



MAXACTIVAT/Zn

ACTIVATED ZINC OXIDE

MAXACTIVAT/Zn is a new type of zinc oxide (ZnO) that is a more effective alternative to standard, inorganic ZnO products. MAXACTIVAT/Zn has been activated through a production process that makes the molecule more reactive when ingested by animals. It shows outstanding effects on the intestinal microbiota and the immune system of animals. For piglets, MAXACTIVAT/Zn even represents a possible alternative to the therapeutic use of high-dose zinc oxide.

ZINC – ESSENTIAL FOR LIFE

Zinc is an essential co-factor in more than 300 metabolic enzymes, and it is crucial for almost all metabolic processes in the animal. In addition, Zinc is involved in the synthesis and degradation of carbohydrates, fats, proteins, nucleic acid and the metabolism of other micronutrients. It stabilizes the molecular structure of cellular components and membranes, and it has a central role in immune system integrity.



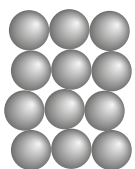
- Stabilizes microbiota and inhibits the attachment of *E. coli* to the gut wall
- Decreases the secretion of ions into the intestinal lumen, helping reduce diarrhea
- Provides anti-inflammatory benefits by reducing histamine levels

ENERGIZING THE ZINC OXIDE MOLECULE

PROVITA SUPPLEMENTS has succeeded in activating feed grade zinc oxide through a production process that modifies its functional properties, particle size, and surface area, causing an increase in the amount of stored internal

energy in the ZnO molecule. This, in turn, improves the physiochemical properties of MAXACTIVAT/Zn, making it more reactive when ingested by the animal. It's simply a much more usable and effective form of ZnO.

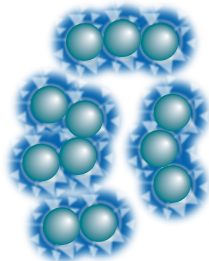
F1: Principle of mechanical activation



ZnO molecule
(feed grade)



eccentric
vibrating mill



MAXACTIVAT/Zn

ALTERNATIVE TO HIGH-DOSE ZINC SUPPLEMENTATION

When supplemented in high doses, conventional ZnO has been shown to help prevent diarrhea in weaned piglets because *E. coli* is reduced. However, the resulting risk of heavy metal contamination of the environment has led to a ban of high-dose dietary ZnO in piglet feed in the EU. Because of its activated nature, MAXACTIVAT/Zn has been proven to be a suitable alternative to high-dose ZnO. Research shows that when fed to weaned piglets at just 125 ppm, MAXACTIVAT/Zn has a better effect on decreasing *E. coli* when compared to standard ZnO fed at 1000 ppm.

PERFECT COMPONENTS. MAXIMUM RESULTS.

THE ALTERNATIVE TO HIGH-DOSE ZINC SUPPLEMENTATION

IN VITRO AND IN VIVO RESEARCH SHOW CONVINCING RESULTS

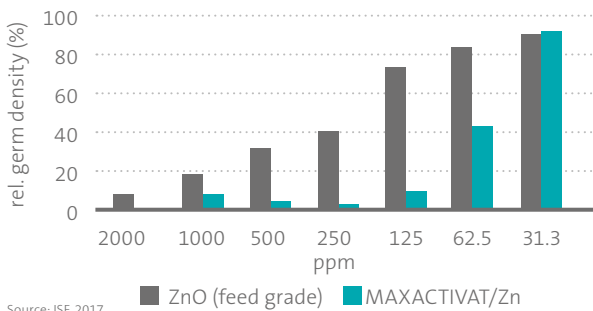
An in vitro experiment was used to understand the inhibitory effect of ZnO and MAXACTIVAT/Zn on *E. coli*. Figure 2 shows the relative germ density at different ZnO dosages in relation to the positive control after an incubation period of 24 hours. At a dosage of 125 ppm, MAXACTIVAT/Zn showed better inhibitory effects on the growth of *E. coli* as compared with a supplementation of 1000 ppm of conventional ZnO (feed-grade).

The effect of MAXACTIVAT/Zn was subsequently tested in vivo, where 200 weaned piglets were fed a basal diet

supplemented with 160 ppm ZnO (feed grade) for the control and 160 ppm ZnO MAXACTIVAT/Zn for the treatment group. The consistency of the feces was assessed daily according to a defined evaluation scheme. As shown in figure 3, the treatment group had a significantly lower number of animals with diarrhea. Also, the zootechnical parameters of the piglets showed clear differences. The daily weight gain in the treatment group was about 27% higher than the control group, and the feed conversion ratio was about 17% lower in the treatment than the control group.



F2: Density of *E. coli* germs after 24 hours incubation in dependency of ZnO source and dosage.

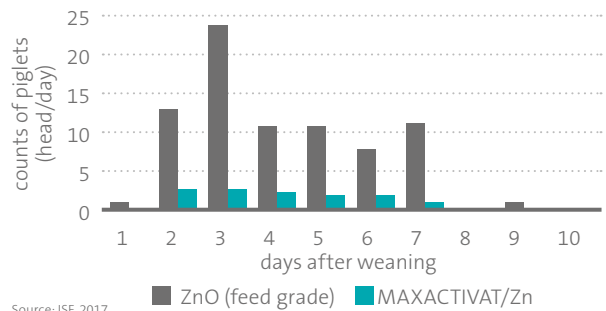


Source: ISF, 2017



F3: Counts of diarrhea evidence after weaning.

Trial Setup: n = 200, 42-day trial, 160 ppm zinc oxide



Source: ISF, 2017

IMPROVED IMMUNE STATUS INSUCKLING CALVES

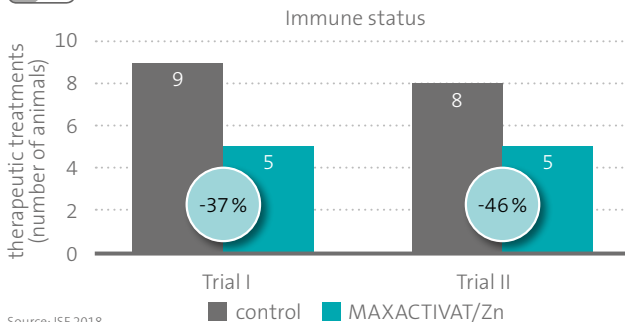
In two trials with 40 calves each, the effect of MAXACTIVAT/Zn was tested in the suckling phase in comparison to standard ZnO. The calves were allotted to two groups and fed a milk replacer supplemented with 100 ppm ZnO (feedgrade) for the control and 100 ppm ZnO MAXACTIVAT/Zn for the treatment group in trial I. In trial

II, the dosage was increased to 135 ppm ZnO per group. As shown in figure 4, treatment group calves proved to be significantly more robust, requiring fewer therapeutic treatments. In addition to significantly improved immune status, a positive effect was proven on zootechnical parameters, including daily weight gain and feed conversion.



F4: Effect on immune status, body weight gain and feed conversion in suckling calves.

Trial Setup: n = 40, 56-day trial, suckling phase, 100 ppm zinc oxide (trial I), 135 ppm zinc oxide (trial II)



Source: ISF 2018

