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from the team at AgriHealth

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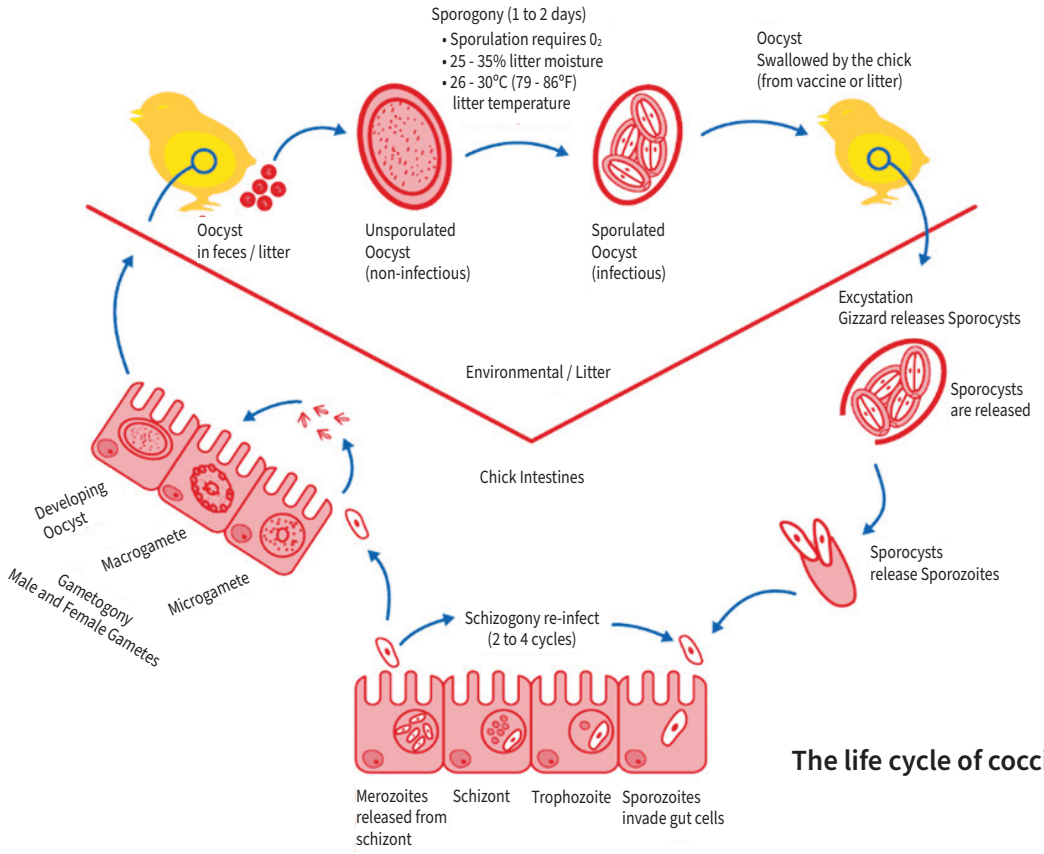
Coccidiosis Vaccination in Poultry:
Key Insights and Recommendations

Coccidiosis Control with Vaccination

Coccidiosis is a disease affecting the intestinal lining of chickens, caused by the protozoan parasite *Eimeria*. This parasite disrupts digestion and nutrient absorption, potentially leading to dehydration, diarrhoea, wet litter and heightened susceptibility to secondary infections. Coccidia are widespread in poultry farms, particularly in young birds, though chickens of any age without prior immunity are at risk. Effective prevention of coccidiosis has traditionally relied on anticoccidial medications (like ionophores). However, with the increasing issue of drug resistance in coccidia due to prolonged use of these medications, the role of coccidiosis vaccines has gained significant attention. Vaccination helps prevent coccidiosis by stimulating the bird's immune system, reducing the reliance on drugs, improving the effectiveness of anticoccidials (restoration of sensitivity), as well as flock health and performance.

Understanding the Eimeria Life Cycle and Vaccine Effectiveness

Understanding the *Eimeria* life cycle is crucial for vaccine success. Chickens become infected by ingesting sporulated oocysts, which develop and replicate in the intestine, eventually shedding oocysts into the faeces. The oocysts sporulate in the litter under proper conditions (moisture, temperature, and oxygen), ready to infect another bird. For the vaccine to be effective, chicks need to experience multiple cycles of the parasite to develop immunity. This cycling process can take 3-4 consecutive cycles,each typically spanning 5-7 days. Early exposure and proper environmental conditions are key to ensuring successful vaccine-induced immunity.

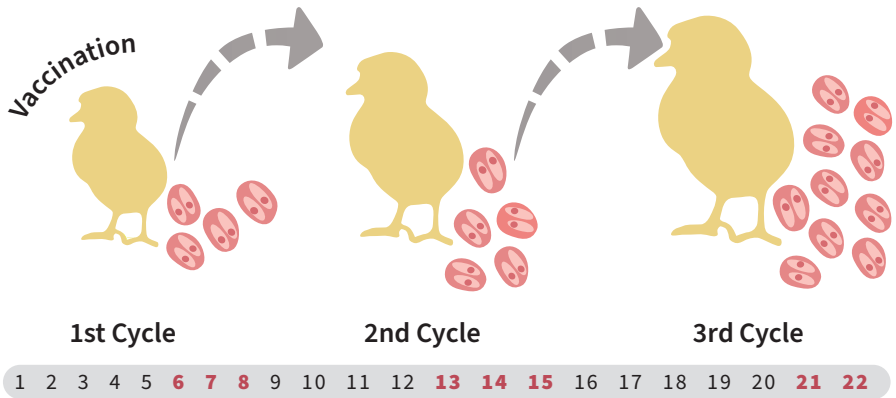


The life cycle of coccidia

Bio-Shuttle and Restoration of Sensitivity of Coccidiosis Control

In poultry coccidiosis control, both bio-shuttle and restoration of sensitivity are strategies aimed at managing the parasite *Eimeria* while maintaining the effectiveness of anticoccidial treatments. The bio-shuttle program combines coccidiosis vaccination and the later use of anticoccidial drugs. Initially, chicks are vaccinated with a coccidiosis vaccine, which primes their immune system, and later, anticoccidial agents are introduced to control the coccidia population, helping to prevent outbreaks.

On the other hand, restoration of sensitivity focuses on reversing the development of resistance to anticoccidial drugs. Over time, repetitive use of these drugs can lead to resistance, reducing their effectiveness. By integrating vaccines into the coccidiosis control program, the environment is



Increase in immunity with repeated recycling

seeded with susceptible (vaccine) strains of *Eimeria* that will cycle through the chicks . While the bio-shuttle involves a dual approach of vaccination and medication, restoration of sensitivity emphasizes the role of vaccination in restoring the susceptibility of coccidia population to anticoccidials.

Types of Coccidiosis Vaccines: Attenuated and Non-Attenuated

There are different commercially available vaccines, most of which are based on suspensions of live (viable) sporulated oocysts. These vaccines can vary in the content of coccidia species, the number of oocysts, and the pathogenicity of the strains.

Coccidiosis vaccines can be derived from either non-attenuated or selected precocious (attenuated) strains. Precocious strains cycle faster and are less pathogenic, which makes them safer for the birds. However, they are also less prolific than non-attenuated strains, which means they may stimulate a weaker immune response. Non-attenuated strains, on the other hand, are more pathogenic and prolific, leading to a stronger immune response but posing a greater risk of clinical coccidiosis, especially before immunity is fully established.

Best Practices for Vaccine Administration

Vaccination typically occurs at the hatchery, either via spray, gel droplets (which are orally ingested as chicks preen it from each other's coat) or eye drops. It can also be administered on farm during the bird's first two weeks of age, either through the water system or sprayed on the birds. Following vaccination, it's essential to ensure the birds cycle the oocysts properly to build immunity. This requires optimal brooding conditions, including temperature, humidity, and space management.

Factors Affecting Vaccine Success

Several factors can impact the effectiveness of a coccidiosis vaccination program

Vaccine handling: Coccidiosis vaccines should never be frozen and must be mixed and distributed uniformly to ensure all chicks are exposed to the oocysts.

Brooding and environmental management: Chicks require specific conditions for proper intestinal development and cycling. Adjusting stocking density and controlling litter moisture and temperature are crucial.

Immunosuppressive conditions: Diseases and stress can compromise the bird's immune system, preventing the development of proper immunity against coccidiosis.

Nutrition and environmental challenges: Factors like mycotoxins in feed, poor litter conditions, or inadequate ventilation can negatively affect vaccine response.

Monitoring

Regular evaluation of chicks during their early weeks is essential to monitor the vaccine's effectiveness. This can involve clinical observations, necropsy, and faecal analysis. If immunity isn't developing as expected, additional measures such as revaccination may be necessary.

While coccidiosis vaccines are effective, there may still be instances where an outbreak of disease occurs. In these cases, medications like amprolium can help control the infection. However, early treatment or improper use of anticoccidials can hinder the development of immunity.

Key Points for Coccidiosis Vaccination

1. Vaccination Timing: Early vaccination at the hatchery is critical for initiating immunity. Ensure optimal vaccine application for uniform exposure.

2. Cycling Process: Coccidia need to cycle multiple times in the bird for full immunity. Conditions in the environment, such as litter moisture and temperature, are vital for proper cycling.

3. Brooding and Management: Providing adequate space, temperature control, and litter conditions during the first few weeks ensures proper immunity development.

4. Environmental and Health Considerations: Disease challenges, stress, poor air quality, and nutritional issues can affect the immune response to the vaccine.

5. Monitoring and Adjustments: Regular evaluations and timely revaccination are essential for ensuring effective immunity, particularly when environmental conditions are not ideal.

6. Avoid Interference: Do not use anticoccidial medications or products with anticoccidial properties during the first 3 weeks, as they can interfere with vaccine cycling and immunity.

7. Emergency Treatment: If immunity development fails, treatment with anticoccidials may be necessary, but should be done with care to avoid disrupting ongoing immunity.

By following these key practices, poultry producers can more effectively manage coccidiosis, reduce reliance on anticoccidial treatments, and restore sensitivity of *Eimeria* populations therefore ensuring healthier flocks and better overall performance.

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