

Vaccination of Small Poultry Flocks ¹

J.P. Jacob, G.D. Butcher, and F.B. Mather²

WHY VACCINATE?

Vaccination is an effective means to prevent and/or reduce the adverse effects of specific diseases in poultry. Poultry refers to birds that people keep for their use, and generally includes chicken, turkey, duck, goose, quail, pheasant, pigeon, guinea fowl, pea fowl, ostrich, emu and rhea.

Disease-causing organisms can be classified, smallest to largest, as viruses, mycoplasma, bacteria, fungi, protozoa, and parasites. All these organisms are susceptible to chemotherapy, except viruses. Control of viral diseases is dependent upon prevention through sanitation and biosecurity, and by vaccination.

Strict sanitation and biosecurity are essential for successful poultry production. Vaccination is no substitute for effective management. It must be understood that vaccines may be effective in reducing clinical disease, but exposed birds, in most cases, still become infected and shed disease organisms.

DECIDING WHETHER OR NOT TO VACCINATE

Commercial poultry are usually vaccinated to protect them against a variety of diseases. Vaccination, however, is seldom practiced by small flock owners. There may be several reasons for this, including:

- Rarely have disease problems
- Unaware that disease is present
- Do not get the disease properly diagnosed
- Do not know where to purchase vaccines
- Too expensive because poultry vaccines usually come in 500 to 10,000 dose vials.

Unfortunately, small poultry flocks do suffer from many diseases which could be controlled through appropriate vaccination. These diseases may result in loss of income from the sale of eggs, meat or stock. Other losses may include death of valuable breeding stock, or the inability to participate at poultry shows. This can be especially devastating for youth with 4-H or FFA projects.

1. This document is PS36, one of a series of the Animal Science Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date April 1998. Reviewed April 2009. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

2. J.P. Jacob, poultry extension coordinator, G.D. Butcher, extension poultry veterinarian, and F.B. Mather, poultry extension specialist, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

Deciding whether or not to vaccinate against a disease depends on the likelihood that the birds in a flock may be exposed to that specific disease. If a flock is closed, such that new birds are never introduced and the birds that leave the farm are not permitted to return, the likelihood of many diseases is greatly reduced. In these cases, since the risk is small, the owner may decide not to vaccinate.

Vaccination should be considered if the flock owner has experienced one or more of the following:

- Takes birds to poultry shows
- Buys birds from hatcheries, bird auctions, or other sources and adds them to an existing flock
- Has had disease problems in the past

POSSIBLE VACCINES

Viruses stimulate the development of immunity better than do other types of microorganisms, so most successful poultry vaccines are against viral diseases.

Vaccines contain either live or killed micro-organisms. Live-virus vaccines reproduce in the host to increase their numbers. A killed-virus product is dependent upon the number of antigenic units (e.g., virus particles) present in the vaccine dose to stimulate antibody production. Most poultry vaccines are the live-virus type. Bacterial vaccines are live or inactivated preparations of bacteria and are termed bacterins.

Marek's disease

Marek's disease vaccine is usually administered to chickens at the hatchery on the day of hatch. It is given subcutaneously (under the skin) at the back of the neck. It is best to order chicks already vaccinated at the hatchery.

It has been demonstrated that the vaccine only prevents the appearance of Marek's disease tumors and paralysis. It does not prevent the birds from becoming infected with and shedding the Marek's virus.

Chickens 2 to 16 weeks of age (prior to sexual maturity) are susceptible to Marek's disease. While

Marek's disease can occasionally occur in pheasants, quail, game fowl, and turkeys, these poultry species do not normally receive Marek's vaccinations.

Newcastle disease

Chickens and turkeys can be immunized against Newcastle disease. Low-virulence live-virus vaccines are administered by a variety of routes such as drinking water, intraocular (eye drops), intranasal (nose drops), spray). Killed-virus oil emulsion vaccines are administered to pullets intramuscularly or subcutaneously as a final vaccine prior to the onset of egg production.

Chicks are often vaccinated at the hatchery against Newcastle disease and infectious bronchitis with a combination vaccine. Day-old poultry vaccinated for Newcastle disease can not be shipped through the mail.

The combination Newcastle-Infectious Bronchitis vaccine can also be given at 10-35 days. The vaccine can be administered via the drinking water, intraocular route or intranasal route. For breeder and layer flocks the vaccine needs to be repeated at 3-month intervals to maintain protective immunity. Alternatively, an inactivated vaccine can be given at the time of housing (18-20 weeks). Further vaccinations should not be required with this procedure. In breeder flocks, the high antibody level obtained by repeated vaccinations will assure transmission of a uniform parental immunity to offspring.

If you purchase pullets or mature chickens to add to your vaccinated flock, they can be vaccinated with Newcastle disease (B-1) vaccine via drinking water, intraocular or intranasal routes. The more reactive LaSota Newcastle disease vaccine is then given 4 weeks later.

Turkeys are often vaccinated against Newcastle disease at 4 weeks of age, and again when the breeders are housed.

Infectious bronchitis

Infectious bronchitis is primarily a respiratory disease of chickens. Modified live-virus vaccines (usually containing the Massachusetts serotype) are

administered in young chickens. Vaccines are effective only if they contain the right serotype of virus for a given area. Do not vaccinate during an outbreak.

Infectious bronchitis is often combined with Newcastle vaccine in the same vial and given at the hatchery or at 10-35 days of age (see section on Newcastle disease).

Killed-virus vaccines (oil emulsion base) are also available. They are administered by injection (subcutaneous or intramuscular) to breeders from 14-18 weeks of age.

Laryngotracheitis

Laryngotracheitis (LT) affects both chickens and pheasants. Vaccination against LT is not as successful as for other diseases, but is an excellent preventive measure for use in outbreaks and in epidemic areas. State approval is required prior to vaccination. Do not vaccinate unless you have a problem on your farm or in your area. If an owner chooses to vaccinate, all chickens on the premises must be vaccinated, including any new birds that are added later. Yearly boosters are advised.

The vaccine is administered by the eye- or nose-drop method. Birds should be at least 4 weeks old. Younger birds are less responsive to vaccines.

Rapid diagnosis and vaccination can also stop an outbreak from spreading in an infected flock.

Fowl pox

There are six closely related strains of pox virus. These are fowl pox, pigeon pox, quail pox, canary pox, psittacine pox, and ratite pox. Pigeon pox infects pigeons, chickens, turkeys, ducks, and geese. Canary pox infects canaries, chickens, sparrows, and probably other species. In some instances, but not always, exposure to one of the viruses stimulates development of immunity to that virus and one or more of the other viruses.

Pox can be prevented in chickens, turkeys and pigeons by vaccination, but there is no effective commercial vaccine against canary pox.

Chickens and pigeons are usually vaccinated by the wing web stick method. An applicator with two slotted needles is dipped in vaccine and thrust through the wing web. Turkeys are not generally vaccinated by the wing web route. Turkeys sleep with their head under the wing. Conjunctival (eye) pox can occur if the vaccine is administered to turkeys via the wing web. Instead, turkeys are vaccinated by a thigh-stick method.

On farms with severe fowl pox problems, vaccination of all domestic poultry may be necessary. All domestic chicks and poults can be vaccinated at 1 day of age, pullets at 10 to 12 weeks, and turkeys at 8 to 14 weeks or when moved to range.

In endemic areas, the prevailing virus type should be determined. Quail pox has been shown to affect chickens. There is no cross protection between quail pox and fowl pox. Vaccination for both may be necessary if both are endemic in the area. Flocks can be given fowl pox vaccination to reduce the severity of an outbreak.

Do not vaccinate unless you have a problem on your farm or in your area. The virus is spread from bird to bird through the bites of blood-sucking insects (such as mosquitos) or through wounds and scratches by the birds when fighting. If there is a heavy mosquito infestation in an area, small flock owners may consider vaccinating with fowl pox vaccine.

In problem areas requiring fowl-pox vaccination of baby chicks, the flock should be revaccinated after reaching 8 weeks of age or older to assure lasting immunity.

Fowl cholera

Fowl cholera affects most birds including domestic fowl (primarily chickens and turkeys), game birds (especially pheasants), ducks, cage birds, wild birds, and birds in zoological collections and aviaries.

There are two types of fowl cholera vaccines -- live attenuated and inactivated bacterins. The oral vaccine is a live attenuated culture that is administered in the drinking water. Such vaccines are available for chickens and turkeys. Oil-emulsion

bacterins require a series of two injections given at 4 week intervals.

Do not vaccinate for fowl cholera unless you have had a problem on your farm or in your area.

Avian encephalomyelitis

Avian encephalomyelitis (AE) is a viral infection of poultry, primarily chickens, turkeys, pheasants, and coturnix quail. Lifetime immunity is acquired through vaccination or recovery from a natural outbreak. Breeder chickens are vaccinated at 10-16 weeks of age. The vaccine is administered in the drinking water. Pheasants are vaccinated at 5-10 weeks of age and bobwhite quail at 6-10 weeks of age.

Avian encephalomyelitis should not be confused with St. Louis encephalitis. St. Louis encephalitis is transmitted by mosquitos and affects humans, with the severity of the disease influenced by the age and immune status of the person affected and the virulence of the virus. Domestic animals including the dog, cat, horse, chicken, etc., do not develop clinical signs of St. Louis encephalitis after being bitten by an infected mosquito.

SOURCES OF VACCINE

Hatcheries and poultry suppliers are usually the best sources for vaccines. Be sure to carefully follow label directions when vaccinating.

Many effective vaccines are available for the small flock owner. Diseases such as Marek's disease or fowl pox need not cause devastating losses in any flock, regardless of its size.

Unfortunately, poultry vaccines are produced in large dose vials intended for commercial use. This is for the convenience of vaccine manufacturers and of commercial producers who often have several thousand birds to vaccinate at one time. This, however, should not prevent the small producer from immunizing his birds. Plan to vaccinate the entire flock at one time, and possibly coordinate vaccination with neighboring poultry flock owners so the vaccine and expense can be shared.