

# Coccidiosis in breeders – review of control options

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In poultry production it is imperative to continue searching for better tools to minimise the (economic) impact of disorders and diseases. Coccidiosis has been recognised for a long time as one of these diseases with a huge economic impact.

Nevertheless, in broilers it looks like poultry producers are still depending on the same tools, if not less, than decades ago.

Some 'newer' tools, i.e. vaccines have been developed and been introduced to the market, but at least in some areas of the world it seems that they have a limited market share only.

The main reasons are the high(er) cost price compared to anticoccidials and also the increased risk for enteric disorders and possible impaired performance.

## Valuable breeders

In breeders, these newer tools (vaccines) have found easier access. The main reason is that the high cost price, even for the more sophisticated (thus more expensive) attenuated vaccines is less prohibitive for use in more valuable breeders compared to broilers.

Indeed, in general, one can distinguish between two types of coccidiosis vaccines:

- Non-attenuated or wild strain vaccines. These vaccines are basically oocysts that are

### *E. maxima* lesions in intestines.

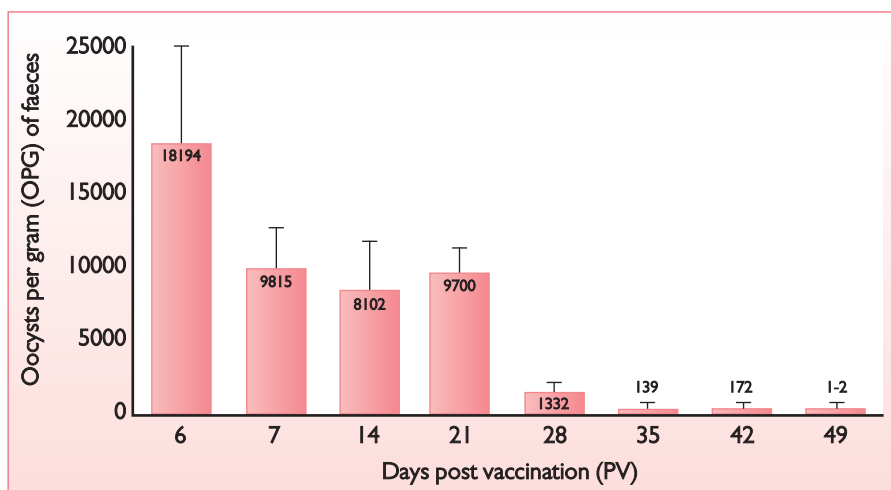


Fig. 1. Development of immunity following vaccination with Eimeriavax 4m.

being produced by normal pathogenic *Eimeria* spp. in birds. The oocysts are then collected, purified and packed. This type of vaccine cannot be authorised in the EU.

- Attenuated or (in most cases) precocious strain vaccines. This type of vaccine consists of strains with a known lower pathogenicity (virulence). The strains are precocious strains which have a shorter patent period because of a shorter asexual reproductive cycle. As a consequence, these strains cause far less tissue damage (in the bird) compared to wild strain parasites.

It is paramount that birds receiving an attenuated coccidiosis vaccine will suffer less from the detrimental destruction of the mucosal lining in the gastrointestinal tract compared to wild type vaccines. They will have less negative effect on performance and less risk for secondary infections such as necrotic enteritis.

## Understanding the history

But to understand why the use of attenuated vaccines in breeders has been consistently found to be justified, despite of the significant higher cost/bird, we have to go back in time.

In the late 1990s, when the first attenuated (precocious lines) vaccine was introduced to the market, other tools for coccidiosis control were available:

- Anticoccidials
- Non-attenuated type vaccines (not in all areas, for example not in the EU).

Nevertheless, poultry professionals have immediately seen the advantage of the attenuated vaccines.

In contrast to broilers, where parameters for 'performance' are rather clear and straightforward and the impact of coccidiosis on these parameters is almost mathematically measurable, it is difficult to assess in (rearing) breeders and layers what the economic damage of (subclinical) coccidiosis is.

In other words, it is far more difficult to estimate what the cost price of insufficient

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### Severe lesions caused by *E. tenella*.



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immunity is. However, a few features of attenuated vaccines have generally been accepted:

- Good immunity and low incidence of (coccidiosis) breakthroughs. Thus, low cost for coccidiosis therapy.

- Low incidence of necrotic enteritis. In particular, in the absence of AGP's (antimicrobial growth promoters), coccidiosis but also non-attenuated coccidiosis vaccines are easily provoking necrotic enteritis. With the precocious lines vaccines with less mucosal damage (as a triggering factor) there is an almost zero risk for necrotic enteritis.

- Probably as a consequence of the above mentioned phenomenon, the main param-

eter affected when using attenuated vaccines seems to be flock uniformity. Improved uniformity during rearing but also during production seems to be the main driver to use this type of vaccines.

### New option available

Eimeriavax 4m is an attenuated coccidiosis vaccine containing precocious lines of *E. acervulina*, *E. tenella*, *E. maxima* and *E. necatrix*; intended for use in chickens.

Depending on national authorisations, the vaccine can be administered from day 1 of life until 14 days of life.

Administration can be through spray on



***E. acervulina* lesions in intestines.**

feed, spray on chicks, drinking water and via eye-drop method.

Sound immunity is developed by means of multiplication of ingested oocysts and subsequently excretion and re-infection of newly formed oocysts.

With every coccidial cycling there will be an increase in immunity (Fig. 1) until a complete protective immunity has been established. As there will be a continuous contact with both vaccine and wild type parasites, there will be a lifelong immunity.

The precocious line parasites (oocysts) constituting Eimeriavax 4m have been selected for their full susceptibility to all prevention and therapeutic anticoccidials.

As a consequence, they will also repopulate the environment (poultry house) with sensitive (and obviously less virulent) strains. In this way, they will 'revitalise' the sensitivity to those anticoccidial compounds.

Eimeriavax 4m is produced in a FDA (USA), APVMA (Australia) and EU approved vaccine production facility. As the vaccine is produced in SPF (Specific Pathogen Free) chickens, this makes it compliant with the European Pharmacopeia.

### Conclusions

Coccidiosis in breeders is a potentially devastating disease. Also in its subclinical form, it can dramatically affect profitability of a breeder flock.

The global poultry sector has seen a constant shift from anticoccidials supplementation to coccidial vaccines, in order to protect birds.

Two categories of coccidial vaccines can be distinguished: the wild type strain vaccines and the precocious lines attenuated vaccines.

The latter category is known to provoke less mucosal damage and, as a consequence, bears a substantial lower risk for gut health problems such as necrotic enteritis and uniformity problems.

For economically valuable birds, such as breeders, it might be recommended to use this category of vaccine compared to non-attenuated ones or compared to anticoccidials.

Eimeriavax 4m contains precocious line strains of the four most prevalent and pathogenic *Eimeria* species in chickens. ■