Routs of Adminstration of Vaccines in Poultry

BY

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Vaccination plays a crucial role in the management of the health of your poultry flock. Vaccinations can prevent a number of poultry diseases. Vaccination is a process in which the healthy chickens are infected in a controlled way with a dead or weakened pathogen. After the vaccination, the birds' own immune system will respond to the vaccine by activating an army of cells designed to attack and destroy the invaders before they cause damage to the bird. After the attack, several specialized immune system cells remain, called memory cells. These memory cells will remember the infectious agent to which the bird is vaccinated. If later life an encounter with the infectious agent takes place, the birds' immune system is capable of a quick "detect and destroy" of the infectious agent, resulting in protection from the disease and therefore preserving the productive health of your flock

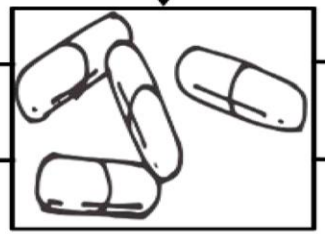
Vaccination in poultry

Prevent poultry from bacterial infections

Reduction of secondary infections

Reduction of disease transmission

Reduction of infections (caused by sensitive and/or resistant bacterial pathogens



Suppression of resistance evaluation

Use of more effective antibiotics

Reduction of antibiotic use

Reduction of AMR pathogens

Vaccine production

Vaccines are produced mainly in three forms:

**Liquid vaccine – it is in a fluid form ready to use.

**Freeze-dried vaccine – the vaccine is stored as one pack of freeze-dried material and one pack of diluent, often a sterile saline solution. These have to be combined before use.

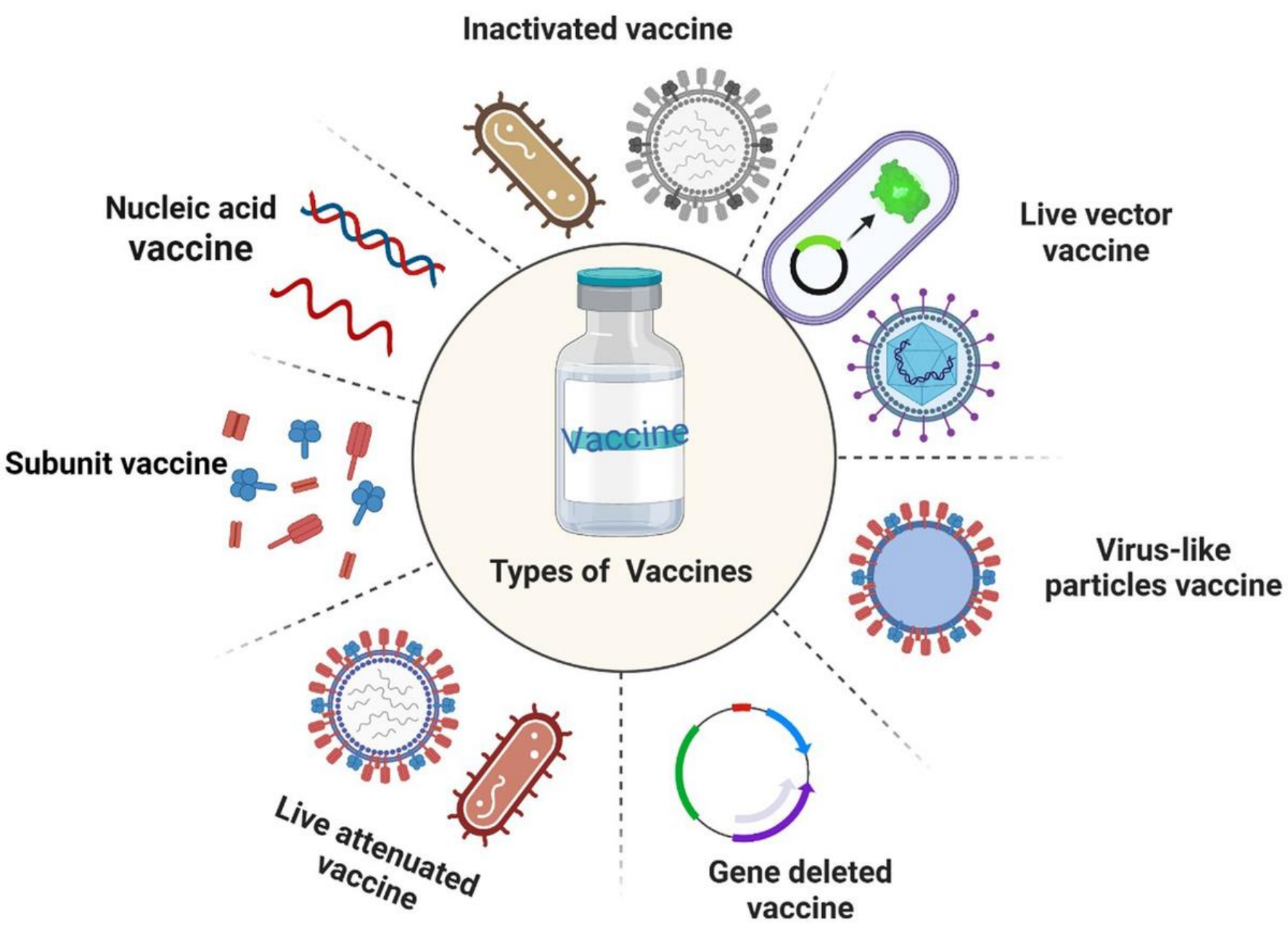
**Dust – where the vaccine is prepared for administration in the dry form.

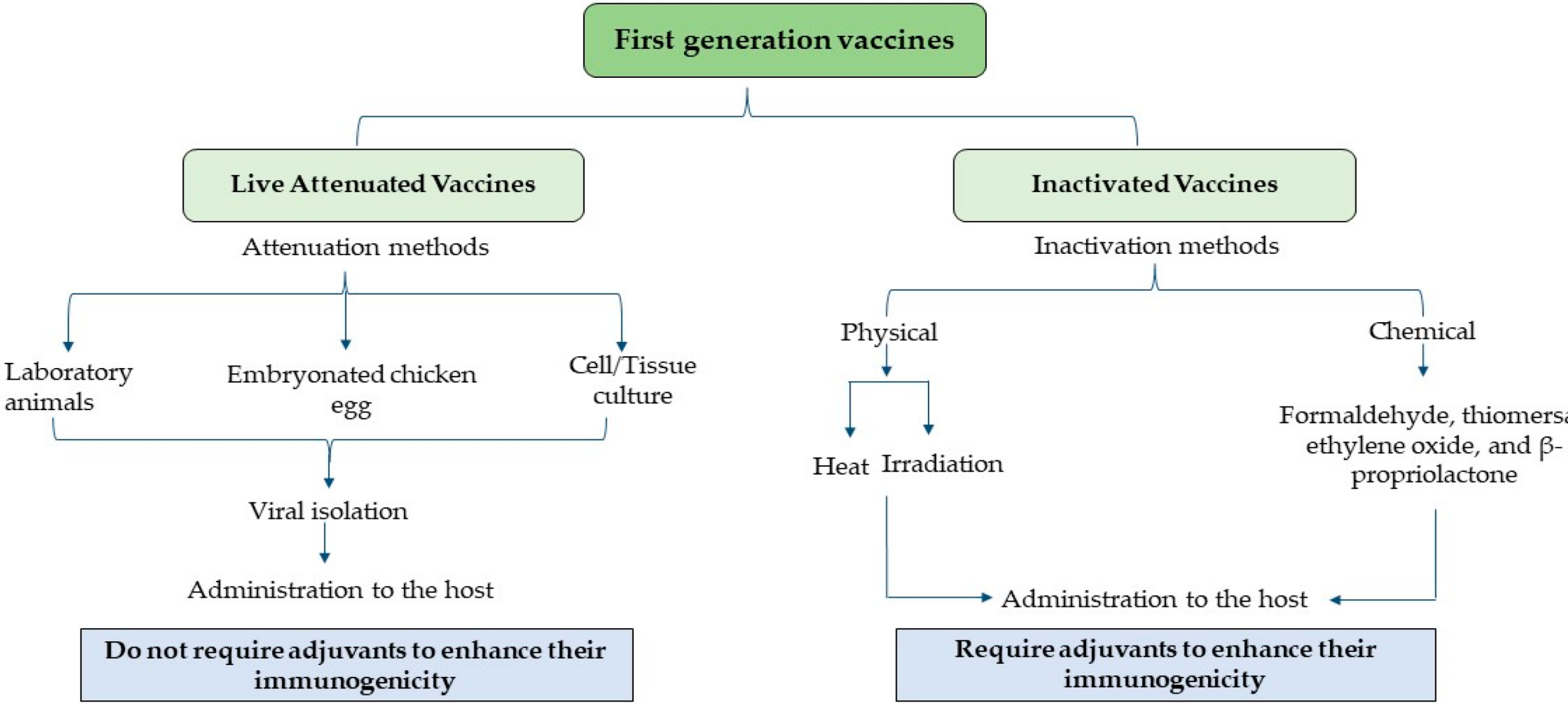
Types of Vaccines

1-Live vaccine.

2-Attenuated vaccine.

3-Killed vaccine.




First generation vaccines
Live Attenuated Vaccines
Inactivated Vaccines
Attenuation methods
Inactivation methods
Laboratory animals
Embryonated chicken egg
Cell/Tissue culture
Physical
Chemical
Heat
Irradiation
Formaldehyde, thiomersa
ethylene oxide, and β-
propriolactone
Viral isolation
Administration to the host
Administration to the host
Do not require adjuvants to enhance their immunogenicity
Require adjuvants to enhance their immunogenicity

Modified live vaccines (MLV); This type of vaccines contains a small amount of a bacteria or a virus which has been subjected to alterations or changes to render it incapable of causing clinical disease however capable of infection and also multiplying in the animal.

Chemically altered vaccines; in this type of vaccines, there are modified or altered live organisms that have been grown in a media with adjusted or controlled levels of certain chemicals that trigger and amplify the mutation of the organism as well as change the metabolism of the organism to alter its ability to cause disease.

Killed (Inactivated) vaccines (KV) and toxoids; these are either components of organism,killed microorganisms, or the by-product of an organism. A huge number of organisms and adjuvants (aluminium hydroxide or oil) to create adequate immune response are used by killed vaccine products. To enhance the immune response by increasing the stability of the vaccine in the body as well as to stimulate the immune system for a longer time, an adjuvant is used.

Subunit vaccines; A type of a killed vaccine that contains other microorganism or only a portion of the virus is known as subunit vaccine.

Vaccination Methods In Poultry

Different routes of administration of vaccines in poultry are:

1) Oculo-nasal route (drop into eye/nostril)
2) Oral route (in drinking water)
3) Aerosal route (spray)
4) Parenteral route (injection).
5- Eye drop technique or administration

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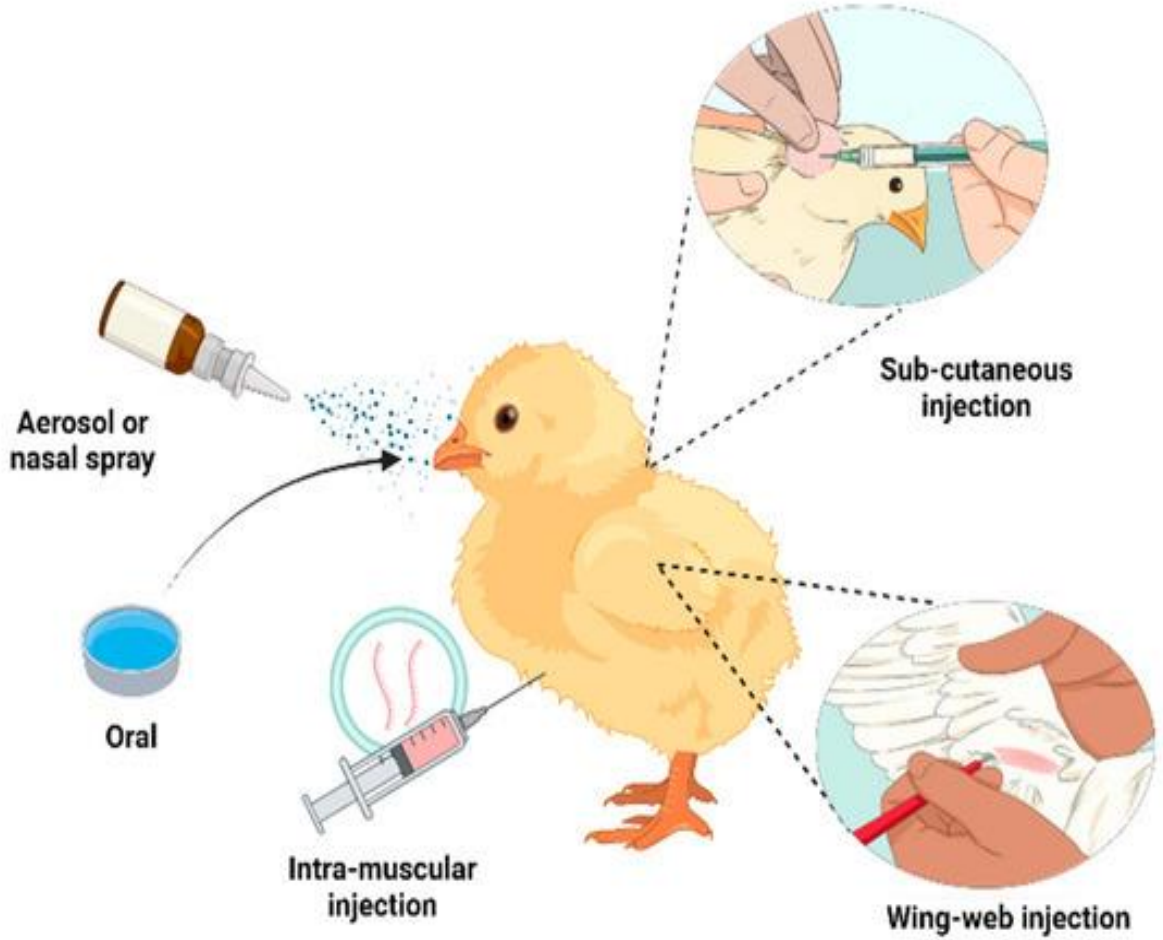

A-Drinking water

Adding the vaccine to the drinking water of your flock. This vaccination method is less time consuming and less stressful. The recommended technique is as follows:

1-All equipment used for vaccination is carefully cleaned and completely free of disinfectants and detergents (keep in mind that live vaccines administered via the drinking water can be destroyed by disinfectants and soap)

2-Only use cold, fresh and clean water (drinking water quality).3- Open the vaccine bottle under the water

4-Make sure the birds are thirsty to stimulate the intake of an adequate dose of the vaccine.

5-All the water present in the drinkers and nipple lines should be consumed prior to vaccination.

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6) The water should be free from chlorine or any drug-

B-Intramuscular injection

This method involves the use of a needle to insert the vaccine into the breast muscles of the chickens. The use of an automatic syringe can speed up the process as it makes the technique relatively easy and doesn't harm the bird. Regularly check the equipment to ensure that the correct dose is administered. Special care must be taken to ensure that the needle does not pass through into one of the key organs. Good hygiene and proper vaccine handling procedures can prevent unnecessary contamination.

C-Subcutaneous injection

Very similar as the intramuscular injection, but in this case the vaccine is injected under the skin, usually at the back of the neck. Sufficient attention must be given to ensure that the vaccine is injected into the chicken (not just into the feathers).

D-Wing stab

With this method, the vaccine is introduced into the wing by a special needle(s). These needles have a groove along their length from just behind the point. When dipped into the vaccine some of the vaccine remains on the needle to fill the groove. The needle(s) are then pushed through the web just behind the leading edge of the wing and just out from its attachment to the body of the bird. Care must be taken to select a site free of muscle and bone to prevent undue injury to the bird. Ensure that the needles penetrate the layers of skin at the ideal site. A common problem is for the vaccine to be brushed from the needles by fluff or feathers before it is brushed into the follicles.

E-Ocular eye drop

The vaccine is administered to the chicken's eye via an eyedropper. From here the vaccine makes its way into the respiratory tract via the lacrimal duct.

F-Intraocular (Eye Drop) or Nasal Instillation method

This method of administration by Eye drop/ Nasal instillation should be preferably used for small dose packs as it is necessary to consume reconstituted vaccine immediately. Take the vaccine product in sterile prescribed vaccine-dropper and instill one drop in eye or nostril. Ensure that the vaccine drop is completely absorbed in the nostril or in the eye. In Nasal Instillation method the vaccine drop is inhaled by the chick on momentary pressing of the beak. Intraocular method of vaccination gives better immune response.

G-Spray

The vaccine is sprayed onto the chickens, or into the air above the chickens, by making use of a suitable spray applicator, that controls the spray droplet size. The vaccine will fall onto the chickens and enters the body of other chickens as they pick at the shiny vaccine droplets. The chickens might also inhale small quantities. It is important to ensure an even distribution to all birds in the flock.

Some differences between live and inactivated vaccines

Live Vaccines	Atenuated Vaccines
1-Cheap to produce	Expensive to produce
2. Mass and individual vaccination in a form of spray or drinking water or dipping the eye water	Individual injection needed
3-Presence of a living organism	Do not have any living organisms
4-Provides strong immunity	Provides weak immunity
5-Less risk of causing allergies	High risk of causing allergies
6-Its stimulates immunity (for example trachea or gut)	Local immunity may be restimulated if used as a booster however the secondary response is poor or absent


Thank you