

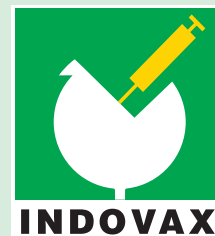
Do's & Don'ts of Vaccination

Do's

- ◆ Ensure proper storage of vaccine and diluent.
- ◆ Use vaccine within its shelf life.
- ◆ Chill the diluent before reconstitution.
- ◆ Reconstitute the vaccine as per the manufacturer's guidelines.
- ◆ Follow aseptic precautions during preparation vaccine and its administration.
- ◆ Use sterile syringes and needles for reconstitution and vaccination.
- ◆ Ensure full utilization of vaccine solution within 2 hours of its reconstitution.
- ◆ Dispose off the used vaccine containers in proper fashion.
- ◆ Vaccinates should be maintained under good management conditions and prevented from unnecessary exposure to stress conditions.
- ◆ Follow appropriate route of vaccination, depending upon the vaccine.

Don'ts

- ◆ Do not sacrifice accuracy for speed of the vaccination.
- ◆ Do not use any diluent other than the one supplied by the manufacturer for reconstitution of vaccine.
- ◆ Do not expose the vaccine to direct sunlight.
- ◆ Do not vaccinate sick birds and birds under stress.
- ◆ Do not use any disinfectant / sanitizer during reconstitution.
- ◆ Do not store the left over vaccine after reconstitution.
- ◆ Do not use chlorinated water for drinking water vaccination.
- ◆ Do not under dose or over dose the birds.
- ◆ Do not inject your own finger while vaccination. Consult a physician in case of accidental injection.



Committed to providing appropriate solution to poultry disease problems in tropics.

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VACCINES & VACCINE ADMINISTRATION TO POULTRY FLOCKS

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Biosecurity and vaccination are assuming a significant role in preventing diseases in poultry. World over, vaccination continues to be the most practical and effectively adopted measure for the prevention of diseases. However, vaccination is only one of the several available means of disease prevention and can be effective if adequate bio-security, sanitation and other good farm management practices are in place. Administration of vaccine plays as important a role as the vaccine itself.

Vaccines work best under conditions of bio-security. To ensure the effectiveness of a vaccine, not only should the vaccine be good, but it should be transported, and stored under optimum conditions. Equally important is its proper administration. Bio-security programs ensure good flock health and improve performance. Improper/ poor administration can lead to vaccine failure. Carefully planned administration of the vaccine will ensure effectiveness of the vaccine, thereby improving disease control and, as a result, the economic performance of the flocks.

What is a Vaccine?

Vaccine is preparation containing antigenic substances and is administered for the purpose of inducing a specific active immunity against a disease, caused by bacteria, toxins, viruses or parasites.

Types of vaccines

Poultry vaccines are of two types – live and inactivated. Both have their merits.

-Live attenuated vaccines

Live vaccines can be administered by eye drop, intranasal, drinking water, spray (aerosol), or through parenteral route as per the manufacturer's claim. The antigen may consist of organisms causing the disease that have been properly attenuated i.e. made less virulent by appropriate laboratory procedures. It may

be a naturally occurring mild strain of the organism in nature. In case of live vaccines a small amount of antigen is required because the live virus multiplies rapidly in the target organ(s) of susceptible birds. This organ could be the respiratory tract for viruses such as ND and IB, or the gut for AE and IBD viruses. Live vaccines stimulate the production of immunity which could either be local or general.

Since the average flock size is generally large, the most widely used vaccines are live attenuated virus vaccines that can be administered to birds by methods that are practical. This is usually done by means of drinking water though some live vaccines require individual application by eye drop or administration by injection.

-Inactivated vaccines

Inactivated or killed vaccines consist of concentrated antigen presented as water in oil emulsion or aluminium hydroxide adjuvant. The antigen contained in an adjuvant vaccine gives prolonged stimulus for antibody production.

Inactivated vaccines are generally for use in breeding or laying stock and require individual administration by injection.

Routes of Administration

- ◆ Eye Drop/ Intranasal
- ◆ Beak dipping
- ◆ Drinking water
- ◆ Spray/nebulization
(Birds in environment controlled housing)
- ◆ Wing Web
- ◆ Injection – Intramuscular or subcutaneous
- ◆ In-Ovo administration

Eye drop / Intranasal Administration

Of all the available methods of administration, the eye drop or intranasal route is probably the most effective means of administering live vaccines to birds.

Each bird is individually handled to ensure that it receives a full dose of vaccine. The process facilitates both local and humoral immunity due to the presence of the Harderian gland located behind the third eyelid.

Accuracy is important and care must be taken to ensure that the fluid does not "roll off" the eye/nostril. Vaccine given in the eye must disappear after a blink and vaccine given by intranasal route must enter the nostril before the bird is released. The whole process must not be rushed, else the birds will miss the vaccine by the intranasal route, it is desirable to block the other nostril to ensure intake of vaccine.

Beak Dipping

Some manufacturers recommend beak dipping for vaccination IB vaccine to be done at 1 day of age. Reconstitute 1000 dose vaccine vial in 1 ml of diluents. Add the reconstituted vaccine to 250 ml of distilled water. Dip the beak of the chick in the solution up to its nostril, so that the vaccine solution penetrates the nasal ducts.

On removal, chicks will shake their head, indicating vaccine take. Ensure that the reconstituted vaccine is used within 2 hours.

Drinking water Administration

Where the target organ is the gut, drinking water administration is an appropriate method of administration for most live vaccines such as Gumboro disease and Avian Encephalomyelitis vaccines. Drinking water administration is considered as a practical method of administration for most live vaccines and should be followed for booster vaccination only.

Live vaccines, particularly after their dilution, have a limited life span that must be taken into account while administering the vaccine. It is necessary to ensure full utilization of vaccine within 2 hours of its reconstitution.

One of the limitations of this method is that it's not sure

whether all birds in the flock will drink during the period the vaccine is made available to them. Various means are available to encourage this situation such as controlled lighting, controlled feeding or water deprivation. Water deprivation is useful. However, this must be used with caution as excessive deprivation can stress the birds to a level which can lead to drop in production or even predispose them to disease and adversely influence vaccine efficacy and feed efficiency.

In case water is withdrawn before administering the vaccine through drinking water, it must be ensured that the drinkers/waterers are adequate in number and definitely never short. Availability of less number of waterers / drinkers can lead to lower peck order, resulting in few birds not receiving the vaccine at all since thirsty birds may consume the entire water containing the vaccine.

Live vaccines are as sensitive to antiviral agents (disinfectants) as field viruses. Therefore, it is important to ensure that the vaccine does not come in contact with disinfectants, metallic ions, chlorinated water or water sanitizing materials commonly used on farms. It should be ensured that vaccine solution is not put into metal storage tanks. It is essential to ensure that entire drinking water system is clean and does not contain any debris such as rust and dirt and there are no residues of any sanitizer, which might inactivate the vaccine viruses. Chlorinated water is hazardous to vaccines and can severely reduce the amount of vaccine virus presented to the birds. Use clean, non chlorinated cool water.

The addition of skimmed milk powder to water which will come into contact with vaccine is a simple and effective way to overcome the detrimental effects of chlorine. Milk powder must be mixed at the rate of 2.5-3g per litre and at least 20 minutes before adding the vaccine to give time for neutralization of any damage causing components in the water such as chlorine or metallic ions. Once vaccine is presented to the birds, walk along the sides of the shed (in case of birds on litter) to stimulate bird movement, thereby encouraging drinking.

Administration by Spray

Another method of mass administration of live vaccines involves application by spray or aerosol. Generally an aerosol contains very fine and minute particles which can penetrate deep into the respiratory tract. This may initiate a severe vaccine reaction. Birds which are carriers of Mycoplasma or E. coli infection may break into clinical cases. Poultry stocks infected with Mycoplasma gallisepticum / E. coli are more susceptible to respiratory reactions following aerosol vaccination.

Thus a coarser spray with particles of greater size is generally preferable to an aerosol and is less likely to cause an adverse reaction.

The principal mode of action in aerosol method is inhalation and body contact. Chicks are sprayed with the vaccine water either in delivery boxes or closed poultry houses. The idea of soaking the chicks with vaccine water is that apart from inhaling the virus, it allows them to pick the vaccine from each other's body. This holds good for high humid conditions. In hot and dry Indian environment, the vaccine dries up quickly, leaving no scope for its physical lateral transfer.

Vaccine should be reconstituted with cool distilled water and not tap water, as the latter contains dissolved solids and salts which concentrate rapidly as spray droplets evaporate and this is harmful to the virus particles. **These conditions can inactivate the vaccine virus**, and therefore, it is advisable to add defatted dried milk or gelatin. The volume of water is determined by trial and error with each type of vaccine. In general 500 ml of distilled water per 10,000 – 15,000 doses is considered adequate.

Aerosol vaccination gives reliable immune response provide the poultry house is environmentally controlled. It consists of a house that is totally enclosed, humidity is controlled and where the ventilation is controlled by fans that can be switched off to provide still air conditions. In closed houses, fans should be turned off with inlets and outlets closed, the lights dimmed and the birds allowed to settle quietly before spraying commences.

Indian poultry growers do not practice these

conditions as birds are housed in open-sided houses. Therefore, looking to poultry farming practices in India, spray method of vaccination is not suitable at all.

Administration by Injection

Live vaccines may have to be administered by injection as in the case of Marek's, R2B and Reovirus vaccines. Injection is the most common route of administration for killed or inactivated vaccines. Automatic syringes are used to preset dosage. Injection may either be given subcutaneously in the back of the neck, or intramuscularly in the breast or leg muscles.

The method and care of handling birds during this procedure is also important as improper handling can contribute to granuloma formation, lameness or head swelling in birds.

A 19 gauge needle is suitable for use and should be changed at least every 200 birds in order to avoid spread of bacteria and viral contaminants. It is important that the equipment is regularly checked to ensure that the dosage is correct.

Wing Web Administration

Vaccination via wing web is the principal method of administration of Fowl pox vaccine, though Avian encephalomyelitis is often combined with Fowl pox Vaccine. The site most widely used for application is usually the skin of the wing web, using a two prong applicator. This provides twice the area inoculated and results in better protection. Care should be taken to avoid the vaccine coming into contact with the birds' eyes or mouth which can lead to lesions appearing in these organs.

Site of administration should be examined and if it appears slightly raised or swollen after 7-14 days of vaccination, it is an indication that the vaccine has been effectively administered.

In – Ovo Administration

This is a process by which the vaccine is administered in fertile eggs via the air cell around 18 days of age on transfer into the hatchers, using a special machine.

Essentially it is a hatchery operation which needs to be done where absolute ambient sterility can be maintained and calls for very large numbers to be handled at a given point in time.