

# Poultry coccidiosis: new challenges & possibilities for disease control

Poultry parasitic diseases generate huge losses in large-scale production and have a negative impact on production results. Avian coccidiosis is the most frequently diagnosed parasitosis, and its importance in breeding is very significant in terms of health and economy.

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We can distinguish many *Eimeria* species that show high host specificity. These parasites can attack broiler chickens, broiler breeders, hens, turkeys, waterfowl and other species of breeding birds.



The disease occurs in birds in two forms:

● **Subclinical form of coccidiosis.** This is characterised by indigestion, a reduction in daily weight gain and an increase in feed conversion.

This type of disease is most commonly reported when infested with less pathogenic *Eimeria* species (for example *Eimeria mitis* and *Eimeria praecox*) or when birds ingest fewer invasive oocysts;

● **Clinical form of coccidiosis.** In addition to the above-mentioned symptoms an increase in mortality in the flock is also noted.

The cause of this form of the disease is the consumption of a large amount of highly pathogenic coccidia oocysts.

The severity of the clinical course of the disease also depends on the immune status of the animal's organism, in particular on gut associated lymphoid tissue (GALT).

Common tools for controlling this disease include:

● **Preventive procedures.**

The use of disinfectants and burning out the floor, chemoprophylaxis in

the form of coccidiostats in feed as well as immunoprophylaxis in the form of vaccinations and/or herbal preparations in the drinking water or feed.

● **Intervention procedures – the use of antiparasitic drugs.**

Although coccidiosis has such a huge negative effect on large-scale production, and the poultry farm has a wide range of tools to control it, we have still not achieved sufficient protection of birds from its consequences.

Current animal welfare trends, driven by consumer expectations, lead to a pressure for significant reduction in coccidiostats in feed or even to an effort to run breeding systems completely devoid of chemotherapeutic agents and drugs in the production cycle.

**A search for new tools**

In view of the challenges presented above, it is necessary to search for new tools that will show a positive effect in the prevention and treatment of diseases in farmed poultry.

The active ingredients contained in specialised herbal preparations belong to the group of secondary plant metabolites and are referred to as phytoncides.

Their positive effect on the animal's organism has been proven in the course of many studies. Some of them have the ability to limit the multiplication of bacteria, others inhibit the replication of viruses, the development of fungi and parasites including coccidia.

A properly selected mixture of phytoncides can stimulate the secretion of digestive enzymes, reduce the level of cholesterol and glucose in the blood, and also activate the production and release of bile.

**Power of plants**

In the perspective of infectious diseases, an invaluable property of plant secondary metabolites is their ability to effectively stimulate the immune system.

It has been shown that selected active ingredients contained in herbs (for example allicin, echinacoside, eugenol, flavonoids,

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**Clinical Case No. 1**

I. **Flock:** Broiler chickens, Ross 308 line, one structure (hen house) – 40,000 birds, 25 days old.

II. **Clinical symptoms:** On the 25th day of life, worsening uniformity, wet litter, and undigested feed contents in faeces were found. There was no increase in daily mortality above the norm.

III. **Anatomopathological examination:** The pathological examination found:

- Scattered white plaque-like lesions in the duodenum (Fig. 1).
- Local ecchymoses within the intestinal epithelium (Fig. 2).
- Loosening the mucosa of the duodenum and jejunum.
- The mucous contents of the intestines.

IV. **Parasitological examination of the flock:** On the 25th day, the test sample showed: 91,000 oocysts/1 g of faeces.

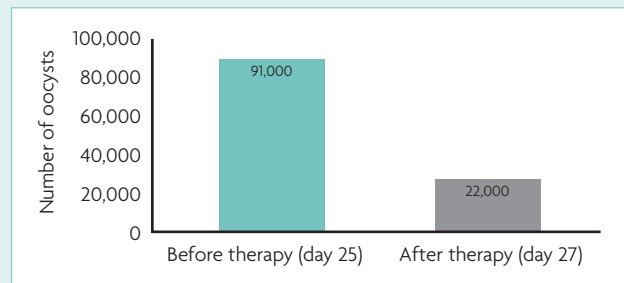
V. **Diagnosis:** Coccidiosis – subclinical form

VI. **Recommendations:** Biocox at a dose of 500ml/1000 litres of drinking water/12 hours, for three days (from 25-27 days).

VII. **Therapy effect:**

On the 27th day there was a marked reduction in indigestion (less undigested feed in faeces was observed), the flock was more even than before the start of therapy. The pathological examination did not reveal any changes characteristic of the invasion of *Eimeria* spp. On day 27, the parasitological examination revealed: 22,000 oocysts/1g of faeces. The flock has reached the EWW level of 429.5.

**Table 1. Number of oocysts in 1g of faeces.**



**Fig. 1. Scattered white plaque-like lesions in the duodenum.**



**Fig. 2. Local ecchymoses within the intestinal epithelium.**



Continued from page 7 etc) can significantly affect the humoral and cellular immunity of poultry.

With regard to coccidiosis, some phytoncides disintegrate calcium receptors in the cell membranes of

sporozoites, deform the entire protozoan cell, and damage the walls and membranes of Eimeria's developmental forms.

In addition to proper farm biosecurity and advanced immunoprophylaxis, it is the proper

functioning of the immune system that is of key importance in the context of limiting the use of chemotherapeutic agents and antibiotics in poultry farming.

The research and development department of BioPoint is responsible for conducting laboratory tests in the course of which the biocidal effectiveness of selected active substances or phytoncide mixtures against selected pathogens are assessed.

In addition to in vitro tests, an extremely important step in the assessment of the resulting complementary feeds and premixes is their use in commercial poultry breeding.

The most reliable confirmation of laboratory analyses is the achievement of positive and repeatable effects of therapy among birds kept in intensive farming. In this article, we present selected clinical cases of broiler

chicken coccidiosis in the course of which the Biocox, Biotix S and Coccilin V Plus preparations were used.

### Positive effect on health

The conducted laboratory studies and field tests show that the preparations of plant origin available today are more and more advanced in their composition and, most importantly, have a positive effect on the health of birds.

In the course of the field tests presented in this article, preparations of the BioPoint company were used, which contain, inter alia, secondary plant metabolites. Advanced mixtures of phytoncides, essential oils or other ingredients of plant origin may be a key element in the near future leading to a significant reduction in antibiotics in poultry production. ■

### Clinical Case No. 2

I. **Flock:** Broiler chickens, Ross 308, 25,000 birds, 26 days old.

II. **Clinical symptoms:** On the 26th day, slight flock diversification and an increased number in daily mortality to 40-45 birds per day were observed.

III. **Anatomopathological examination:** The pathological examination revealed changes in the duodenum:

- Loosening of the mucosa (Fig. 3).
- The presence of mucus in the intestinal contents and on the mucosa.
- Numerous white spots on the mucosa.
- Petechiae of varying severity (Fig. 4).

I. **Parasitological testing of faeces:** On the 26th day, 56,400 oocysts were found in 1g sample of faeces.

II. **Diagnosis:** Coccidiosis – clinical form (*E. acervulina*).

III. **Recommendations:** Due to the aggravated course of the disease, an intervention dose of Biocox was recommended.

Biocox at a dose of 1,000ml/1,000 litres of drinking water, in continuous administration for five days.

IV. **Effect:** After the use of Biocox, a reduction in the number of daily mortality (Fig. 5), uniformity of the flock, reduction in the intensity of anatomopathological changes within the duodenum, a significant reduction in the number of oocysts in 1g of faeces (Fig. 6) were observed.

Fig. 3. Loosening of the mucosa.



Fig. 4. Petechiae of varying severity.



Fig. 5. Daily mortality.

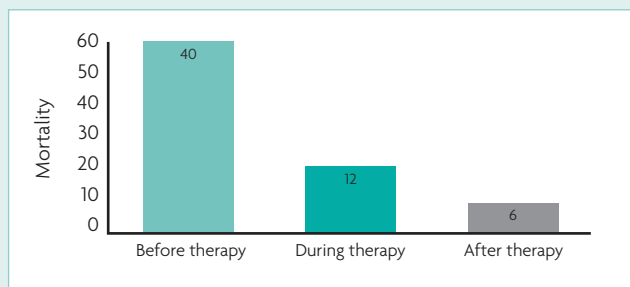
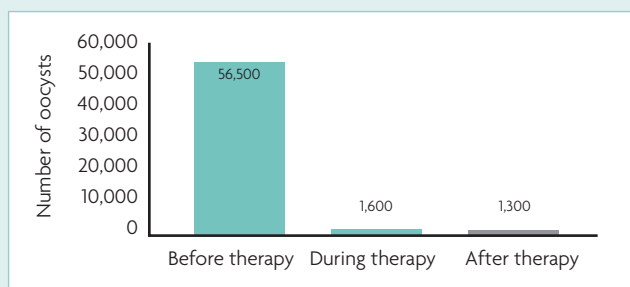


Fig. 6. Number of oocysts in 1g of faeces.



### Clinical Case No. 3

I. **Flock:** Broiler chickens, Ross 308, K1 – 40,000 birds, 28 days old.

II. **Clinical symptoms:** Between 25-28 days, on one site (K1) flock differentiation, diluted faeces with the presence of blood, apathy and feathering in birds were found. Moreover, the daily mortality rate in the flock suddenly increased.

III. **Anatomopathological examination:** The pathological examination revealed changes in the duodenum:

- Petechiae on the intestinal mucosa (Fig. 7).
- The presence of orange mucus in the jejunum.
- Distension of the caecum.
- Presence of clotted blood in the content of the caecum (Fig. 8).

V. **Recommendations:** Coccilin V Plus at a dose of 1,000ml/1,000L of drinking water/12 hours for five days. Biotix S 500ml/1,000L of drinking water/1,000L of drinking water/12 hours for five days.

VI. **Effect:** After the applied therapy, an improvement in the functioning of the flock was observed, the birds began to be more active and feed consumption increased. Daily mortality decreased to pre-disease normative levels. The number of oocysts in the faeces was significantly reduced in the parasitological examination of samples collected in the K1 facility.

Fig. 7. Petechiae on the intestinal mucosa.



Fig. 8. Presence of clotted blood in the content of the caecum.

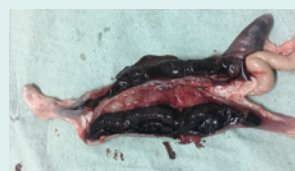


Fig. 9. Number of oocysts in 1g of faeces.

