



THE OREGANO PEOPLE

**DOSTO**FARM<sup>®</sup>



focus on  
**DOSTO**

## **Intestinal Health in Poultry**

Impact of natural DOSTO<sup>®</sup> Oregano oil on *Eimeria* challenged broilers

## Poultry Production Challenges and Potential Solutions

Intestinal health in poultry is one of the most important factors to get a high performance and sustainable production, being coccidiosis one of its biggest threats.

Coccidiosis is a parasitic disease affecting mainly the intestinal tract. In chicken it is caused by protozoan parasites of the genera *Eimeria*. Three *Eimeria* spp. most frequently affect broilers (*E. acervulina*, *E. maxima* and *E. tenella*) damaging their ability to absorb nutrients and resulting in retarded growth performance, impaired feed conversion efficiency, poor flock uniformity, depressed immunity, and sometimes increased mortality.

Since the 1950s anticoccidial drugs have been used to control the disease. However the increased occurrence of resistance against all anticoccidial drugs has forced the poultry industry to seek alternatives for coccidiosis prevention and control. Nowadays different options like vaccination and plant-derived products have been developed.

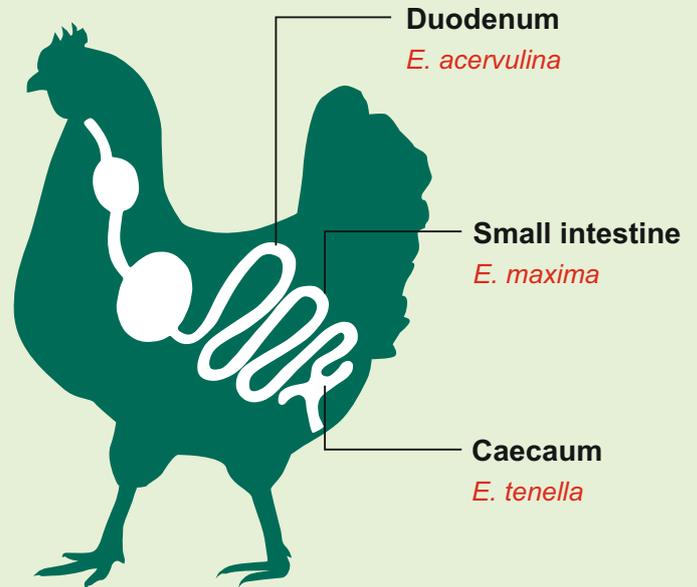


Abbildung 1: Intestine sections invaded by different *Eimeria* spp.

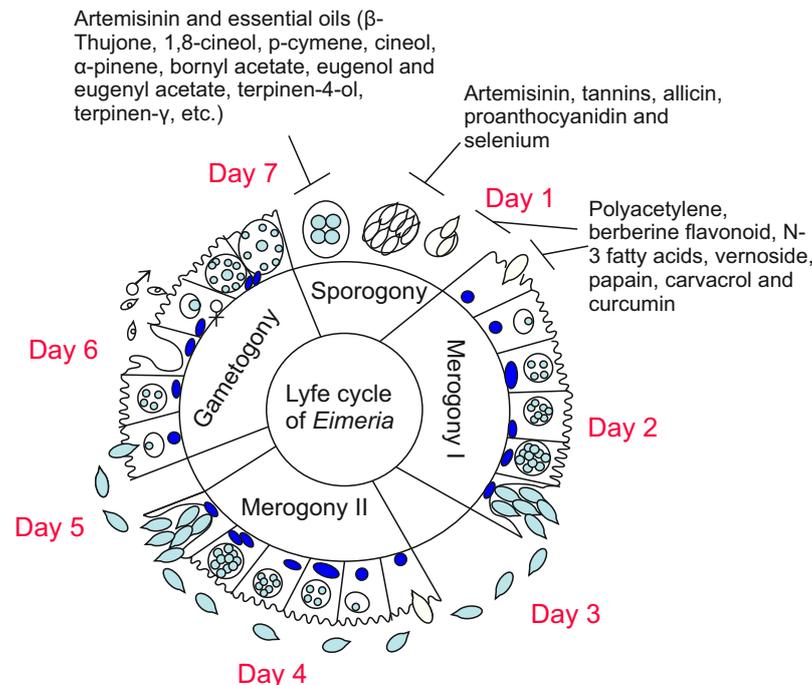


Figure 2: Plant compounds target different stages of the life cycle of *Eimeria* species (adapted from Muthamilselvan et al., 2016)

### Alternatives for traditional coccidiostat programs

The effect of phytobiotic compounds has been proved *in vitro* and *in vivo*. Phytocompounds from plants can inhibit the multiplication of *Eimeria*, expand the growth of beneficial bacteria, and/or boost immunity, leading to controlling *Eimeria* infection in the gut of poultry.

For instance, it has been assessed which of the different stages of the life cycle of *Eimeria* species the plant compounds target. In broiler, *E. acervulina*, *E. maxima* and *E. tenella* grow in different sections of the intestine (Figure 2). These parasites have a complex life cycle, which consists of three developmental stages and is completed in 4–7 days. As illustrated in Figure 2, the essential oils inhibit the growth of *Eimeria* species at sporogony and merogony stages.

## Effect of DOSTO® Oregano on *Eimeria* challenged Broiler Chickens

In order to understand of the potential role of DOSTO® Oregano oil in the formulation of solutions to coccidiosis, Dostofarm has performed three broiler challenge trials in collaboration with

different research centers. Summarized here are the results of these, together with other experiences collected over the years:

### 1. DOSTO® Oregano oil reduces oocyst shedding and lesions scores

- Birds fed DOSTO® Concentrate 500 at 75 mg/kg showed fewer oocyst in their feces at day 21 and 28 compared to the non-treated control and the coccidiostat group (Fig. 3).
- At inclusion levels of 75 mg of DOSTO® Concentrate 500 per kilo of feed the cecal lesion scores were statistically lower (Fig. 4).
- The duodenum and upper and lower mid-intestine lesion scores were numerical lower (Fig. 5) than the non-treated control.
- The anticoccidial effect of the essential oil of DOSTO® Oregano may also affect the effectivity of live vaccines at inclusion levels over 40 mg of DOSTO® Concentrate 500 per kilo, when applied simultaneously.

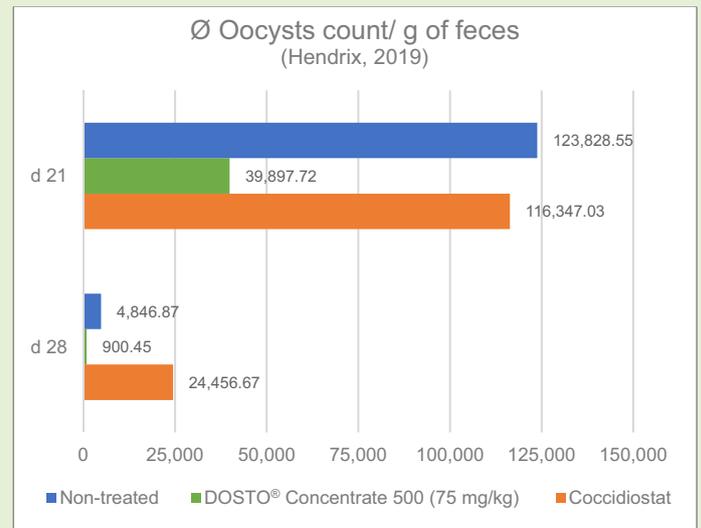


Figure 3: Average oocysts count, Days 21 and 28 (Hendrix, 2019)

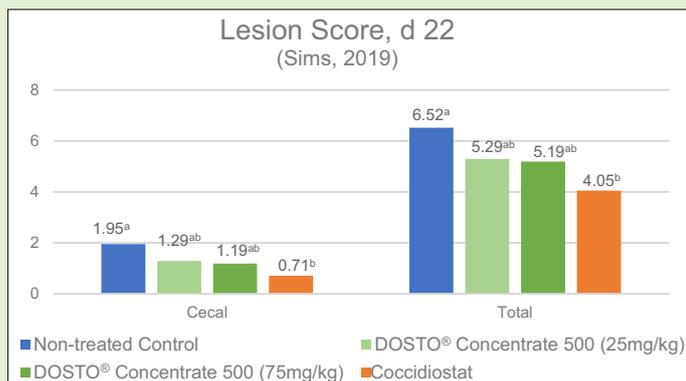


Figure 4: Coccidiosis Lesion Scores (0-4), Day 22 (Sims, 2019) (Means with different superscripts in one row (a, b) are significantly different at p<0.05)

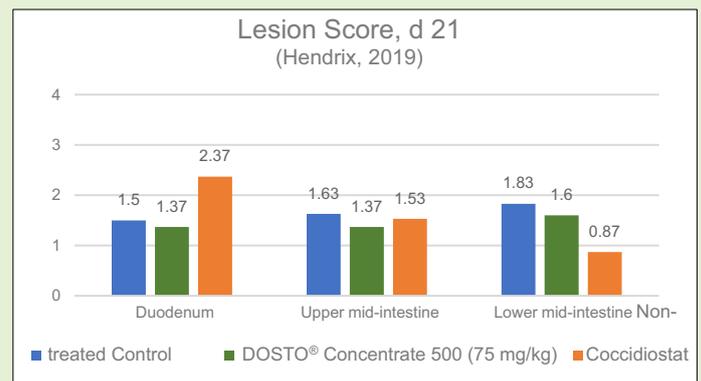


Figure 5: Coccidiosis Lesion Scores (0-4), Day 21 (Hendrix, 2019)

### 2. The anticoccidial effectivity of DOSTO® Oregano oil is dose-dependent

- Higher inclusions levels of 200 mg DOSTO® Concentrate 500/kg are not more effective in controlling the coccidiosis negative effects (Scheurer *et al.* 2013).



### 3. Lower dosages improve performance in *Eimeria* challenged birds

- In the trial performed by Hendrix (2019), challenged birds fed 75 mg/kg DOSTO® Concentrate 500 showed better weight gain and mortality adjusted feed conversions than the non-treated group, but couldn't reach the performance level of the coccidiostat (Fig. 6).

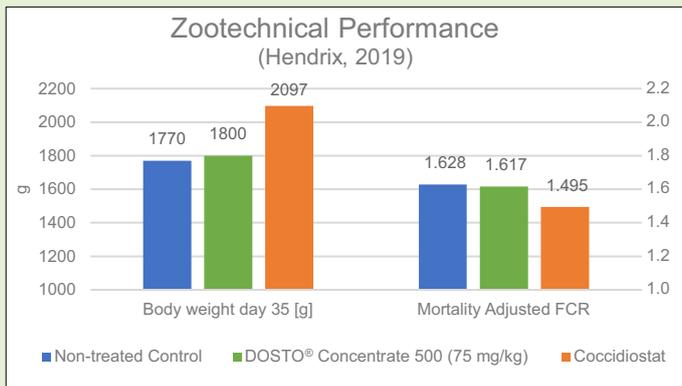


Figure 6: Body weight and mortality adjusted feed conversion (Hendrix, 2019)

- In a second trial, birds fed 25 mg/kg DOSTO® Concentrate 500 reached significantly better weight gain and mortality adjusted feed conversion rates (Fig. 7) on comparison to non-treated group and broiler fed a coccidiostat (Sims, 2019).

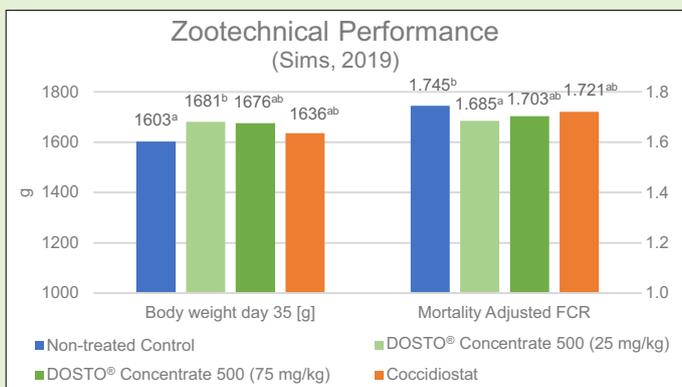


Figure 7: Body weight and mortality adjusted feed conversion (Sims, 2019) (Means with different superscripts in one row (a, b) are significantly different at p<0.05)



### Conclusions and future perspectives

The presented data confirms the anticoccidial effect of DOSTO® Concentrate 500. The essential oil of DOSTO® Oregano can contribute to reduce intestinal disorders in poultry thanks to its proven antimicrobial, immune stimulant and gut modulating properties.

Depending on the inclusion rate, DOSTO® Oregano can enhance performance and reduce lesion scores and lesions on *Eimeria* challenged broilers. DOSTO® Oregano may be a complementary tool to vaccines and an alternative to traditional coccidiostat programs.



## Practical case: DOSTO® Oregano in combination with a coccidiostat program improves performance, litter quality and footpad health

In collaboration with the University of Applied Science of Osnabrück, was tested a low inclusion rate of DOSTO® Oregano oil to improve the quality of the litter, foot pad health and growth performance in broiler chickens in a commercial farm in Lower Saxony (Germany).

Two houses and two consecutive fattening periods of 41 days were compared. Positive control birds received the basal diet with a coccidiostat from day 0-29. The experimental group received the basal diet with a coccidiostat from day 0-29 and DOSTO® Mineral<sup>4Green</sup> at 300 mg/kg (= 30 mg/kg DOSTO® Concentrate 500) from day 0-41.

### Results

#### Zootechnical Performance

- The group fed with coccidiostats from day 0-29 and DOSTO® Mineral<sup>4Green</sup> from day 0-41 had a higher precatch and final live weight and better feed conversion rate (FCR) than the control group only fed with coccidiostats from day 0-29 (Fig. 8).

#### Litter Quality and Foot Pad Health

- Supplementing the broiler feed with DOSTO® Mineral<sup>4Green</sup> resulted in drier litter, the difference was greater in the free areas (Fig. 9). This resulted in fewer foot pad lesions and hock burns (Fig. 10).

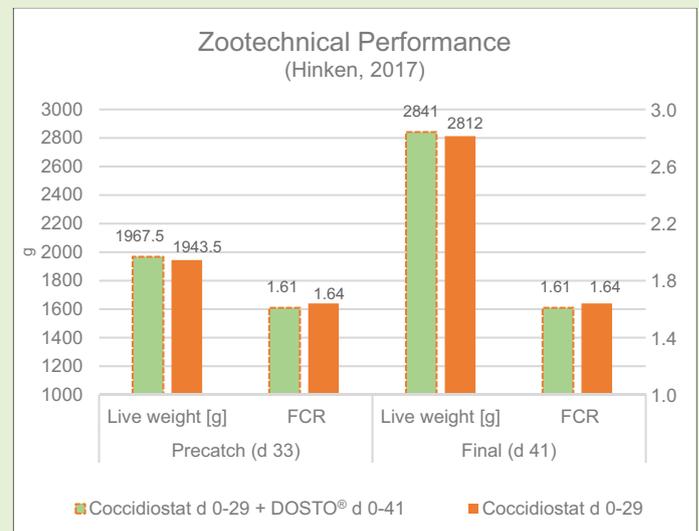


Figure 8: Precatch and final weight and FCR (Hincken, 2017)

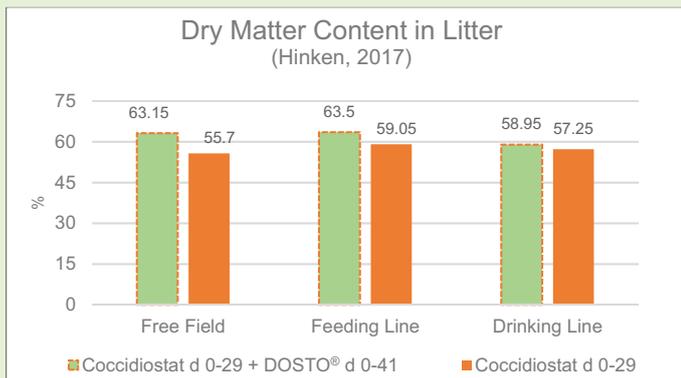


Figure 9: Dry matter content in litter (Hincken, 2017)

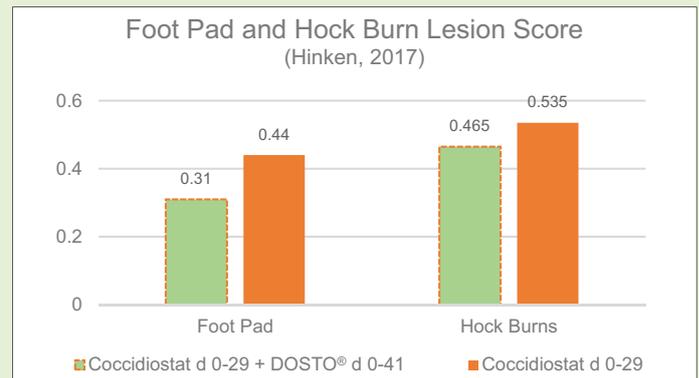


Figure 10: Foot pad and hock burn lesion score (Hincken, 2017)

### Conclusion

DOSTO® Mineral<sup>4Green</sup> together with the anticoccidial program resulted in drier litter and better performance. The essential oil of DOSTO® oregano stabilizes the intestinal flora. This translates into fewer gastrointestinal problems, drier litter and has a positive effect on the health of the footpads and joints.





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# DOSTO FARM®

*“We eat what we feed”*

Do you have questions about DOSTO® Oregano to support poultry intestinal health? Contact us!

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References are available on request.

