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Optimum Solving ... Optimum Recovery

Infectious Bursal Disease

Vaccination

Plan of Talk

- Hyperimmunisation of breeders
- Vaccination and maternal immunity
- Types of vaccines
  - Live vaccines
  - Choosing live vaccine
  - Timing of vaccination
  - Characteristics of good life vaccine

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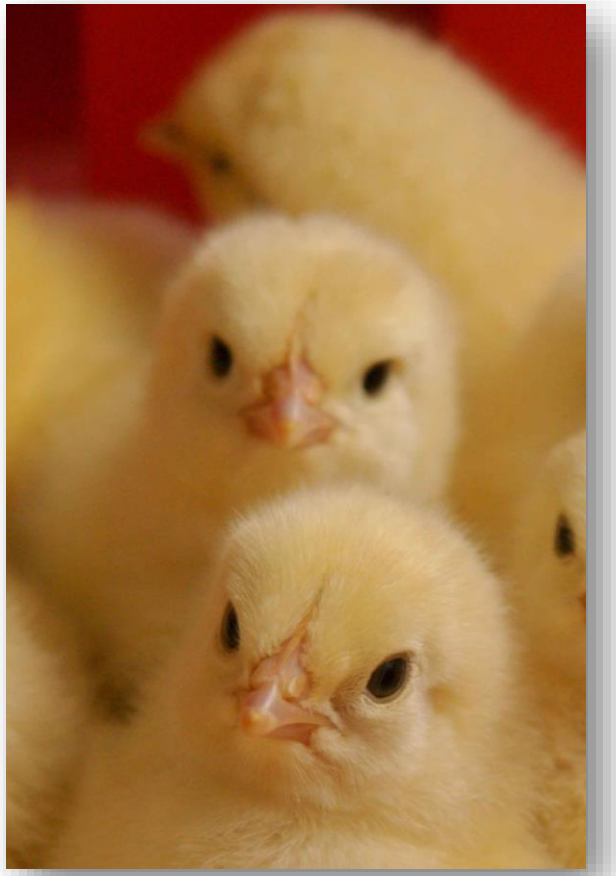
Parent breeder chickens are hyperimmunised against IBDV.

To protect young chick during the first one to two critical weeks post hatch.



Live IBD Vaccine (2)

4 - 10 weeks of age

Inactivated IBD vaccine (1)

16 - 18 weeks of age or before onset of production

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IBD Vaccine and MDA (Maternal Derived Antibodies)

- Since IBDV enters through the oral route, and should find its way to the bursa via the blood stream, any MDA in chick blood would neutralize the vaccine.

MDA Decrease

- MDA is protective when present at a sufficiently high titre.
- Due to metabolism and growth, the antibody titre declines to half (t1/2) at a rate of:
  - Broilers 3.5 days
  - Broiler breeders 4.5 days
  - Layers 5.5 days
- 2 to 3 weeks post hatch, the susceptibility of a chicken flock to an IBDV infection increases.

MDA & Vaccination

› Breeder flocks are immunized against IBD, so they would confer protective antibodies to their progenies.

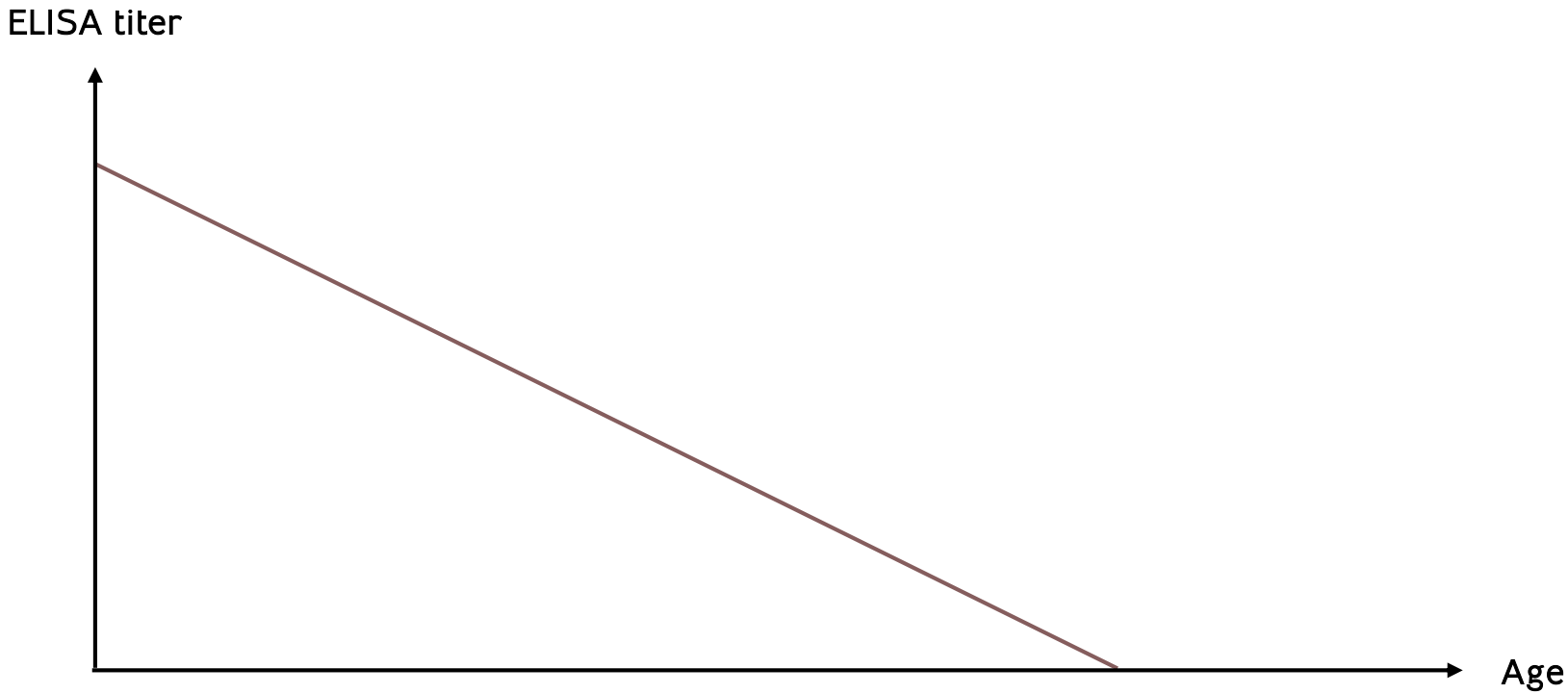
Advantage

– Protects chickens from early infection.

Disadvantage:

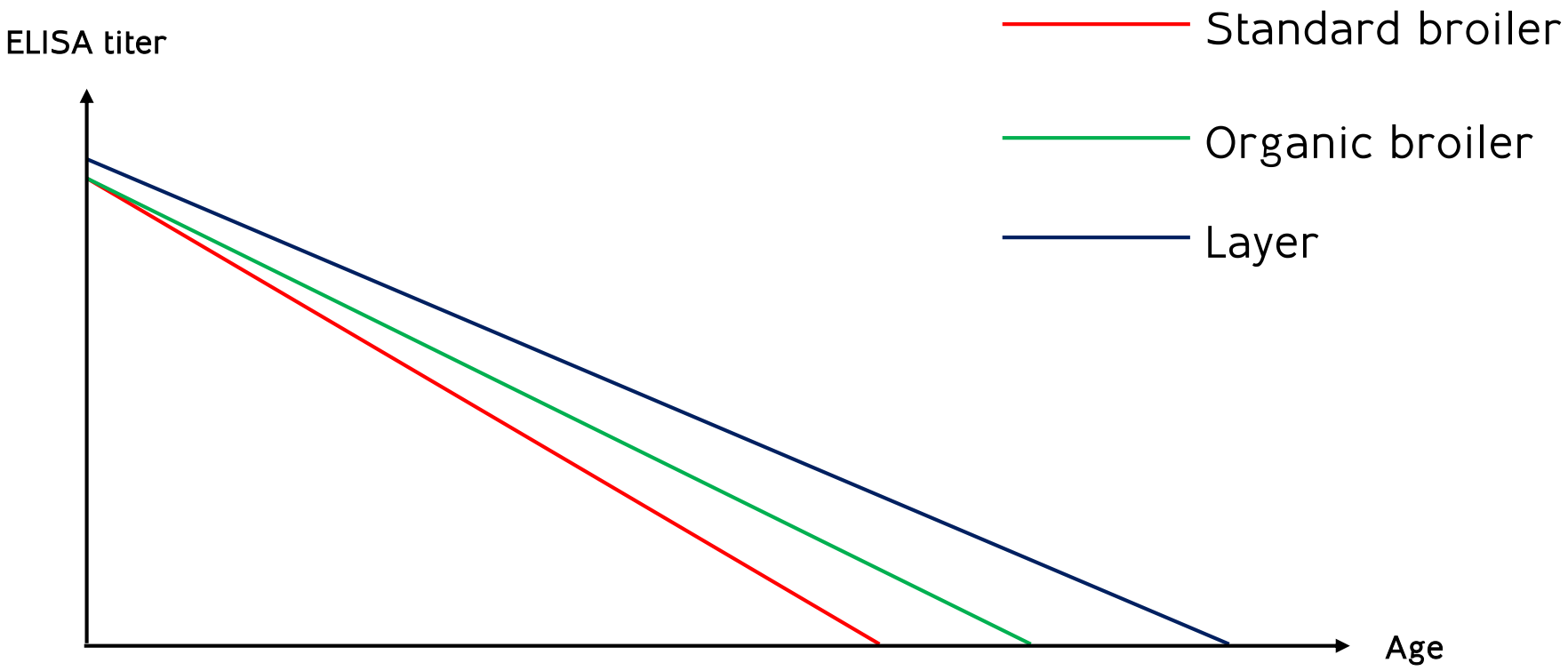
– Neutralizes live vaccines.

MDA Decrease

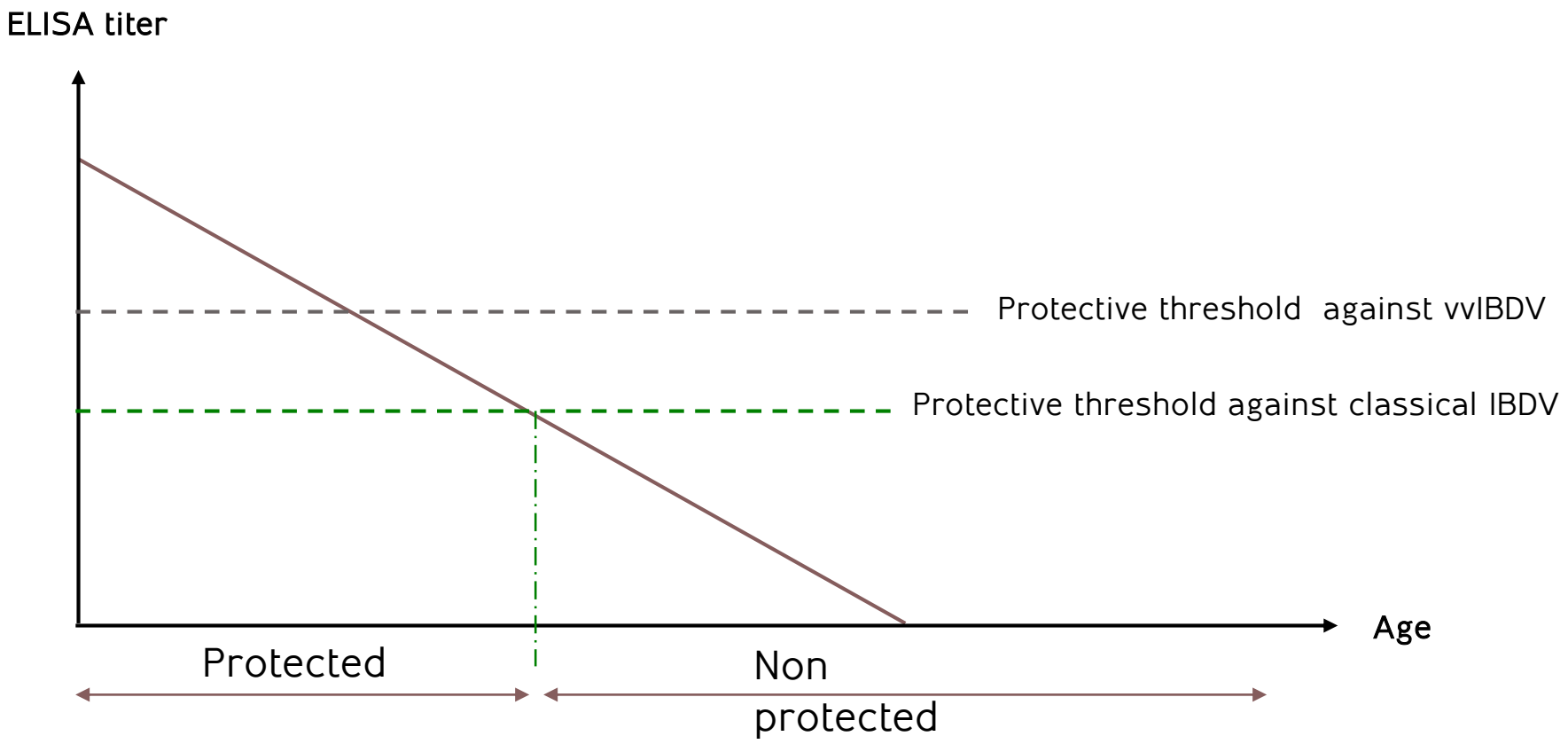


- Maternal antibody will normally protect chicks for 1-3 weeks
- By boosting the immunity in breeder flocks with oil adjuvanted vaccines, passive immunity may be extended to 4 or 5 weeks

MDA Variation



MDA Protective Threshold



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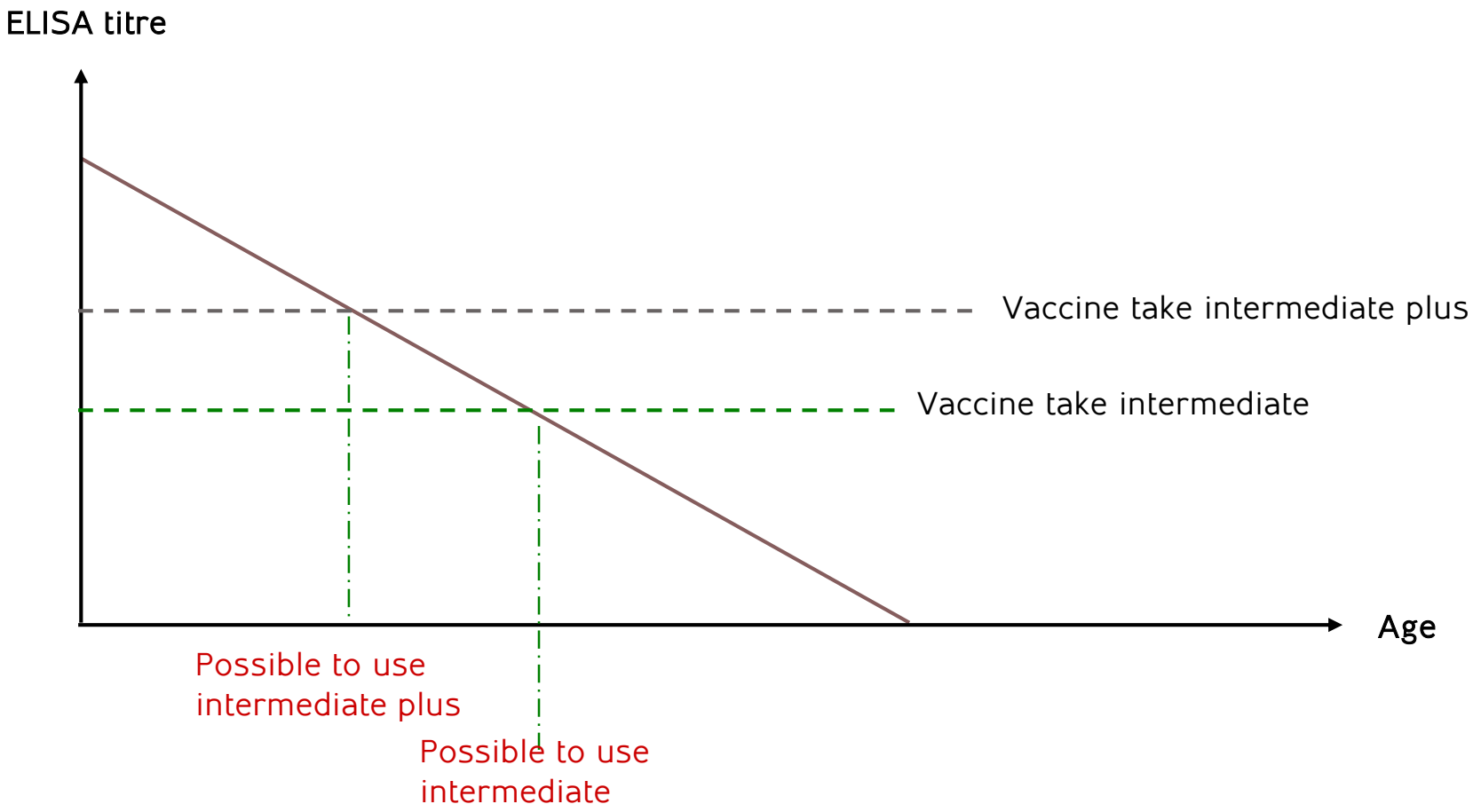
ELISA titre
Vaccine take intermediate plus
Vaccine take intermediate
Age
Possible to use intermediate plus
Possible to use intermediate

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Types of IBD vaccines

1. Life attenuated vaccines
2. HVT Recombinant Vaccine
3. Virus-Antibody Complex Vaccines
4. Inactivated vaccines

Live Attenuated Vaccines

Live attenuated vaccines

- They are administered as the primary defense in the young susceptible chicken.
- Commercial live vaccines are classified into 3 groups:
    a) Intermediate strains
    b) Intermediate plus strains
    c) Hot strains

HVT Recombinant Vaccine

Composition

- The concept of recombinant vaccines is to insert genes of critical immunizing epitopes (VP2) of IBD virus into a vector virus HVT (herpesvirus of turkeys).
- While the vector virus replicates, the VP2 also replicates at the same rate resulting immunization against both.

Precautions

- The HVT is usually a slow replicating virus, it induces immune response after 14 days.
- Adding a gene to the HVT may slows its replication and extends the 14 days.

Immune Complex Vaccine

Composition

Antibody specific for the virus

+

Vaccine virus

- Both are mixed in an appropriate ratio.
- The antibodies surround the vaccine virus.

Cont. ...

Significance of adding antibodies

- The presence of antibodies protect vaccine virus from being neutralized by MDA.
- Antibodies delay, by several days, the normal course of vaccine virus replication.
- This process controls the time of releasing vaccine virus.

Precaution

- The level of MDA should be adjusted to the vaccine virus strain.

Inactivated vaccines

- They are administered to boost the immunity of parent birds.
- Not used for layers

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Live Vaccines

Objective of using life vaccines:

› Live vaccines are administered to achieve active immunity.

Classification of Live Vaccines

Live vaccines are classified into 3 groups according to their ability to break through levels of MDA.

1. **Mild**
   - These vaccine strains are highly attenuated.
   - They can break through very low levels of MDA.
   - They are no longer applicable in the commercial environment.
2. **Intermediate**
   - They are attenuated IBDV strains.
   - They can break through MDA titres $\leq$ 6 log2 VN
3. **Intermediate Plus/Hot**
   - They are less attenuated IBDV strains
   - They can break through MDA titres $\leq$ 8 log2 VN

When to Use More Invasive Vaccine?

- The main feature of the presence of very virulent IBDV field challenge is increased mortality.
- vvIBDV can break through higher levels of MDA than intermediate IBDV vaccines infections can occur before it is possible to immunise the chicks with intermediate vaccines.
- To be able to compete with such vvIBDV viruses and induce immunity in the face of still high maternal immunity, more invasive IBDV vaccines strains are required.
- The main objective is to reduce mortality and the prevalence of vvIBDV in the flocks
- Once this aim has been reached return to intermediate vaccines

General Recommendations

- In farms with IBD problems or in "hot areas"
  1. Use a hot or intermediate plus vaccine 3 – 4 cycles;
  2. Followed by an intermediate vaccine
- In "endemic" areas, multiple age farms and farms relying solely on hot vaccines
  1. Use continuously a hot vaccine.

Whenever possible try to switch back from a hot vaccine to an intermediate

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Choosing Live Vaccine

Choice of live vaccine depends on:

1. **Virulence of field infection**
   - Mild and Intermediate vaccine strains can not protect against vvIBDV.
   - Mild and Intermediate vaccine strains cannot be administered at an early age due to MDA interference.
2. **Age of chickens to be vaccinated**
   - The earlier the vaccination the higher the level of MDA, requiring a stronger vaccine.
3. **Age at which Gumboro outbreak occurs.**
   - Early outbreaks require earlier vaccination.
   - Infections before 2 weeks require using vaccine that cover variant strains.
   - Late infections requires intermediate plus or hot strains.

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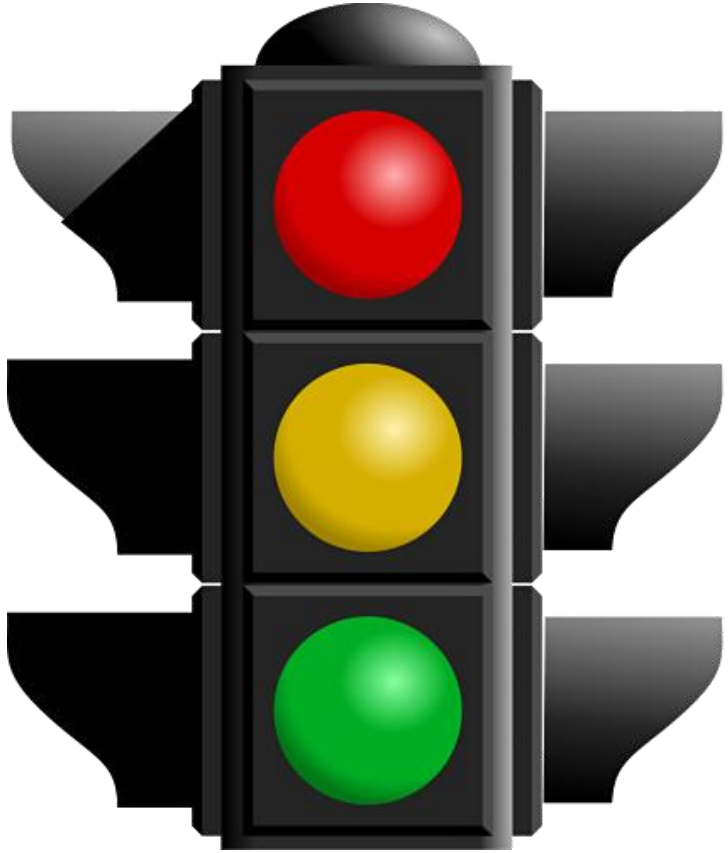
Timing of Vaccination

- Too soon
  - MDA neutralises vaccine
- Late
  - Late protection
- Optimal
  - Sooner the better



Cont. ...

There is no IBD vaccination schedule that can be routinely recommended.

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Factors influencing a vaccination schedule include:

1. Type of chicken to be vaccinated (broiler or commercial layer).
2. Level of MDA
   - The higher the start level of MDA the later the age of vaccination.
3. Uniformity of MDA
   - If the variation in MDA levels is too high (CV>30%) a second IBD live vaccination is required to effectively immunize the flock.
4. Field pressure.

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Characteristics of Good Life Vaccine

1. Early protection.
2. Minimum immunosuppression.
3. Highest antibody titer.
4. Cross protection between different strains.
5. Easy application.

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