

# VACCINATION TECHNIQUES FROM HATCHERY TO PROCESSING

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Vaccination for commercial turkeys varies tremendously in the US. The use of vaccination against certain agents will be dependent on geographic location, detected challenge and poultry density. To protect poults early in life, maternal antibodies derived from the hen supply passive immunity to the poult. For this reason, the replacement breeder hen is an important focus in terms of immunization. Additionally, hens need to be thoroughly protected from disease agents that can cause egg production drops, shell quality changes and embryo mortality or hatchability problems. Vaccination programs for breeders are much more intensive than what will be discussed here, but they are critical to turkey production.

The typical diseases of current concern in meat-type turkeys are Newcastle Disease Virus (NDV), Hemorrhagic Enteritis Virus (HE), *Bordetella avium* (turkey coryza), *Ornithobacterium rhinotracheale* (ORT), Turkey Coronaviruses (TCV), *Pasteurella multocida* (Fowl Cholera) and *Escherichia coli* (E. coli). Other possible disease agents, such as Mycoplasmas and Avian Influenza, are reportable diseases and the use of vaccination is tightly controlled. Other diseases are geographically limited, PEMS and Avian Pneumovirus are examples.

For some of these diseases mentioned, there are no commercially available vaccines, such as ORT, turkey coronaviruses, and PEMS. An ORT vaccine was just recently approved in Europe, but it is an inactivated bacterin, labeled only for use in chickens. Work is being conducted at the University of Minnesota on several strains of ORT that appear to have promise as live vaccines. Since ORT can be vertically transmitted, turkey breeders are vaccinated with an autogenous bacterin that contains the particular challenge strain of ORT in that operation.

During processing in the hatchery there are options available to apply vaccines in the hatchery. The machinery that is designed to process poults also has an attachment that will allow for subcutaneous neck injection of an oil emulsion vaccine. This technique is used in some production areas for NDV protection, to reduce the reaction to a live field boost. This ability would be adaptable for other emerging disease problems, such as Avian Influenza. Spray vaccines are applied to the boxes of poults after processing. Products that can be used in this manner are the live NDV, *B. avium* (Art Vax<sup>®</sup>, Schering), and E. coli (Garavax T<sup>®</sup>, Schering). The products can also be sprayed on poults at the farm, as they are unloaded. The two bacterial vaccines are boosted additionally on the farm Art Vax<sup>®</sup> at 2 weeks and Garavax<sup>®</sup> at 3 weeks in the drinking water. These products can be re-administered every 4-6 weeks in the face of high challenge.

Live vaccinations for Newcastle Disease can be used during the brooder phase and at other times throughout grow-out. These products are typically B1B1 or Clone 30 types of NDV, presented in a freeze-dried or lyophilized form. Live viral vaccines can either be given by water or spray. Spray vaccination will tend to offer slightly more reaction, but that also means local and systemic immunity are being stimulated.

At 4-6 weeks of age, the birds are vaccinated for Hemorrhagic Enteritis. There are 2 types of products that are typically used – a commercially available product (Intervet, Arko Labs, Schering-Plough) or a spleen-derived product made in-house. Be sure to read the label instructions for each commercial vaccine, they vary in age that is recommended for administration.

Live *P. multocida* vaccines are often used in turkeys, only the M-9 (M-Ninevax<sup>®</sup>, Schering, Multimune<sup>®</sup> M, and Biomune) strain should be used. This product is given through the water to 6-week-old turkeys and revaccination should take place 3 weeks later. The immunity provided by this product is not permanent; revaccination should occur every 4-6 weeks after the initial two doses. Be sure to remove any antibiotic treatment around the use of this product 3 days prior and 5 days following administration. The antibiotic will inhibit the replication of the vaccine and prevent the immune response. Inactivated fowl cholera bacterins are also approved for use in turkeys. These products often contain multiple serotypes and will offer only protection to those serotypes. These products have to be injected either subcutaneously or intramuscularly and for this reason are typically only used in breeder hens.

In areas where Avian Pneumovirus has been isolated and creates clinical disease (Minnesota, Colorado) there is a conditionally licensed vaccine for that virus on the market. The vaccine is given to 1-week-old turkey poults by spray or drinking water and should be boosted 4 weeks later.

Proper administration of vaccines is vital to getting all birds adequately vaccinated.

### **Drinking Water Vaccination**

1. Cut off all chlorination 72 hours prior to running the vaccine.
2. Citric Acid should be run 48 hours prior to vaccination at 1 pack to 2 gallon of water for 12 hours. This helps to further clean water lines (optional)
3. Important to use distilled water to mix with vaccine, or chlorinated county/city water having allowed for the chlorine to evaporate overnight.
4. Add to water containing vaccine stabilizer. Follow manufacturer's recommendation on the amount of stabilizer to run per gallon of water (usually no less than 1 pack to 128 gallons of water). Can also use powdered skim milk as a stabilizer; use 3.2oz per 10 gallons of water.
5. Add a 4oz bottle of food coloring to indicate water containing vaccine
6. Add vaccine bottles. Dispose of empty bottles according to label.
7. Never use medicators, proportioners to administer live vaccines.
8. Use a pump to deliver vaccine into water lines.
9. Turn off water prior to vaccination. This withdrawal will be different depending on time of year. During warm weather (May – September) withhold water 1 – 1 1/2 hours and cool weather (October – April) 1 1/2 – 2 hours

10. The vaccine should be mixed in a volume of water so that it will last at least three hours and no more than four hours. Check water meters daily to determine how much each house is drinking. Divide the total gallons by 24 hours will help determine how much water is needed to vaccinate for three hours. Also take Age in weeks  $\times 5 = \#$  gallons consumed per thousand birds per day, then divide by 24 to get per hour, and then multiply times 3.
11. While vaccine is running, walk through the houses, encouraging birds to drink.

### **Spray Vaccination**

1. Important to use distilled water to mix with vaccine, or chlorinated county/city water having allowed for the chlorine to evaporate overnight.
2. Add vaccine to water containing vaccine stabilizer. Follow manufacturer's recommendation on the amount of stabilizer to run per gallon of water. New Spray Vac Stabilizer from Animal Science Products.
3. Have nozzles set to medium/coarse setting, 70-100 micron size (check with manufacturer of spray nozzles or vaccine to determine correct setting)
4. Previously determine pace that you need to walk through the house to get doses administered properly. Use water to determine this, not vaccine.
5. Turn off any ventilation running in the house before start spraying or roll up curtains.
6. Wear safety goggles and a facemask while spraying the products.
7. After spray is completed, let set for 20 minutes turn ventilation back on or lower curtains.

### **General Vaccine Guidelines for Live Vaccines**

1. Store in refrigeration until ready to use. Take to farm in cooler with ice packs. Avoid freezing. Avoid direct sunlight
2. Read all labels to make sure you have the right product, the right doses, etc.
3. Record serial numbers of products used, in case adverse reaction occurs. Serial numbers will help the manufacturer track the problem.
4. Wear gloves when mixing vaccines to prevent possible transfer into your eyes, mouth etc. This is important with NDV; it can cause conjunctivitis in people.
5. Record dates and times vaccines are administered, good to mark on mortality cards on the farm.
6. Follow withdrawal times on product label – 21 days prior to processing.

### **General Vaccine Guidelines for Inactivated Vaccines**

1. Store in refrigeration until night before vaccination. Leave at room temperature overnight to allow product to warm to room temperature.
2. Can warm in water bath the morning prior, do not heat to above 100°F
3. Shake oil emulsion products well prior to administration. Check for broken emulsions – white on top layer brown to clear on bottom.
4. Use sterile injection equipment.
5. Change needles often – at a minimum every bottle change (1000 birds), ideal to get changed every 500 birds.
6. Observe withdrawal times – 42 days prior to processing.