



**Crowne Plaza Northwood,  
Dublin  
25<sup>th</sup> - 27<sup>th</sup> May 2016**

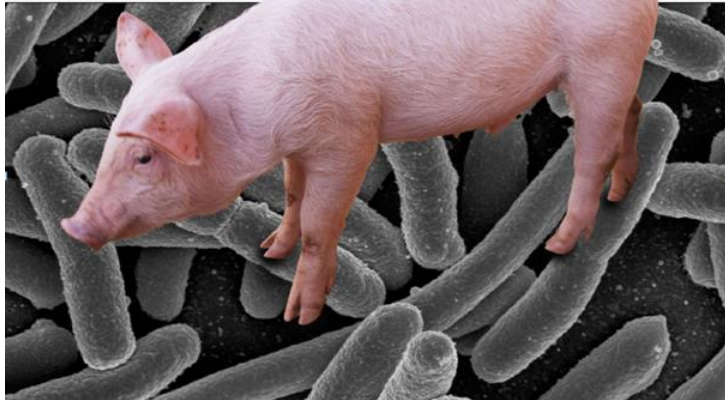


**A protected, nutritional  
supplement including benzoic  
acid, a potential alternative to ZnO**  
Roberto Barea, Technical Manager, Novus  
Europe SA/NV





# Avoiding Colibacillosis &



**Finding an suitable  
in-feed solution  
to ensure optimal  
piglet performance**



## Did you know the use of high levels of ZnO in piglet diets is associated with:

### 1) An increase in AB resistance

(Tetracycline, sulfonamide, quinolone, MRSA in nasal cavity)

### 2) The development of multi-resistant *E.coli* strains

- Already starts after 1w of application
- Related to close genetic proximity of genetic elements encoding for resistance (known for Zn-Tetracycline, Zn-MRSA)
- In enterobacteria located on plasmids
- Zn ions cause stress => ↑ plasmid transfer in bacteria



**Did you know the use of high levels of ZnO in piglet diets is associated with:**

**3) Reduced absorption other minerals (Ca, P, Cu, Fe)**

(Sandstrom, 2001)

**4) A decreased activity of phytase enzyme**

(Lizardo, 2004)

**5) A negative environmental impact**

- 2% of Zn is accumulated in the pig, rest excreted

(Dourmad & Jondreville, 2007)

- increase from 150 ppm to 2500 ppm: excretion ↑ with 16%)

## Trial description



Project in cooperation with Swine Research Company  
Location: 450 Commercial sow farm, Segovia, Spain

**Objective: To evaluate the zootechnical efficacy of a protected benzoic acid (PBA) in weaned piglets**

### **vs Zinc oxide**

Piglets: 216 male +female pigs

Breed: ACMC x Pietrain

Design: 2 nursery houses, 18 pens per house, 6 piglets/pen (3 males+3 females),  
12 pens (replicates)/treatment, 72 piglets/treatment

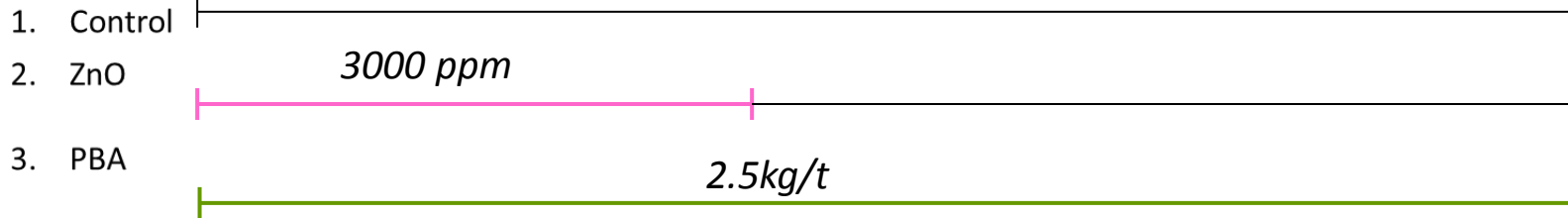
Diet: pre-starter & starter : mash feed based on corn, SBM , Barley  
no antibiotics, no probiotics

## Set up

Piglets weaned at 28 days of age  
Duration: 35 days after weaning



### Groups



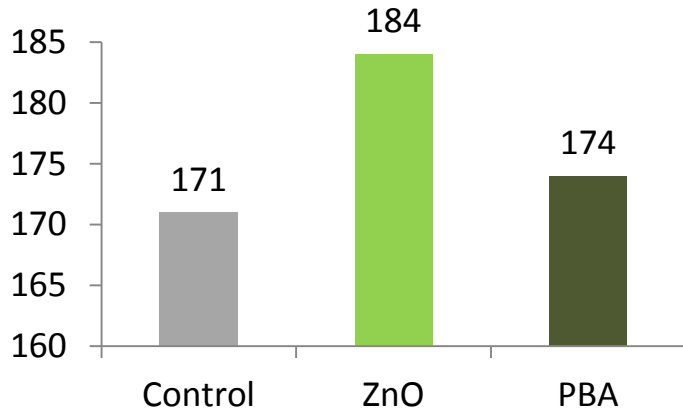
### Parameters measured:

- Mean piglet BW, ADG by treatment, at d0, d14 and d35 after weaning.
- Mean FCR/piglet based on avg. feed intake. (FI dead piglets taken into account while the piglet was present in the pen)

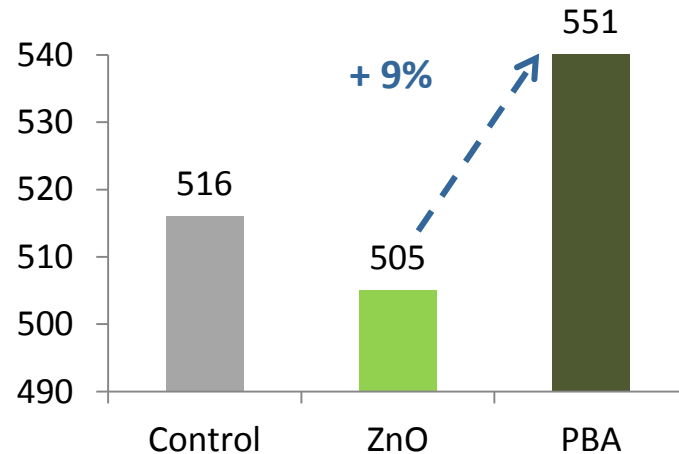
# Weight gain performance



ADG (g/piglet) d0-d14 after weaning (prestarter)



ADG (g/piglet) d14-d35 after weaning (starter) \* p=0.029

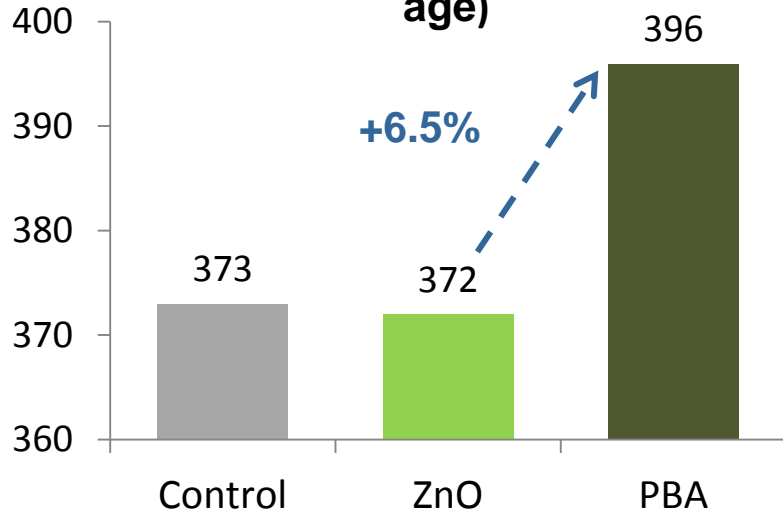


- ✓ ZnO showed effect only in prestarter phase-> faded out towards end starter period
- ✓ PBA gradually improved piglet performance to become significantly different from ZnO at end starter phase

# Overall results on weight gain



**Total ADG (g/piglet) d0-d35 (at d63 of age)**



Parameters	Control	ZnO	PBA	Diff. Vs ZnO	P-value
Body weight (d63)	20.95	20.93	<b>21.79</b>	<b>+840g/piglet</b>	0.204
ADG (g)	373	372	<b>396</b>	<b>+24g/piglet/day</b>	0.229

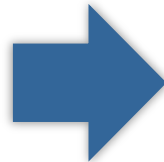
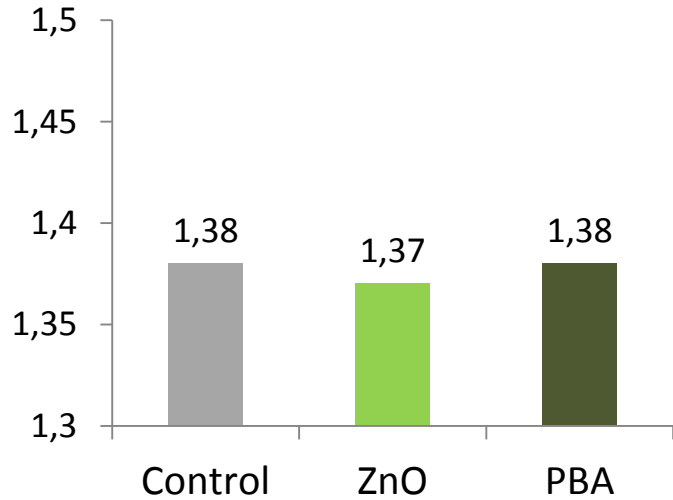
- ✓ **Piglets fed with the PBA solution during 5 weeks after weaning were heavier compared to those receiving ZnO for only 2 weeks**



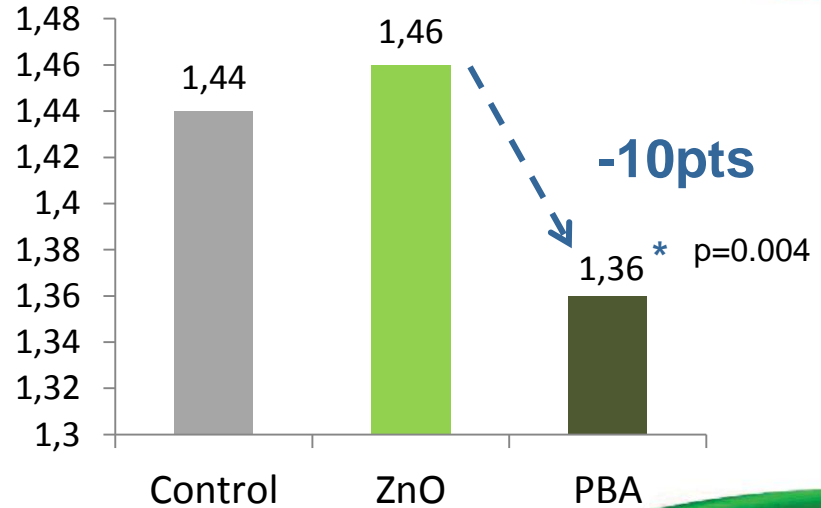
# Results on feed conversion



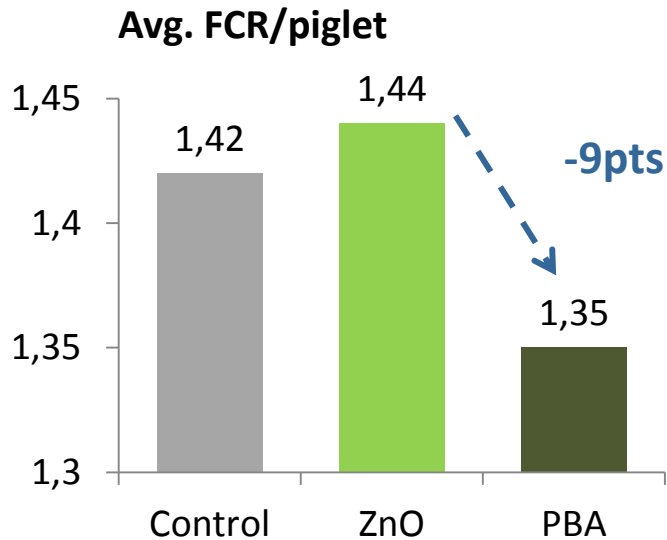
### Avg. FCR/piglet, d10-d14



### Avg. FCR/piglet, d14-d35



# Total impact on feed efficiency 5 weeks after weaning



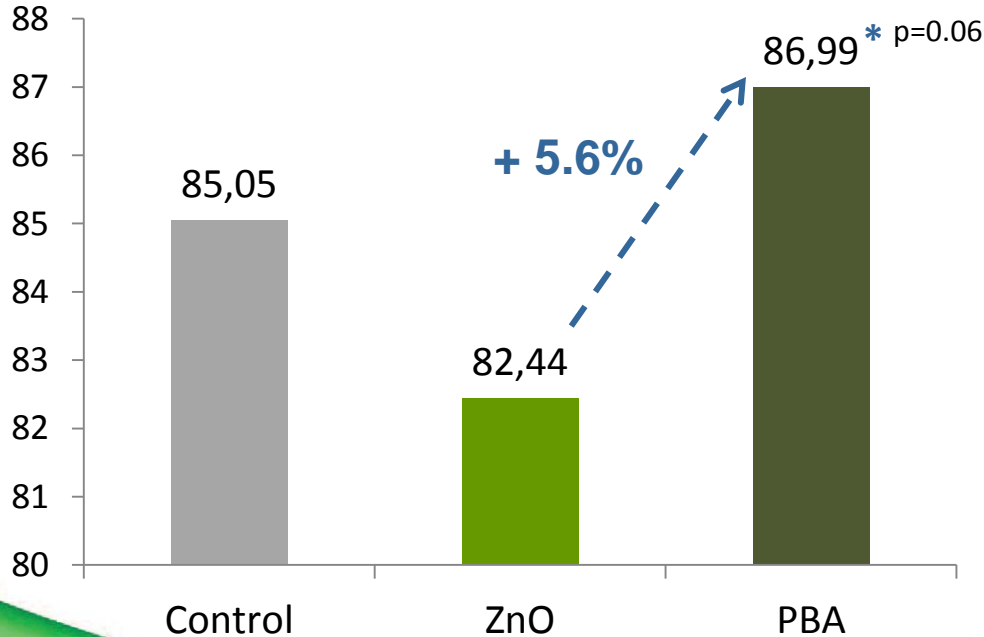
Parameters	Control	ZnO	PBA	Diff. Vs ZnO	P-value
Avg. FCR/piglet (d63)	1.42	1.44	<b>1.35</b>	<b>-9pts/piglet</b>	0.011

- ✓ **PBA fed pigs showed a lower FCR in average vs ZnO fed piglets**
- ✓ **Overall PBA significantly improved feed efficiency vs non-supplemented pigs (+5.5%)**

# Effect on piglet uniformity



Avg. piglet BW homogeneity, %



✓ Piglets fed PBA in the diet had more uniform bodyweights compared to non supplemented or ZnO fed piglets

# Summary of outcome



Under the experimental conditions that this experiment was conducted we can conclude:

- ✓ Feeding PBA to weaned piglets numerically increased their ADG & total BW (approx. +4% vs ZnO and control)
- ✓ PBA significantly improved FCR in the starter ( $p=0.004$ ) and in the total nursery period ( $p=0.011$ )
- ✓ PBA piglets showed to be the most uniform in bodyweight after the entire nursery period. Compared to ZnO, BW homogeneity increased with 5.6% ( $p=0.06$ )
- ✓ No significant differences were seen with the ZnO supplementation at 3000 ppm during the prestarter phase on productive performance during the nursery period vs control piglets
- ✓ Mortality was not affected by the experimental products supplementation.

# Conclusions



Supplementing the diet of weaned piglets standard with a protected in-feed solution based on benzoic acid,

**can be an efficient potential alternative program to high levels of ZnO in the diet\***

**to ensure an optimal piglet performance for maintaining a high pig production profitability while improving the environmental footprint**

*\*depending on occurring gut health challenges, nutritional conditions and overall management of the farm*

Thank you!

