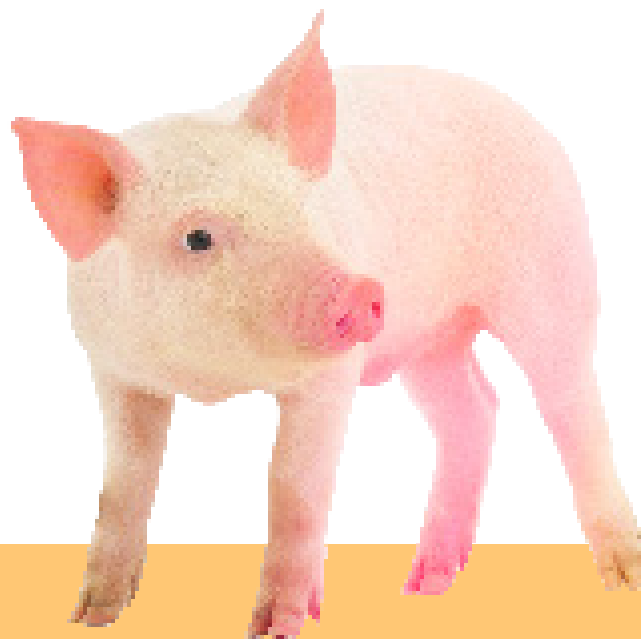




Capturing
nature's power

Enhancing performance and
productivity, naturally

Bioflavex



Find out the health benefits of our flavonoids in zinc oxide (ZnO) free piglet diets

Citrus flavonoids, as well as their metabolites, have multiple potential benefits for the intestinal barrier function, preventing diseases caused by its dysfunctionality. Due to their multiple local effects, citrus flavonoids have shown to generate systemic benefits, such as the improvement of the gut microbial dysbiosis, helping to regulate gut homeostasis and helping this way to alleviate systemic dysmetabolism.

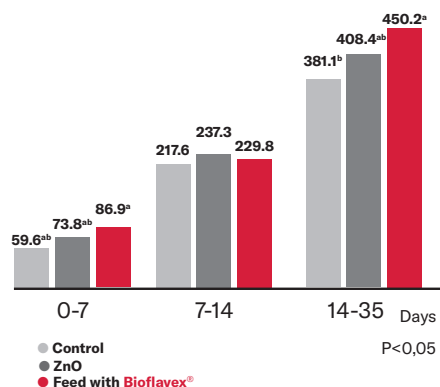
Bioflavex® addition to pigs' diet not only increases average daily gain (ADG) and body weight (BW) but also reduces Feed Conversion Rate (FCR).

Pigs fed ad libitum with the same pre-starter and starter basal diets.

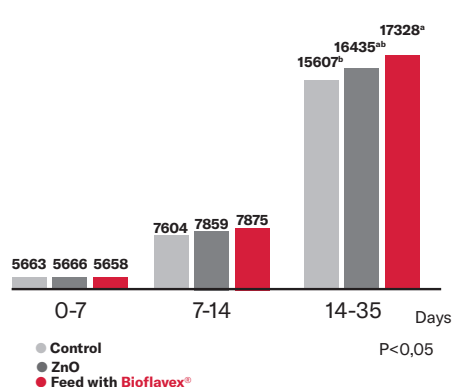
Group	pre starter & starter supplement
Control (CTR)	Sin ZnO ni AB
ZnO	ZnO (2,5 kg/TM) + Amoxicilina (300 g/TM)
Bioflavex® (BF)	Bioflavex® (300 g/TM) + Amoxicilina (300 g/TM)

Average Daily Gain, Body Weight and Feed Conversion Rate of piglets fed three different diets at 7, 14 and 35 days

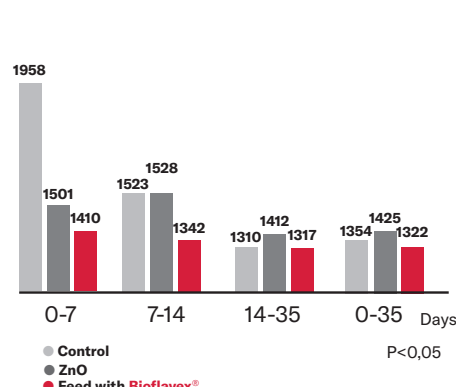
GMD (g)



PV (g)



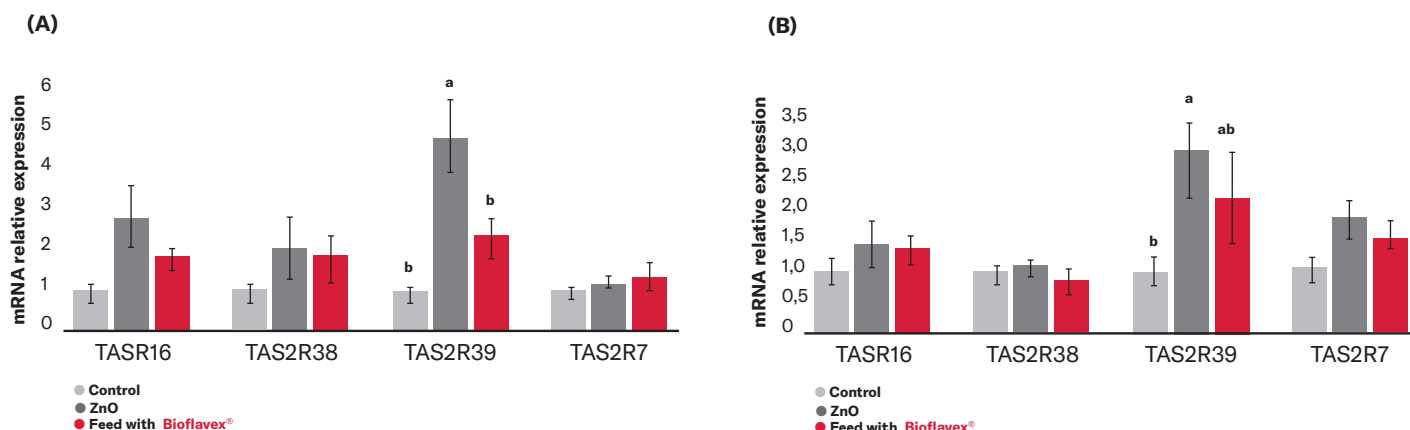
IC



Ileal histomorphology: villi length, ratio villi: crypt depth and mitosis h (µm)

	CTR	ZnO	BF	Valor P
Longitud vellosidades, µm	257,5	323,2	293	0,100
Ratio Longitud vellosidades/ Profundidad de cripta	1,36	1,92	1,76	0,061
Mitosis, 100 µm	0,22	0,35	0,33	0,098

Jejunum (A) and Ileum (B) gene expression of TAS2R of pigs fed the experimental diets



a, b: different superscripts denote statistical differences ($p < 0.05$).

Bioflavex® promotes a healthy environment in the distal part of the gut after weaning. In terms of intestinal health, it can be concluded that the animals fed the diet supplemented with **Bioflavex®**+amoxicillin show improved intestinal health status, mainly explained by a positive contribution of the genes related with barrier function and immune response. Furthermore, some nutrient transport related genes are also improved.

An increase in gene expression of TAS2R39 was observed on ZnO piglets compared to CTR and BF in jejunum but was only greater than CTR in ileum ($P < 0.01$).

Activation of TAS2R stimulates ghrelin secretion in the stomach, an orexigenic hormone that enhances gastrointestinal motility (Janssen et al 2011). Thus, ADFI in young pigs could be improved by the activation of TAS2R when supplemented with bitter molecules, positively affecting performance and gut health.

Based on the present results, gene TAS2R activation might be involved in the multifactorial mechanism of action of ZnO and BF, demonstrating that flavonoids are a promising alternative to the use of therapeutic ZnO in weaned pig diets.

In conclusion, **Bioflavex®** supplementation has allowed to remove the use of ZnO in both pre-starter and starter diets, while improving the productive performance in weaning piglets.

Using Bioflavex we can achieve:

- Very suitable for AGP- and ZnO- free feeding
- Modulates positively the immune system
- Improves intestinal morphology and microbiota
- Protects against oxidative stress
- Enhances gastrointestinal motility

Sources:

Solà-Oriol et al. 2018. Citrus flavonoids supplementation in weanling diets may improve piglet intestinal health and performance allowing a reduction in the use of antimicrobials during the nursery period.
Solà-Oriol et al. 2018. Citrus flavonoids supplementation in weanling diets improves pig gut health.
Paniagua et al. 2022. Citrus flavonoid and ZnO comparison at improving piglets' performance.

HTBA is a world leader in natural flavonoids and B12 derivatives that creates a measurable impact on well-being through the power of nature.

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