
EXPERIMENT 8 VACCINATION OF BIRDS

Structure

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8.1 INTRODUCTION

It is rightly said no bird is healthy till all birds are healthy. It is well recognized that certain diseases are most likely to occur and each of these diseases can cause severe economic losses. Fortunately, vaccines are available for many diseases so that they can be prevented provided that they are administered as per specifications. Absence of disease obviously improves the productive performance of the birds as well. Therefore, preventive vaccination against different diseases is the most important part of health cover besides bio-security and medication.

Objectives

After performing this experiment, you will be able to:

- demonstrate vaccination of birds; and
- arrange disposal of left-over vaccine and vials.

8.2 EXPERIMENT

8.2.1 Principle

Vaccine is a suspension or preparation that is made up of microorganisms in live or dead form, which when administered to the body produces resistance or immunity against specific disease. The vaccines are of two types: Live and killed. Vaccination involves careful preservation, handling, reconstitution, application and disposal of left-over vaccines and vaccine vials.

8.2.2 Requirements

- Refrigerator, thermocole boxes, ice pack or ice etc., in case of live vaccines.
- Vaccinators with provision to adjust the dose.
- Sterilization equipments for disinfection of vaccinators, needles etc.
- Sterile syringes and needles.

8.2.3 Procedure

(A) Vaccine Storage

Vaccines are normally stored in the refrigerator at the temperature of 4 to 6°C, but for longer duration to say for one year of storage they can be kept at temperature of -15 to -20°C. Even during the transportation of the vaccine by the supplier, it must be kept in a thermocole box with ice packing. The temperature requirement for different vaccines is given in Table 8.1.

Table 8.1: Temperature Requirements for Different Vaccines for Poultry

Name of Product	Temperature		
	Transport	Storage	Reconstituted Vaccine
Live/Attenuated viral vaccine	On ice thermocole sealed box	For shorter duration below 6°C. For longer duration in deep freezer (-15°C to 20°C)	On ice in chilled condition.
Killed/Inactivated viral or bacterial vaccine	Room temperature (22-28°C) for short period but don't freeze	Between 10-20°C Don't freeze	Room temperature
Diluents for live viral vaccine	Room temperature	Room temperature	On ice in chilled condition. Chill the diluents before use

(B) Reconstitution of Vaccine

(i) Live Vaccine

- 1) Store the diluent bottles in the refrigerator overnight to chill before use.
- 2) Using sterile needle and syringe, withdraw approximately 5 ml of pre-chilled diluent and transfer it to vaccine vial.
- 3) Suspend the vaccine pellet by shaking vaccine vial slowly (avoid froth/bubble formation).
- 4) Using the same syringe, remove the diluted vaccine and transfer to the diluent bottle.
- 5) Rinse the vaccine vials twice with 5 ml of diluted vaccine, transfer the same to the diluent bottle.
- 6) Mix the final vaccine by gently inverting the diluent bottle several times.
- 7) During vaccination, shake the bottle of reconstituted vaccine frequently and keep it on ice.



Fig. 8.1: Cold Chain

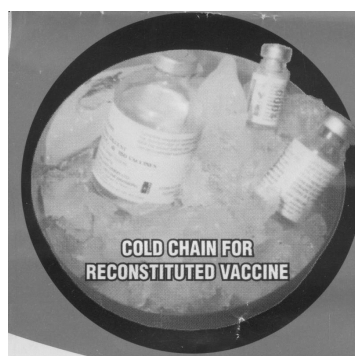


Fig. 8.2: Reconstituted Vaccine

Note: Utilize the reconstituted vaccine within two hours of reconstitution. Prepare only the required quantity just before use. Never store the left-over vaccine in the refrigerator.

(ii) Killed vaccine

- 1) Killed vaccines are in liquid form with adjuvant and need no reconstitution.
- 2) Remove the vaccine from refrigerator the day before it is to be used and allow it to attain room temperature.
- 3) Shake well before use during frequent syringe withdrawals.

(C) Common Routes of Vaccination

Different vaccines are administered into birds by different routes. Regardless of route of vaccination, batch number of the vaccine, date of manufacture, date of expiry and details of the supplier have to be carefully recorded. The common ones are discussed below:

(i) Intraocular (I/O)

It is generally preferred in chicks since they are easy to handle and a drop of the reconstituted vaccine is placed in the eye (conjunctiva).

- 1) Chicks during brooding are made to move to one end/corner of the brooding area.
- 2) Care has to be taken to constantly watch and keep the chicks evenly distributed to avoid huddling and dying due to suffocation.
- 3) Attendant should be careful not to crush chicks under his feet.
- 4) Chicks are taken one at a time, held in one hand and open one eye.
- 5) Take the vaccine in sterile dropper supplied with vaccine pack and put it in the chick's eye.
- 6) Manytimes, the diluent bottle itself can be used as a dropper (see Fig. 8.3 and 8.4).
- 7) Wait till vaccine drop is absorbed completely.



Fig. 8.3: Vaccination Drop Size

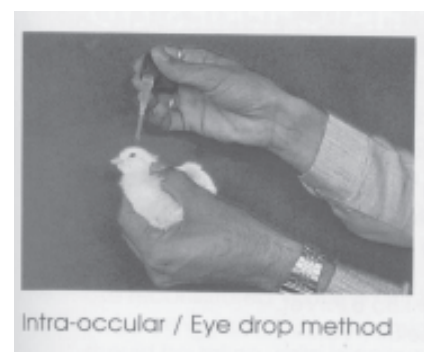


Fig. 8.4: Intra-ocular method

Note: Manytimes, the vaccine drop is expelled off the eye by the chick due to movement of the chick. So, care should be taken to see that the vaccine drop is completely absorbed by the chick.

(ii) Intranasal (I/N)

Procedure is same as in case of intra-ocular except that the vaccine is given into the nostril (Fig. 8.5).

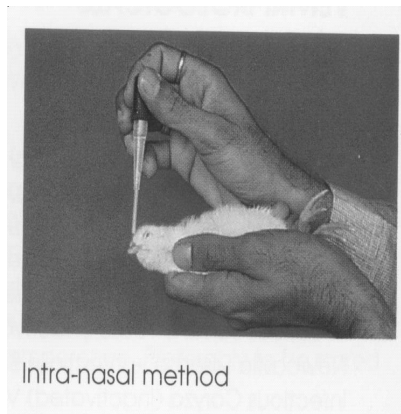


Fig. 8.5: Intra-nasal method

(iii) Drinking Water (D/W)

This is the most common route of vaccination on a large scale because there is no handling of individual birds. In this method, the vaccine is administered through drinking water.

- 1) Drinking water should not have any other chemical including chlorine because; such chemicals kill the vaccine itself.
- 2) Ensure that sufficient drinker space is provided; even 10 to 20% extra space can be allowed.
- 3) Birds easily identify vaccine mixed water and normally do not drink such water. Therefore, drinkers are removed four (summer conditions) to six (cool conditions) hours before administering the vaccine so that all birds will be thirsty and drink as soon as water is made available.
- 4) Generally, morning hours are preferred because the birds expect feed and water in the morning hours.
- 5) All drinkers must be washed with non-medicated clean water.
- 6) Ice cubes should be added to keep water cool so as to increase potency of the vaccine.
- 7) Dissolve skimmed milk powder @ 60 g/10 litres of water. This stabilizes the virus in vaccine and prevents the action of disinfectant, if any, present in water. Reconstituted vaccine should be initially mixed with a small quantity of skimmed milk powder and then with the water.
- 8) Keep the water intake for broilers at the rate of 35, 60, 120, 180, 230, 280, 320 ml per bird per day during the age of 1, 2, 3, 4, 5, 6 and 7 weeks, respectively. While for egg type chickens, use 15, 25, 45, 65, 80, 95, 105 and 120 ml water per bird per day during the age of 1, 2, 3, 4, 5, 6, 7 and 8 weeks, respectively.

Note: This method is useful for large population, causes less stress to the birds; but, does not give 100% protection and cannot be used for primary vaccination.

(iv) Subcutaneous (S/C)

“Subcutaneous” means below the skin. Hence, usually a syringe is required for the purpose. Since many birds have to be vaccinated at a time, it is neither practical (though may be ideal) nor economical in terms of time and cost to use separate disposable syringe to each of the birds. Hence, automatic syringe which dispenses the desired quantity of vaccine every time is used (Fig. 8.6 and 8.7).



Fig. 8.6: Automatic vaccinator syringe

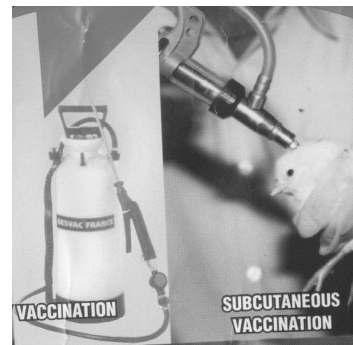


Fig. 8.7: Subcutaneous method

This method requires handling of birds individually.

(a) In case of day-old chicks

- 1) Give the vaccine in the neck region.
- 2) A 22 or 24 gauge needle is used.
- 3) Lift up the skin at the neck region and insert the needle just behind the head pointing towards the body.
- 4) Administer the vaccine of desired amount using sterile syringe and needle.

Note: Avoid injecting into neck muscles and close to head.

(b) In case of wing-web method

Although is a subcutaneous route, it is popularly referred to as “Wing web” method. A flap of skin with least blood circulation at the first joint in the wings underneath is called the “Wing web”. Vaccine is administered subcutaneously at this region. Generally, this route is used for R₂B vaccine which is a live vaccine and the virus if falls into the attendant’s eye can cause eye irritation.

- 1) Move the birds towards a corner by means of a mesh.
- 2) Carefully watch for crushing and suffocation of the birds by regularly disturbing the birds.
- 3) Hold each bird with its underside of the wing exposed while supporting its body on the hand holding it.
- 4) With the needle of the automatic vaccinator pierce the wing web just enough to reach underneath the skin and administer the vaccine.
- 5) If properly administered, a bubble-like swelling is noticed at the point of vaccination.
- 6) Remove the needle quickly from the wing followed by release of the bird.

Note : Care should be taken not to inject the vaccine into the tissue/muscle. Similarly, care is essential to avoid accidental spraying of vaccine into the eyes of the attendant holding the bird.

(v) Wing stab method

This method is practiced for administering Fowl Pox vaccine. The location where the vaccine is administered is similar to that of wing web vaccination. This method involves puncturing the wing web region with a twin-needle vaccinator dipped in the vaccine. The needles will have holes at their tip and a small quantity of the vaccine is carried in those holes. When punctured (stabbed) by the needles, the vaccine gets deposited.

(vi) Other methods

Many other methods like intramuscular, intra-peritoneal etc., were being used; but, now-a-days, they are replaced by the methods described above.

(C) Disposal of left-over vaccine, vials etc.

Left-over vaccine along with the vaccine vial and diluent container, disposable syringe used for reconstitution of the vaccine must be destroyed by burning.

8.2.4 Observations

- i) Record the batch number, date of manufacture and expiry, name and type of vaccine, number of doses, volume of diluent used and route of vaccination you have practiced.
- ii) Record the procedure, precautions (before, during and after vaccination) and routes of vaccinating birds.
- iii) Record the procedure you have adopted to dispose of vaccine vials, disposable syringes etc.

8.2.5 Results

Give your opinion on different methods of vaccination in poultry.

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8.3 PRECAUTIONS

- Buy a vaccine of a reputed manufacturer from reliable shop which has refrigeration facilities.
- The live vaccines should be transported on ice from the market to farm and stored in refrigerator. Diluents also should be stored properly.
- Don't use expired and premixed vaccines.
- Don't vaccinate during hot weather.
- Don't vaccinate sick or birds under stress because they may not respond to vaccine or may aggravate the disease.
- Don't use less than recommended dosage and vaccination should be carried out by skilled persons.
- Use sterile vaccinators. Don't use chemical disinfectants for sterilization of vaccinators.
- Follow the instructions of manufacturer of each vaccine.