Coccidiosis control in broiler breeders with the use of vaccines: part 2

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Optimal brooding practices are essential for proper intestinal development and also for proper oocyst sporulation, consumption and recycling. Chick brooding density needs to change as the birds grow to increase floor space as well as feeding and drinking space. However, releasing chicks too soon into areas where coccidia oocysts have not been shed can compromise the recycling and uniformity of the process and development of immunity.

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Management during the first few weeks of a chick's life is critical for intestinal development. Excellent management and proper environmental conditions include focusing on:

- Feed.
- Light.
- Air (temperature and RH).
- Water.
- Space (bird density and feeder and drinker space).
- Sanitation (biosecurity).

Partial house brooding is a common practice and a very effective way to achieve a suitable environment for chicks as well as the proper oocyst cycling. Brooding rings, brooding areas or partitions, in particular for broiler breeders, are used to control not just the stocking density, but also feeder and drinker space.

Controlling stocking density progressively during the first 3-4 weeks is an excellent way to influence litter humidity and temperature for optimal intestinal development, coccidia sporulation and cycling.

The stocking density during the brooding period needs to be adjusted based on particular housing and/or farm conditions (brooder type, brooding set-up, feeder and drinker type, house ventilation, litter humidity, and environmental temperature). Time of the year can also influence brooding conditions where countries with severe winter and summer seasons may need to make adjustments to brooding protocols.

If covering the brooding area with paper, and subsequently removing it, be sure to remove the paper before the chicks start shedding the vaccine oocysts (this usually starts five days after vaccination).

Removing the paper later than day four after vaccination might reduce proper exposure to the vaccine oocysts that were shed by the birds limiting the first recycling of oocysts. If using paper in the brooding area another option is to leave the paper to decompose in the litter.

Managing the litter moisture and temperature requires close attention and is essential to the proper development of coccidia immunity. Spraying water on the litter may be required if the litter material is too dry (< 25% litter moisture) or if the proposed stocking density is too low to support litter moisture.

Relative humidity is not a good indicator of litter moisture. Litter moisture can be checked using a handheld moisture meter or by simply picking up a handful of litter and subjectively assessing the moisture content. Squeeze a handful of litter and if it remains in a clump, it is too wet.

If the litter falls apart without clumping at all, it is too dry. Litter with the correct moisture content clumps slightly. Although less practical, litter moisture can also be measured using a drying oven. Samples of litter are collected, weighed, and allowed to dry in a drying oven for 12-24 hours at 50°C (120°F). Calculating the water loss determines the % litter moisture. As explained earlier, litter temperature and litter moisture are crucial for oocysts to sporulate, but environmental conditions are also essential to allow proper chicken development.

Vaccine cycling

- Optimal intestinal development is critical. Check for seven-day body weight and uniformity. Intestinal development needs to be maximised during the first week.
- Continued cycling is the key to long-lasting immunity without a clinical coccidiosis break, especially the first cycle and the transition from the first to the second cycle. Remember that for a few chickens, the first cycle occurs on the farm.
- Under certain conditions, such as very low humidity in the litter, revaccination in the field during the first week along with wetting the litter to increase litter humidity might be advised to guarantee the first cycle.
- As mentioned earlier, density can also influence the litter humidity and the rate of oocyst ingestion and sporulation. Always keep density in mind during the first 3-4 weeks of age when dealing with coccidiosis challenges.

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• Evaluate proper cycling in the field between 7-28 days with:
- Clinical and necropsy observations of chickens in the field (avoid choosing sick birds).
- Oocysts counts per gram of faeces by laboratory analysis. This evaluation could help to determine if cycling is taking place according to plan or if there is an issue with the coccidia replication or vaccine application at the hatchery.

• Be aware of anticoccidial properties of any supplement given to the chickens as it may impact the vaccine cycling and development of immunity.
• In ABF production programmes, the use of phytogenics, botanicals or plant extracts in the feed or water might be helpful in conjunction with the coccidiosis vaccine to try and modulate the cycling of the vaccine.

immunosuppressive conditions

• Disease challenges like IBD, Marek's and CAV can have a detrimental effect on the birds' immune system and development of immunity against coccidiosis. Immuno-suppression results in excessive replication of the coccidia, and breaks may occur later in life.
• Other situations can lead to immunosuppression including stress, mycotoxins, cold brooding temperature, lack of feeder space, or marginal nutrition.

Environmental challenges

Some environmental conditions have an impact on the birds' response to the vaccine:
• Environmental challenges caused by temperatures going above or below the recommendations during the first weeks .
• Air quality challenges such as high ammonia or dust in the house could negatively impact the early development of chicks and their response to the coccidiosis vaccine making the chicks susceptible to other diseases.
• Dry litter conditions prevent the sporulation of oocysts.
• Wet litter conditions increase sporulation, which can lead to excessive sporulation of oocysts and lesions resembling coccidiosis breaks.

Nutritional factors

• Mycotoxins in the feed can harm the birds' immune response resulting in a higher susceptibility to field challenges.
• Feed phase or feed form changes during the development of immunity to coccidia could cause intestinal changes in the birds and produce a suboptimal response to the vaccine.

Treatment

Although rare, sometimes birds may require treatment to control an outbreak. If and when the development of good immunity fails, birds may be at risk of a new coccidiosis outbreak if:
• Treatment is given too early before immunity builds (less than two weeks).
• A high dose of medication for more than two days is used eliminating the coccidia from cycling and compromising immunity.

Amprolium and Toltrazuril are among the medications being used to treat clinical coccidiosis outbreaks. In the past, sulpha medications have also been used as a treatment.

The use of anticoccidial medications or certain botanical products can interfere with the response to vaccination or the recycling of oocysts. Their use as part of a 'bio-shuttle programme' or a dual programme coccidiosis vaccine/botanical must be managed and closely monitored to avoid vaccine failures. It is essential to consult and follow the manufacturer's recommendations.

Key points

• Keep vaccine refrigerated (never frozen) and watch expiration dates closely.
• Administer vaccine in a way that ensures uniform distribution and equal exposure of all chicks to live oocysts. Hatchery administration is recommended. Allow chicks to dry and avoid exposing them to high air speeds or draughts.
• Provide birds with enough time and light intensity after vaccination to allow preening.
• Good brooding practices (environmental temperature and relative humidity), along with management of stocking density for the first 3-4 weeks of age will ensure that the recycling of oocysts is uninterrupted, allowing full immunity to be achieved early.
• Revaccination on the farm may be necessary when conditions are not optimal.
• Regular field evaluation of the birds between 7-28 days is recommended to determine or observe the post-vaccinal reaction and make adjustments to the brooding and management programme.
• When vaccinating for coccidiosis, the use of anticoccidial medications or any product with anticoccidial activity, especially during the first 3-4 weeks of life, is not recommended as it will interfere with the coccidia cycling and the development of early immunity.
• Check anticoccidial properties of any feed additive used in an ABF programme.
• Always contact your veterinarian to discuss any treatment if needed. ■