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SCHERING-PLOUGH ANIMAL HEALTH
technical services bulletin

COCCIVAC®-D

Ensuring and Monitoring Immunity Development
Guidelines for Monitoring Post-Vaccine Reactions and Treatment

The main objective of using any vaccine is to stimulate the development of an immune response that is effective in protecting against disease with a minimum or absence of post-vaccination reaction.

In the case of coccidiosis, most protection is the responsibility of cell immunity. Thus, maintenance of the intestinal integrity, health status of the birds, uniformity of vaccine application and uniform oocyst cycling in the birds' intestines are critical for the success of a **Coccivac®-D** program.

Key Points

- **Coccivac-D vaccine enables the development of life long immunity against all Coccidia species of economical importance in chickens**
- **When properly administered to the birds and the brooding and management conditions are favorable, Coccivac-D vaccine induces an early, mild and predictable pattern of lesions**
- **Medication with anticoccidial drugs (for example amprolium) during the phase of immunity development is not necessary when proper administration and management accompany the vaccination process. It may however interrupt the development of immunity, increasing the risk of later coccidial challenges**
- **The use of anticoccidial drugs in the first 4 weeks of a bird's life should always be at low dosages and can only be determined by a criterious evaluation of the level of lesions**

Evolution of immunization against poultry coccidiosis

Historically, amprolium (or other anticoccidials) has been used in low levels (1/4 of the dose) to control the field challenge of birds that received a low dose of the vaccine and to control reactions of birds that received high doses during administration. In the past, amprolium was given on the 10th day after vaccination on two consecutive days.

As mentioned, amprolium was used to control reactions and avoid mortality without interrupting immunity development. The use of this drug, however, in high doses and/or for long time periods can interfere with the development of immunity (cycle uniformity) in birds that were correctly vaccinated. While amprolium can interfere with immunity development of all *Eimeria* species, particular care should be taken to avoid interfering with

Eimeria necatrix cycling. *Eimeria necatrix* produces a low number of oocysts and, as a consequence, immunity development takes longer. The excessive use of amprolium can interfere with the development of immunity against this specie and *Eimeria necatrix* outbreaks can occur in birds between 4 and 6 weeks of age or later in periods of stress (feed restriction, transfers, beginning and peak of production).

Management of birds vaccinated with Coccivac®-D vaccine

- The brooding pen should be opened for the first time between the 3rd and 4th day of life.
- Remove the caked litter that remains around the drinkers and feeders, spreading a small amount of this litter (only the superficial litter) over the new litter as the pen is gradually opened. This should be done until the birds are 21 days old.
- Provide more space (new litter) for birds between 8 and 14 days of age. The goal is to distribute the birds in the total available area as soon as possible, as shown in the chart below.

Suggested standardization of the stock density per square meter.

Males	Chicks/m2
1st to 3rd day:	35-36
4th day: remove the panels, add an empty space	17.5
5th day: add an empty space	11.6
7th day: add an empty space	8.75
9th day: add an empty space	7
11th day: add an empty space	5.8
13th day: add an empty space	5
15th to 17th day: provide the whole area	4

Females	Chicks/m2
1st to 3rd day:	36
4th day:	24
6th day:	18
8th day:	14.5
10th day:	12.3
12th day:	10.6
14th day:	9.3
16th day:	8
17th to 18th day:	6-7

Observation: This information should take into account the specific housing standards for each breed provided by their Management Manual.

Special attention to the feeding of the birds

- During the first 4 weeks of the bird's life, none of the following products should be given: Chlortetracycline, Oxytetracycline, Nitrofurans, Olaquindox, Furazolidone and Sulphas.

- No anticoccidial drug should be given at any time during the bird's life.

- The use of antibiotic growth promoters, Gram + and Gram – (with exception of those listed above), probiotics, prebiotics, competitive exclusion products, etc. do not interfere with the activity of the vaccine. These products have a positive effect on the program as they contribute to maintain intestinal integrity, mainly during the phase of immunity development and in the periods of highest exposure to enteric challenges (feed restriction).

- Before using any other feed additive, ask the Schering-Plough Animal Health team for further information.

Monitoring and management of vaccine uptake and immunity development

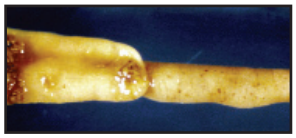
- It should always be remembered that the control of coccidiosis through vaccination is a biological process that requires controlled exposure to live organisms. **Coccivac®-D** vaccine induces mild, early and predictable lesions, essential for the development of immunity against coccidiosis. The use of any anticoccidial drug, even amprolium, should therefore be avoided in birds vaccinated with **Coccivac®-D** vaccine.

The following procedures were developed by the Schering-Plough Animal Health Technical Services Team to establish monitoring standards as the best way to control the vaccine uptake and coccidia recycling in the house, and ensure a successful immunization process:

1. Monitoring by lesion score

When birds are immunized against coccidiosis, it is expected that at least 65% will not present visible lesions during the peak multiplication of the vaccine (between 14 and 24 days of age):

The peak of *Eimeria acervulina* lesions takes place between 14 and 22 days, when up to 30% of the birds are expected to have lesion scores of +1.



The peak of *Eimeria maxima* lesions takes place between 18 and 24 days, when a small number of birds (a maximum of 15%) will have score +1, but some birds may have +2. Since gross lesions for *E. maxima* are unreliable, microscopic observation of oocysts from intestinal scrapings is the best way to assess the level of lesions for this specie.

The peak of *Eimeria tenella* lesions takes place between 20 and 24 days, when a very small number of birds (less than 10%) is expected to have lesion scores of
+1 or +2.

1.1 Pre-starter monitoring: 10 days of age

Five birds (3 females and 2 males) per flock are necropsied. They are randomly chosen and should be representative (culled or sick birds are not included).

STANDARD:

- Less than 50% of the birds may have Grade +1 of *Eimeria acervulina*
- Less than 25% may have up to Grade +2
- No lesions caused by *Eimeria maxima* or *Eimeria tenella* should be found at all.

MEDICATION SHOULD BE GIVEN ONLY IF:

- More than 50% of the birds have Grade +2 or greater of *Eimeria acervulina*

or

- Severe lesions caused by *Eimeria tenella* or *Eimeria maxima* are evident
  - In this case, treatment with 1/4 dose of amprolium/1,000 liters of water/48 hours (2 days, day 10 and day 11) should be given.
  - If mild coccidiosis lesions are found and are clearly causing a negative impact on feed consumption, a 2 day-treatment with liquid vitamins (mainly A and C) should be given.
  - If coccidiosis lesions requiring medication are found often in a monitored farm:
    - The operational procedures of vaccine administration should be checked;
    - The management procedures, as well as pen opening, should be checked and adjusted accordingly. Often problems can be controlled by increasing the space provided to the birds between 7 and 9 days of age.

1.2 Starter monitoring: 16 days of age

If the lesions are within the expected patterns at 10 days of age, the second monitoring should take place at 16 days of age. The mortality curve should be monitored and only the dead birds are necropsied between 15 and 16 days.

MEDICATION SHOULD BE GIVEN ONLY IF:

- There is a significant alteration in the mortality curve
  and
- If ceca full of blood are found during necropsy of birds found dead
  or
- Blood droppings are present in the litter
  or
- The flock has a high morbidity
  and
- No medication was given on day 10

    - In this case, treatment with 1/4 dose of amprolium/1,000 liters of water/48 hours (day 16 and day 17) should be given.

1.3 Growth monitoring: between 21 and 25 days of age

This is the most critical period, when the peak of reactions to vaccine occurs, the feed restriction skip-a-day program is started and the first selection takes place.

Five birds (3 females and 2 males) per flock are necropsied. They are randomly chosen and should be representative (culled or sick birds are not included).

STANDARD:

- Birds with lesion scores (degree and morbidity) within the standard presented in the monitoring section on pages 3-6

- Less than 5% of the birds do not go to the feeder when stimulated

- Less than 1% of the litter contains bloody droppings

MEDICATION SHOULD BE GIVEN ONLY IF:

- The lesion scores are not within the standard shown in the monitoring section on pages 3-6

- More than 5% of the birds do go to the feeder when stimulated

- More than 1% of the litter contains bloody droppings

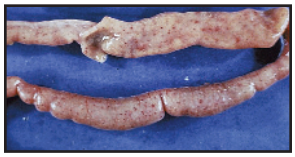
1.4 Final monitoring: between 8 and 10 weeks of age

Five birds (3 females and 2 males) per flock are necropsied. They are randomly chosen and should be representative (culled or sick birds are not included).

STANDARD:

- No *Eimeria* lesions should be found

- Observe the intestinal quality of the birds, as well as the incidence of leg problems (femur head necrosis)



At this age, no evident lesions caused by any *Eimeria* should be found, namely *Eimeria necatrix*.

If lesions are found in this stage, medication should be given according to the instructions on the coccidial product label.