may exacerbate the vaccine reaction and cause leg swelling. The use of a concentrated vaccine (0.25 ml per dose) will also minimize the reaction when injecting into small muscle locations.

Monitoring the Vaccination Program

The objectives of using inactivated products include longer duration of immunity in long-lived birds and hyper-stimulation of antibodies to improve passive transfer of maternal antibodies to progeny. Therefore, the production of immunity in the hen and progeny may be directly impacted by vaccination quality.

The most common serological test used to monitor flock immunity and the success of the vaccination program is ELISA (Enzyme Linked Immuno Sorbent Assay). A variety of kits are available for numerous antigens through several commercial companies. The results are also quantitative for most antigens – giving Mean Titers, Geometric Mean Titers (GMT) and Coefficient of Variation (%CV) in the results. The desire in breeder hens is to achieve high GMT's and low %CV for the common antigens - IBDV, NDV, IBV and Reovirus. Reference: www.biocheck.com; www.idexx.com

Poor vaccine administration can raise the %CV and lower GMT of flocks sampled. This may be explained by higher numbers of non-vaccinated birds, vaccine leakage, poor quality or expired vaccine, or improper location of injection. The duration of titer levels can also be impacted by improper vaccination as titers diminish quickly in birds that receive a partial dose of vaccine.

Other additional serological tests can be used to evaluate vaccine administration – virus neutralization (VN) will show the level of neutralizing or protective antibodies. Hemagglutination inhibition (HI) can be used for ND, paramyxovirus - type 3, avian influenza, and *Mycoplasma gallisepticum*.

Table 5 gives examples of common antigens tested several weeks after vaccination with a specific ELISA kit. These are typical ranges – the normal values for your specific operation and vaccine program should be obtained through routine monitoring.

Table 5

Indications of Titers to Expect with IDEXX ELISA Kits

Test	Type	Mean ELISA Titer	Weeks Post-Vaccination	Mean ELISA Titer of Day-Old-Chicks
AEV	Live	3,000-4,000	5 - 8	-
IBV	Live	1,000-4,000	3 - 5	-
	Inactivated	5,000-6,000	5 - 8	2,000-6,000
IBD	Live	1,000-4,000	3 - 5	-
	Inactivated	4,000-15,000	5 - 8	3,000 - 7,000
NDV	Live	1,000-4,000	3 - 5	-
	Inactivated	10,000-32,000	5 - 8	5,000-10,000
REO	Live	2,000-4,000	3 - 5	-

IDEXX Ten Principles of Serology Interpretation

- ✓ Use rapid, convenient, sensitive, specific, and economic serological methods.
- ✓ Create and organize an in-house database.
- ✓ Compare your database against your own region.
- ✓ Consider seasonal changes in serological data.
- ✓ Know the power and limitations of each laboratory assay.
- ✓ Avoid risky single time-point evaluations.
- ✓ Comply with state, federal, and official regulations, especially when exporting hatching eggs or day-old poultry from vaccinated flocks.
- ✓ Consider pathogen strains, variants, or serotypes circulating locally.
- ✓ Know your field situation and disease epidemiology when interpreting serology.
- ✓ Know how and when to interpret serology qualitatively and quantitatively.

Abbreviations

HVT - Herpes Virus of Turkeys

rHVT - Recombinant Herpes Virus of Turkeys

NDV - Newcastle Disease Virus

IBD - Infectious Bursal Disease

IBDV - Infectious Bursal Disease Virus

SC - Subcutaneous

IM - Intramuscular

ELISA - Enzyme Linked Immunosorbent Assay

GMT - Geometric Mean Titers

CV - Coefficient of Variation

VN - Virus Neutralization

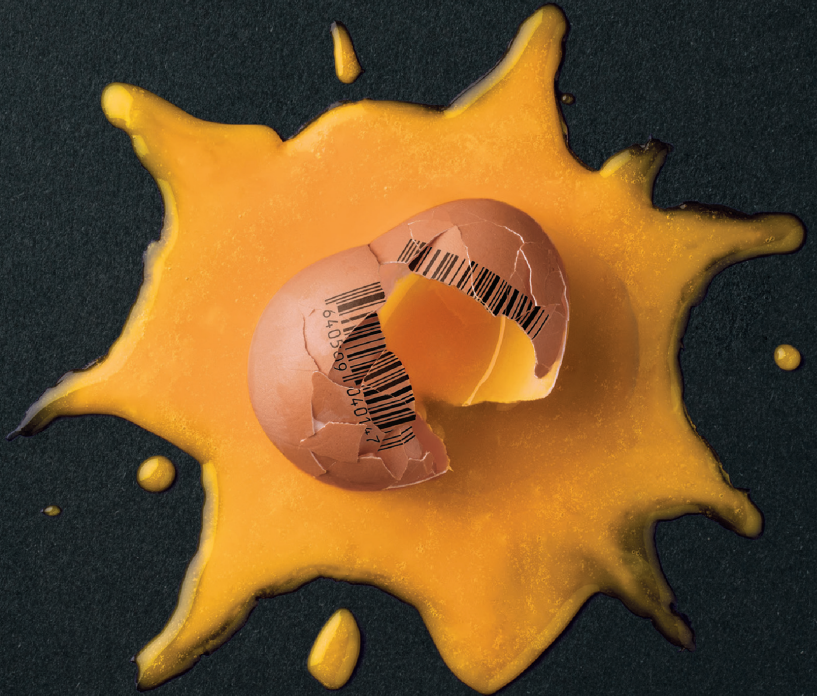
HI - Hemmagglutinin Inhibition

AEV - Avian Encephalomyelitis Virus

REO - Reovirus



**EGG
PROTECTION
IS IN
THE DETAILS**



AviPro®

Salmonella DUO

**Elanco****AviPro**

OUR SALMONELLA RANGE

AviPro® Salmonella DUO

Description: AviPro Salmonella Duo is

the first & only live vaccine

to have both Salmonella strains (Salmonella Enteritidis and Salmonella Typhimurium) in the same vial. One dose contains live attenuated:

- Salmonella Enteritidis bacteria, strain Sm24/Rif12/Ssq, min. 1×10^8 CFU and max. 6×10^8 CFU
- Salmonella Typhimurium bacteria, strain Na12/Rif9/Rtt, min. 1×10^8 CFU and max. 6×10^8 CFU

Indication: For active immunization of healthy and susceptible chickens to reduce faecal excretion and colonisation of internal organs with Salmonella Enteritidis and Salmonella Typhimurium field strains and to reduce colonisation of eggs with Salmonella Enteritidis field strains. Onset of immunity is 15 days and duration of immunity is for at least 68 weeks of life against virulent S. Enteritidis and 62 weeks of life against virulent S. Typhimurium.

Administration: A single dose at first day of life followed by a second vaccination at an age of 6 to 8 weeks and a third vaccination around the 16th week of life at least 3 weeks before onset of lay.

AviPro® Salmonella VAC E

Description: Attenuated Salmonella Enteritidis-bacteria, strain Sm24/Rif12/Ssq, at least 1×10^8 CFU. (CFU = colony forming units).

Indication: Active immunization of chickens to reduce the number of Salmonella Enteritidis field strains excreting birds. Immunity develops within 14 days of first vaccination: after 15 days the fecal excretion is reduced up to 70%. The immunity lasts until 52 weeks of life. **Administration:** Layers & breeders: a single dose at one day of age followed by a second vaccination at 6 to 8 weeks of age and a third vaccination at 16 to 18 weeks, at least 3 weeks before point of lay.

Administration: Drinking water.

AviPro® Salmonella 109 SE4

Description: Inactivated Salmonella Enteritidis vaccine, containing four different phage types of Salmonella Enteritidis (8, 14B, 23, 24), suspended in a stable water-in-oil emulsion.

Indications: For use in commercial layers and breeder hens to an aid in reduction of Salmonella Enteritidis colonization of internal organs, including the reproductive tract. Inject subcutaneously between 12 and 16 weeks of age. Revaccinate 4 weeks later. 0.25 ml dose size.

Pack Size: 500 ml



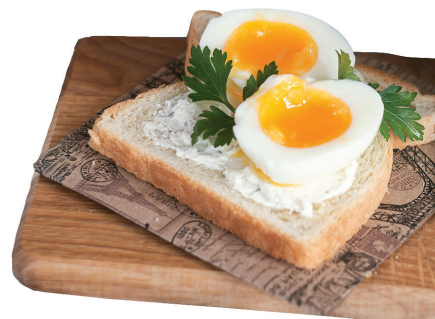
AviPro®
Salmonella
DUO



AviPro®
Salmonella
VAC E



AviPro®
Salmonella
109 SE4



Intercid®



Intercid

- Bactericide, Viricide, Fungicide
- High cleaning efficiency
- Non corrosive at ready-to-use application rates
- Non-staining
- Lower odour

Ideal for cleaning and disinfecting all types of **animal housing, cages** and surfaces within buildings e.g. walls, floors, equipment, appliances, transport boxes, vehicles, cages, kennels, quarantine areas, boots, tread mats and used in foot dips

Active Agents: 1 kg of the liquid Concentrat contains 140 g formaldehyde 100g Glutaraldehyde. Dilution Rate 1 : 400

Poultry: Marek's Disease, Newcastle Disease, Salmonellosis, Infectious Bronchitis, Pasteurellosis, Avian Coryza, Avian Rhinotracheitis, Avian Influenza, Infectious Bursal Diseases.

Cattle: FMD, IBR/IPV, BVD/MD, Bovine Influenza.

Small Animals: Parvovirus Infection, Feline Distemper (Panleucopenia), Feline Rhinotracheitis, Leucosis, Feline Infectious Peritonitis, Distemper, Rabies.

May be used on vehicles, machinery and equipment: not known to be corrosive at recommended dilutions.

Biodegradable: Glutaraldehyde is 90 - 100% biodegradable under OECD test conditions - OECD 301A.

Works at low temperatures: DEFRA tested at 4°C, at higher temperatures works faster and with lower concentrations.

Disinfects in presence of organic matter: DVG tested on absorbent surfaces and in presence of organic matter.

1. DEFRA UK Govt. Approvals:

- ✓ General Orders 2.50% 30 min
- ✓ Poultry Orders 1.00% 30 min
- ✓ Foot and Mouth 0.50% 30 min

2. DVG (German Veterinary Association) approved rates

Prophylactic disinfection against bacterial infections	0.50%	1hr
Special disinfection against bacterial infections	1.00%	2hr
Disinfection of encapsulated viruses	1.00%	1hr
Disinfection of non-encapsulated viruses	1.00%	2hr
Disinfection of fungi	1.00%	2hr
Disinfection Mycobacterium avium	5.00%	2hr

3. European approvals:

DIN/EN 1656	bacteria	0.5%	for 30 min.	DIN/EN 14675	viruses	1%	for 30 min
DIN/EN 14349	bacteria	1.0%	for 30 min.	DIN/EN 657	yeasts	0.5%	for 30 min

General Instructions:

Breathing protection:	Full face mask, filter AX-P2, or A2-B2-P2
Hand protection:	Protective rubber gloves e.g. Nitril
Eye protection:	Glasses with side protection, or Basket eye glasses



Use Biocides Safely.

Always read the label and product information before use!



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