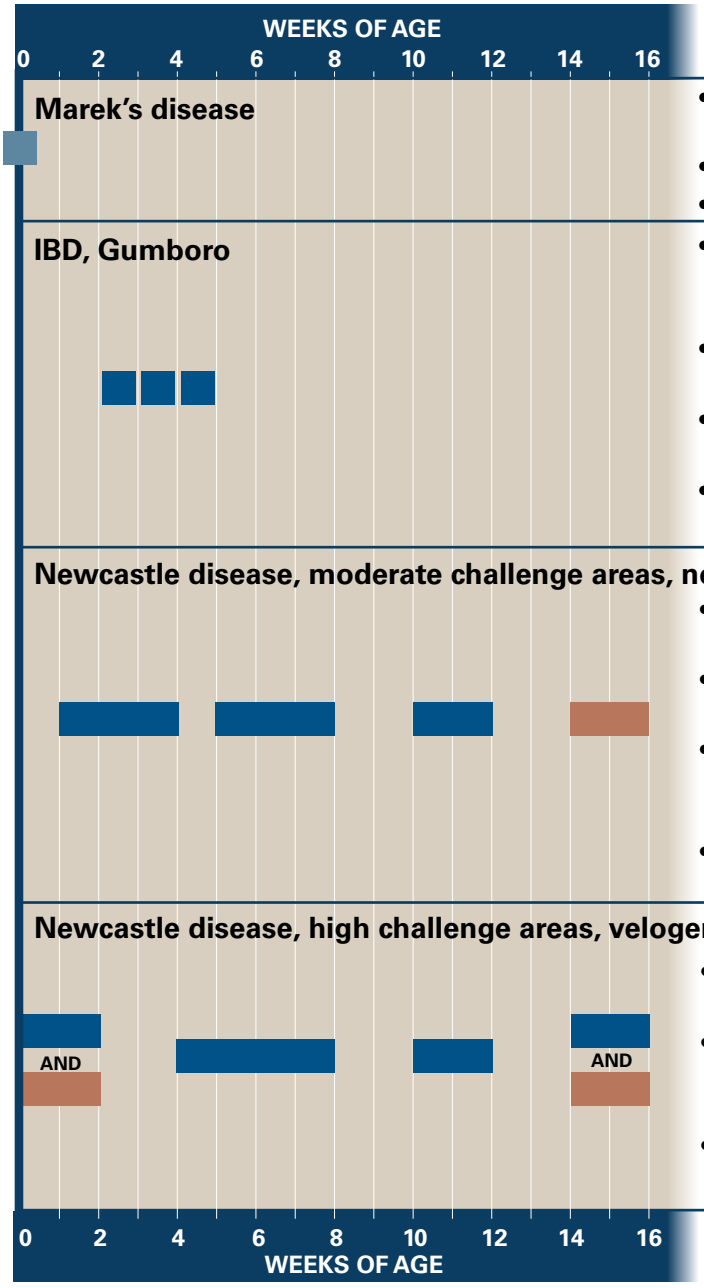
Technical Update

VACCINATION RECOMMENDATIONS

Certain diseases are too widespread or difficult to eradicate and require a routine vaccination program. In general, all layer flocks should be vaccinated against Marek's disease, Newcastle disease (NDV), infectious bronchitis (IB), infectious bursal disease (IBD or Gumboro), avian encephalomyelitis (AE) and fowl pox. Other vaccinations are added to the program as local disease challenges dictate.

A single program cannot be recommended for all regions. Follow label instructions provided by the vaccine manufacturer. Use only approved vaccines. Consult with local veterinarians to determine the best vaccination program for your area.

BASIC COMMERCIAL LAYER VACCINE APPLICATIONS



Marek's disease

- All commercial layers should be vaccinated with Marek's vaccine in hatchery
- Rispens or Rispens / HVT vaccine preferred
- HVT / SB1 used in low challenge areas

IBD, Gumboro

- Given between days 15–18, 21–25, 28–32, IBD live intermediate or intermediate plus strains based on maternal antibody decline and field challenge
- Drinking water vaccination preferred; spray vaccination is discouraged
- HVT—IBD vector vaccine available for hatchery administration (see Recombinant Vaccines)
- For more information, see the "Infectious Bursal Disease (IBD, Gumboro)" technical update

Newcastle disease, moderate challenge areas, no velogenic Newcastle present

- 2–3 live vaccinations, allow 4–6 weeks between last live vaccination and injected inactivated vaccine
- At least one live vaccination during grow should be applied as spray for best mucosal immunity
- Live boosting vaccinations every 30–60 days during production period may be needed in long-cycle flocks to maintain high immunity
- For more information, see the "Newcastle Disease" technical update

Newcastle disease, high challenge areas, velogenic Newcastle present

- Simultaneous live (eye drop) and inactivated vaccine provides good protection in high challenge areas
- Live boosting vaccinations every 30–60 days during production period may be needed in long-cycle flocks to maintain high mucosal immunity
- For more information, see the "Newcastle Disease" technical update

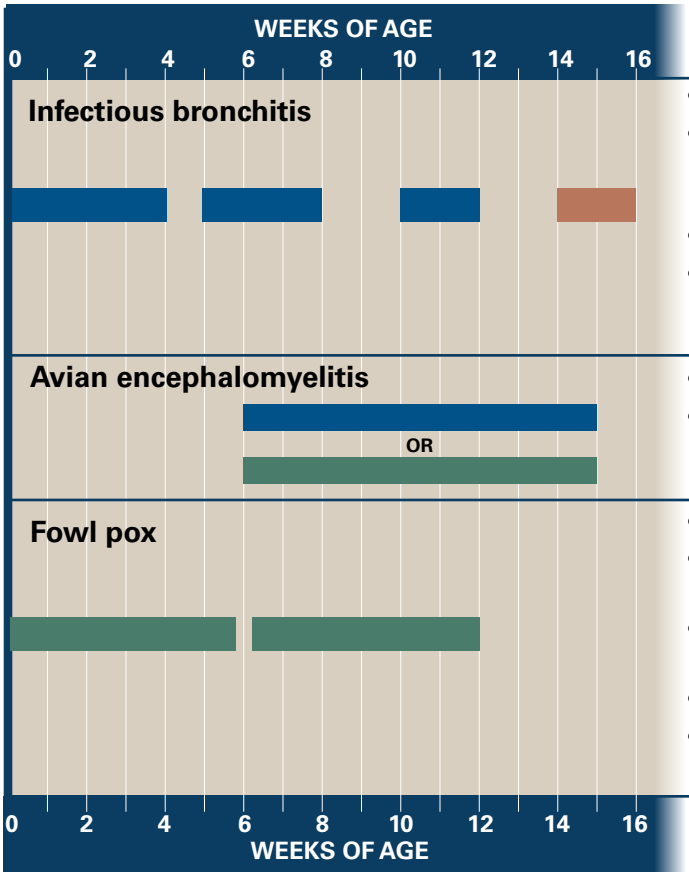
Live hatchery vaccines, given subcutaneous

Live vaccines, administered by drinking water, spray or eyedrop

Live vaccines, administered via wing-web inoculation

Inactivated vaccines, injected via intramuscular or subcutaneous route

BASIC COMMERCIAL LAYER VACCINE APPLICATIONS (CONTINUED)



Infectious bronchitis

- Use Newcastle-bronchitis combination vaccines
- 2–3 live vaccinations using multiple IB serotypes build cross-protective immunity (if serotypes have been identified in the area)
- Last live vaccination should be administered as a spray
- Live boosting vaccinations every 30–60 days during production period may be needed to maintain high mucosal immunity

Avian encephalomyelitis

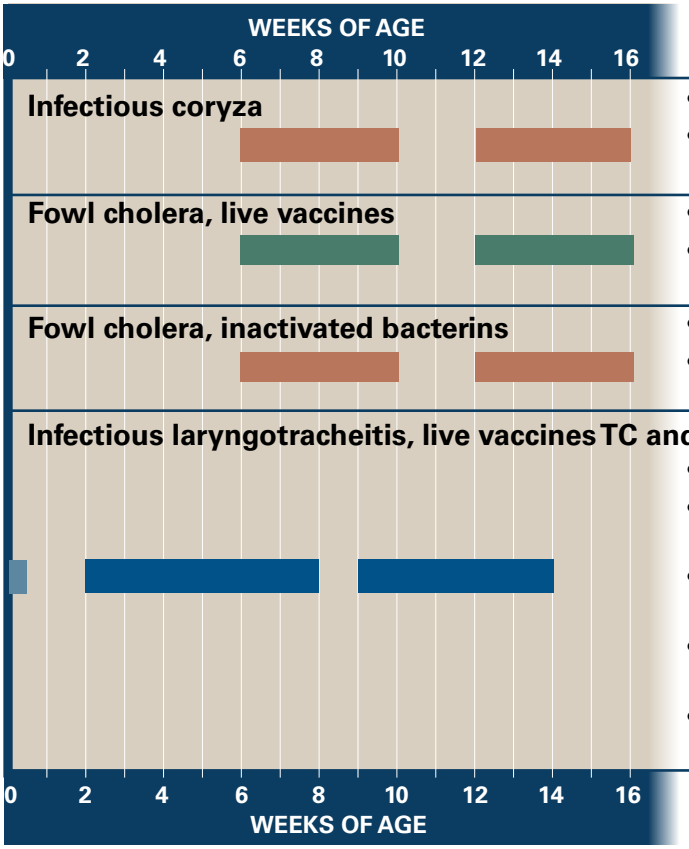
- Given once between 6 and 15 weeks to prevent egg drops
- Given via drinking water or often combined with fowl pox vaccine as a wing-web inoculation

Fowl pox

- 1 or 2 vaccinations
- Vaccination in birds less than 6 weeks should use highly attenuated fowl pox vaccine or pigeon pox
- Use pigeon pox with fowl pox to provide better cross-protection
- Most outbreaks due to poor vaccination technique
- For more information, see the "Fowl Pox in Layers" technical update

OPTIONAL COMMERCIAL LAYER VACCINE APPLICATIONS

Use if these diseases are prevalent in the area. Follow label instructions provided by the vaccine manufacturer. Use only approved vaccines. Consult a local veterinarian for advice in designing an effective vaccination program for your farm.



Infectious coryza

- 2 vaccinations separated by 4 weeks
- Autogenous bacterins utilizing local isolates are sometimes used

Fowl cholera, live vaccines

- 2 vaccinations separated by 4 weeks
- Live cholera vaccines such as M-9 or PM-1 are sometimes used

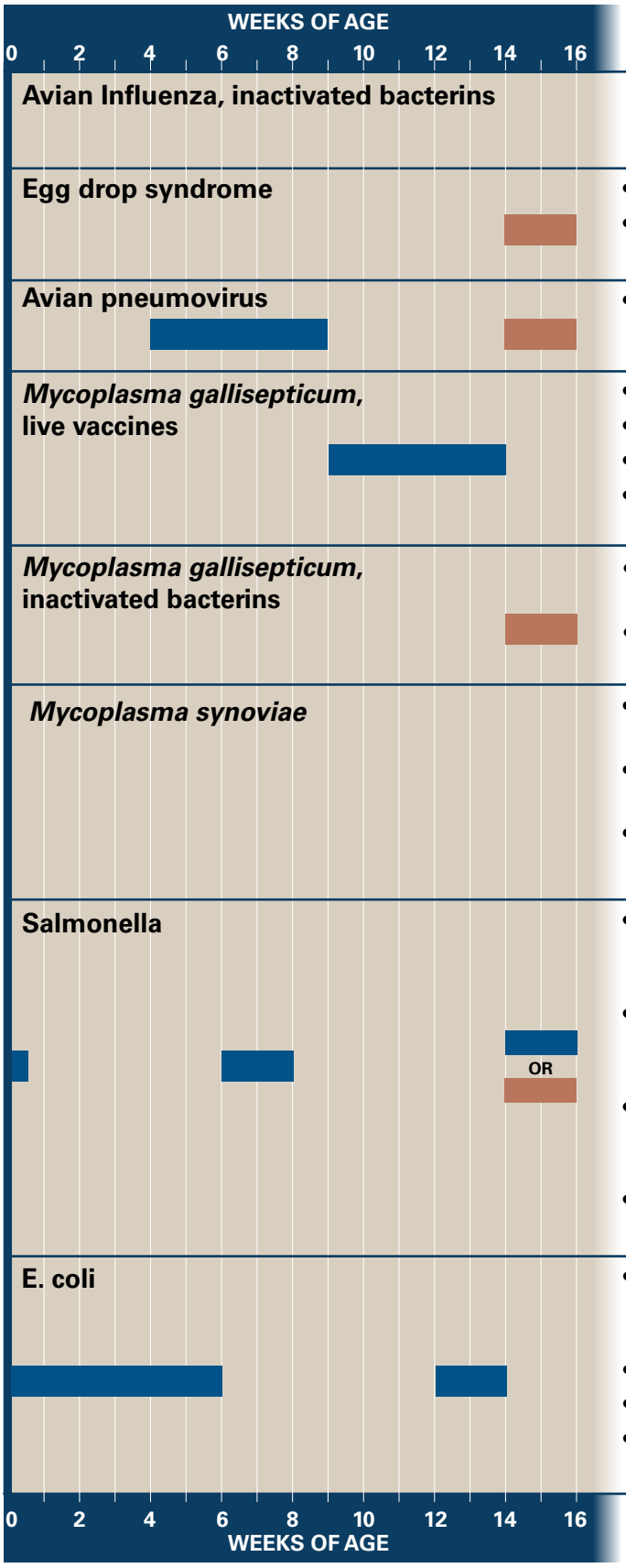
Fowl cholera, inactivated bacterins

- 2 vaccinations separated by 4 weeks
- Autogenous bacterins utilizing local isolates are sometimes used

Infectious laryngotracheitis, live vaccines TC and CEO

- Eye drop is the preferred method of vaccination
- Do not vaccinate within 7 days of another live respiratory vaccine
- Many ILT outbreaks are due to unwanted spread of ILT vaccine
- ILT-HVT and ILT-pox vector vaccines available for hatchery administration
- For more information, see the "Infectious Laryngotracheitis (ILT)" technical update

OPTIONAL COMMERCIAL LAYER VACCINE APPLICATIONS (CONTINUED)



Egg drop syndrome

- 1 inactivated vaccination is highly effective
- For more information, see the "Egg Drop Syndrome (EDS)" technical update

Avian pneumovirus

- Vaccination programs using both live and killed vaccines are most effective

***Mycoplasma gallisepticum*, live vaccines**

- Live vaccines can control economic impact of MG infection
- TS-11 and 6/85 strains are milder non-spreading strains
- Use F-strain for stronger protection
- For more information, see the "MG Control in Commercial Layers" technical update

***Mycoplasma gallisepticum*, inactivated bacterins**

- MG bacterins available in combination with Newcastle and bronchitis
- For more information, see the "MG Control in Commercial Layers" technical update

Mycoplasma synoviae

- MS-H is a temperature sensitive strain; frozen vaccine -70°C, applied by eyedrop in birds 3-6 weeks old
- MS-1 is a attenuated field strain (WYU 1853, lyophilized, applied by fine spray (<20 microns) in birds 6 weeks or older
- For more information, see the "Mycoplasma Synoviae" technical update

Salmonella

- Salmonella vaccination reduces colonization of internal organs and intestinal tract, reduces intestinal shedding into the environment
- 2 or 3 live vaccinations with modified Salmonella Typhimurium strain followed by an inactivated bacterin offers best protection
- Live vaccines provide good protection against strains within same serogroup and variable protection against field strains of other serogroups
- Inactivated bacterins can provide targeted protection against a particular strain

E. coli

- Live attenuated vaccine recommended for coarse spray application in the hatchery or in the rearing house the first few (0-6) weeks
- Second vaccination at 12-14 weeks
- Can be combined with other live sprayed vaccinations
- For more information, see the "Colibacillosis in Layers" technical update

Live hatchery vaccines, given subcutaneous

Live vaccines, administered by drinking water, spray or eyedrop

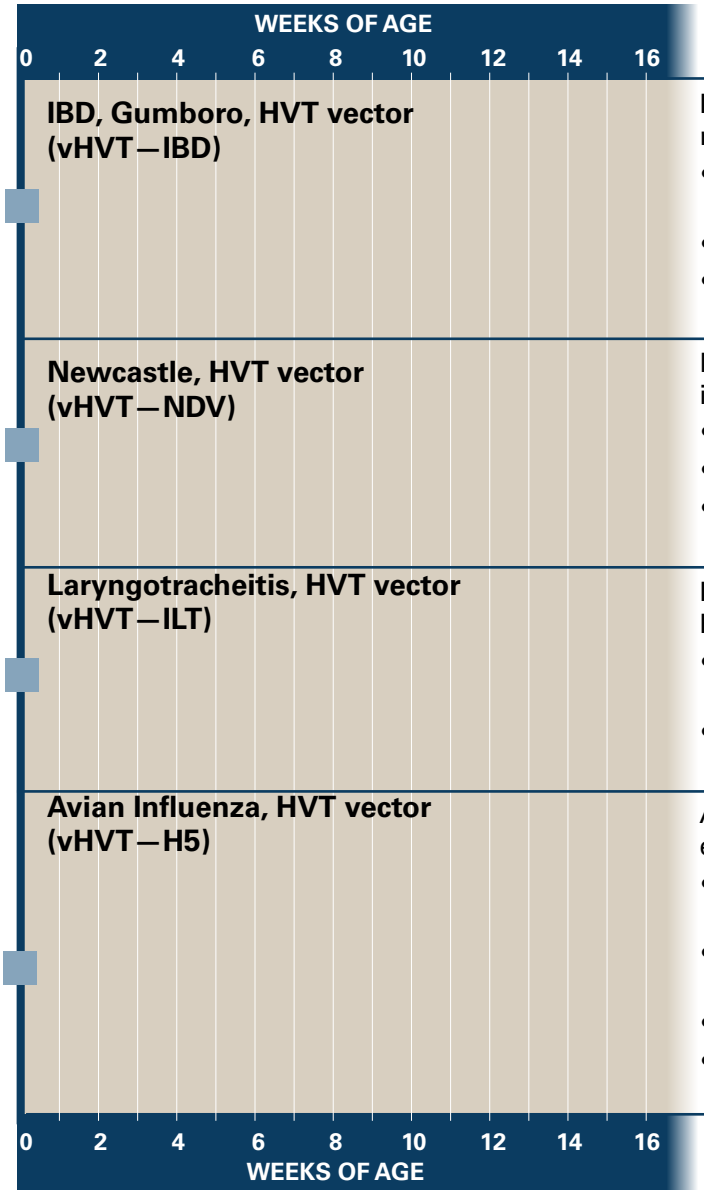
Live vaccines, administered via wing-web inoculation

Inactivated vaccines, injected via intramuscular or subcutaneous route

RECOMBINANT HVT VACCINES

Vaccines using recombinant vector technology offer the convenience of hatchery administration without the adverse effects caused by some live field vaccinations. For best Marek's disease protection use Rispens vaccine in combination with recombinant HVT vaccine.

CAUTION: Do not use another HVT vaccine when using HVT-vectored vaccines.



IBD, Gumboro, HVT vector (vHVT—IBD)

IBD protective gene (VP2) inserted into non-essential region of HVT virus

- Eliminates need for field vaccinations with live IBD vaccines
- No interference from maternal antibodies
- For more information, see the "Infectious Bursal Disease (IBD, Gumboro)" technical update

Newcastle, HVT vector (vHVT—NDV)

NDV protective genes (fusion protein and neuraminidase) inserted into non-essential region of HVT virus

- Reduces number of live field vaccinations
- Inactivated vaccine still needed for best long-term protection
- For more information, see the "Newcastle Disease" technical update

Laryngotracheitis, HVT vector (vHVT—ILT)

ILT protective genes inserted into non-essential region of HVT virus

- May reduce need for live vaccination depending on field challenge
- For more information, see the "Infectious Laryngotracheitis (ILT)" technical update

Avian Influenza, HVT vector (vHVT—H5)

Avian influenza H5 protective genes inserted into non-essential region of HVT virus

- Provides protection against any H5 influenza virus without the need for additional vaccinations
- Use of influenza vaccine is generally restricted to countries or regions where the disease is endemic
- Duration of protective immunity unclear
- For more information, see the "Low Pathogenic Avian Influenza" technical update

Live hatchery vaccines, given subcutaneous

Live vaccines, administered by drinking water, spray or eyedrop

Live vaccines, administered via wing-web inoculation

Inactivated vaccines, injected via intramuscular or subcutaneous route

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