



# Benzocal-50

( Benzoic acid  $\geq$  50% )

**Innovative enteric-release preparation**  
Anti-secretory, Natural performance enhancer



- ① Intestinal targeted-release, 1:3 to replace regular benzoic acid.
- ② High stability, no package swelling, no corrosion of the equipment, no sublimation.
- ③ Odorless, unaffacting feed intake.
- ④ Target anti-secretory, alternative to acidifier.
- ⑤ Lower cost, better product performance.
- ⑥ A high efficiency alternative to AGPs.



Guangzhou Insighter Biotechnology Co., Ltd.

Room 610, Block D, International Business Incubator,  
Science Town, Guangzhou City, P.R.China, 510663.

Tel: +86-20-8211 1925

Fax: +86-20-3221 1129

E-mail: pengjst@hotmail.com

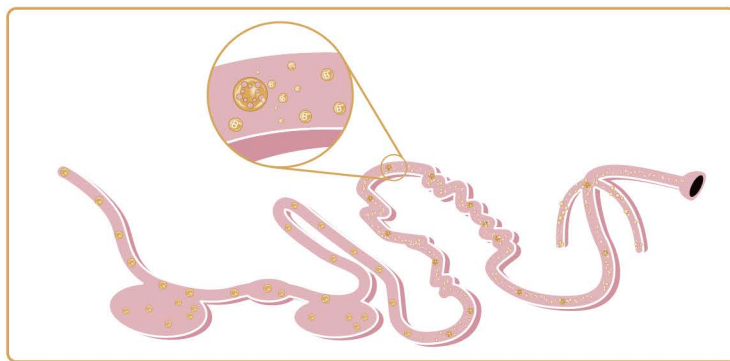
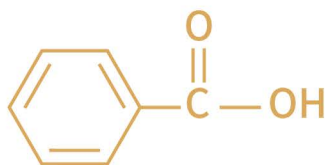
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**Insigher®**

*Solutions Of Gut Problems*

## 1. Main component of Benzocal-50

Enteric-release benzoic acid  $\geq 50\%$



Original ion exchange resin technology to ensure benzoic acid was released in the posterior part of small intestine.

## 2. Why does benzoic acid need enteric-release?

- ① The oral bioavailability of benzoic acid is  $> 80\%$ . In order to maintain high level to anti-pathogens in hindgut, the dosage of regular benzoic acid is too high.
- ② Regular benzoic acid react with  $\text{CaCO}_3$  which added in animal feed.
- ③ High dosage of regular benzoic acid irritates the digestive tract and reduce animal feed intake.

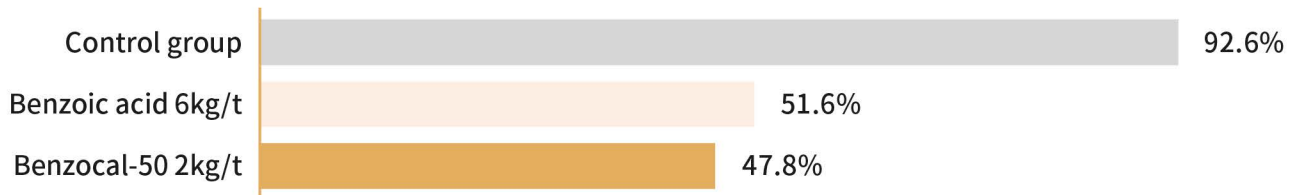
## 3. Characteristics of Benzocal-50

- ① Intestinal targeted-release, 1:3 to replace regular benzoic acid.
- ② High stability, no package swelling, no corrosion of the equipment, no sublimation.
- ③ Odorless, unaffecting feed intake.
- ④ Target anti-secretory, alternative to acidifier.
- ⑤ Lower cost, better product performance.
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Table 1. Comparison of the characteristics and performance of different benzoic acid product

Products	Industrial benzoic acid	Regular benzoic acid	Coated benzoic acid	Benzocal-50
Odor	Pungent	Smelly	Smelly	Odorless
Taste	Sour	Sour	Sour	Tasteless
Toxic impurities	High	Low	High	No
Caking	Yes	Small lumps	No	No (fluidity powder)
Reactivity	Acidic-Strong	Acidic-Strong	Acidic-Strong	Neutral-No
Stability	Sublimate	Sublimate	Sublimate	Stable
Corrosivity	Strong	Strong	Strong	No
Enteric release	No	No	No	Yes
Impact on palatability	Serious	Medium	Medium	No

## 4. Application effects of Benzocal-50



**Figure 1. Therapeutic effects of Benzocal-50 on diarrhea piglets (diarrhea rate, %)**

Note: Weaned piglet were fed with low zinc, low copper, no AGPs diets. After 5 days of feeding, 60 diarrhea piglets were selected and randomly divided into 3 treatment groups. The therapeutic effects were compared after 7 days.

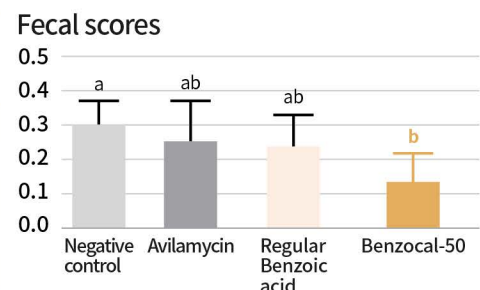
**Table 2. Dietary supplementation of Benzocal-50 and antibiotics on the growth performance in nursery pigs**

Items	Negative control (NC)	Antibiotics (AS)	Benzocal-50 (MA)	SEM	P-Value	
					vs. AS NC	vs. MA NC
Initial BW,kg	6.6	6.6	6.6	0.3	1.000	0.864
Final BW,kg	19.0	21.3	20.6	0.9	0.046	0.173
ADG,g/d	353	419	398	23	0.043	0.164
ADFI,g/d	515	606	576	31	0.046	0.176
G:F	0.66	0.69	0.70	0.02	0.330	0.295

Note: Animal Research Center, NCSU, U.S. August.2022;36 health nursery pigs (21-day-old), 3 treatments × 12 reps × 1 pigs; Negative control: basal diet (NRC2012); Antibiotics: basal diet + 2.5kg/ton of BMD; Benzocal-50: basal diet + 2 kg/ton (1-10 days) or 1.7 kg/ton (11-25 days) of Benzocal-50; Different superscript in the same row means significant differences ( $P < 0.05$ ).

**Table 3. Dietary supplementation of Benzocal-50 on the growth performance in Ross 308 broilers**

Items	Negative control	Avilamycin	Regular Benzoic Acid	Benzocal-50
Inclusion level -		50 ppm	1000 g/t	330 g/t
ADG, g	70.89	72.42	71.41	72.47
ADFI, g	112.57	112.07	112.37	113.21
F : G	1.588 <sup>a</sup>	1.548 <sup>b</sup>	1.574 <sup>ab</sup>	1.562 <sup>ab</sup>
Mortality, %	7.292	6.771	5.729	5.208



Note: University of Manitoba, Dec 1st 2021 -Jan 11th 2022. Floor pen. 4 treatments × 6 replicates × 32 birds; Different superscript in the same row means significant differences ( $P < 0.05$ ).

**Table 4. Dietary supplementation of Benzocal-50 on the Product performance and Egg Quality in Lohmann LSL Lite Layers**

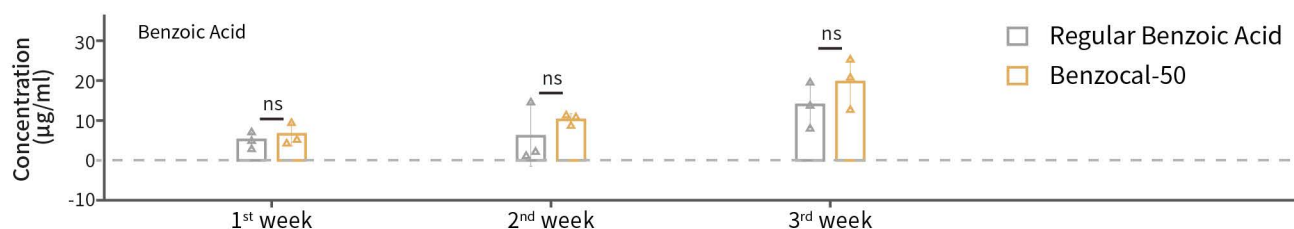
Items	HDEP, %	Feed intake, g/b/d	Egg weight, g/b/d	Egg mas, g/b/d	FCR, g/g
Control	95.4 <sup>b</sup>	102.5 <sup>b</sup>	57.3 <sup>c</sup>	54.7 <sup>b</sup>	1.878
BMD	96.7 <sup>a</sup>	106.1 <sup>a</sup>	58.8 <sup>a</sup>	56.8 <sup>a</sup>	1.865
Benzocal-50	96.9 <sup>a</sup>	107.8 <sup>a</sup>	58.2 <sup>b</sup>	56.4 <sup>a</sup>	1.911
SEM	0.375	1.209	0.137	0.238	0.023

Note: University of Guelph, September 2022 – January 2023; 3 treatment x 8 replicates x 30 birds, 12 weeks; Control: Basal diet without AGPs (NCR 1994); BMD: Control + 110g/ton BMD; Benzocal-50: Control + 330g/ton Benzocal-50; Different superscript in the same row means significant differences ( $P < 0.05$ ).

**Table 5. Comparison of Benzocal-50 or regular benzoic acid on the growth performance in Cherry Valley Ducks**

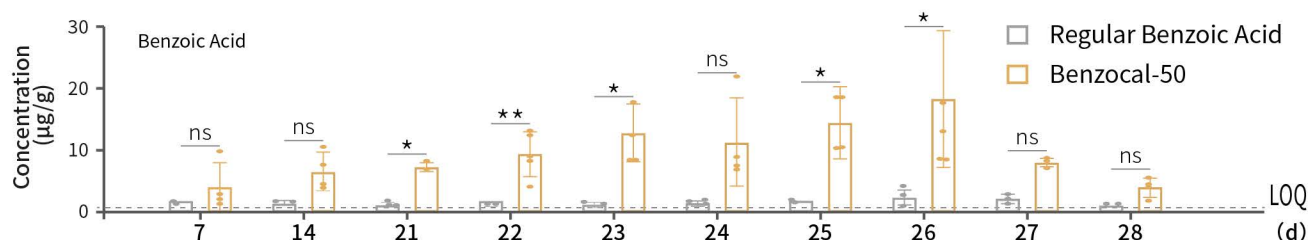
Items	Negative control	CTC	Benzocal-50	Regular Benzoic acid
ADFI, g	171.66±1.15 <sup>ab</sup>	173.64±1.30 <sup>a</sup>	166.26±1.44 <sup>c</sup>	168.14±2.22 <sup>b</sup>
ADG, g	96.67±0.56 <sup>c</sup>	99.56±0.60 <sup>b</sup>	100.01±1.35 <sup>b</sup>	95.75±1.36 <sup>c</sup>
Final Body Weight, Kg	4.01±0.02 <sup>c</sup>	4.13±0.02 <sup>b</sup>	4.15±0.05 <sup>b</sup>	3.98±0.06 <sup>c</sup>
F : G	1.82±0.02 <sup>a</sup>	1.77±0.01 <sup>b</sup>	1.70±0.01 <sup>d</sup>	1.78±0.02 <sup>ab</sup>
Survival Rate, %	96.21±2.17	98.48±0.96	96.97±1.52	96.21±1.40

Note: Jiangsu Academy of Agricultural Sciences, December 1<sup>st</sup> 2021 - January 11<sup>th</sup> 2022. 3 treatments × 6 replicates × 22 birds, 42 days of trail; Control: commercial no AGPs diet; CTC: control + 50mg/kg aureomycin; Benzocal-50: control+650ppm Benzocal-50 (1-21 days) or 330ppm Benzocal-50 (22-42days); Regular Benzoic acid: control+2000ppm Benzoic acid (1-21 days) or 1000ppm Benzoic acid (22-42days); Different superscript in the same row means significant differences ( $P < 0.05$ ).



**Figure 2. Dietary supplementation of Benzocal-50 or regular benzoic acid on the concentration of benzoic acid in digesta in nursery pigs**




Note: 18 piglets (10 kg of BW) were randomly assigned to Regular Benzoic acid group (5000ppm) and Benzocal-50 group (1670ppm). The feeding trail lasted for 3 weeks. On the 7<sup>th</sup>, 14<sup>th</sup> and 21<sup>th</sup> day of experiment, every treatment group sacrificed 3 pigs for sample collection to analysis the benzoic acid concentration in lower part (1/4) of small intestine.



**Figure 3. Dietary supplementation of Benzocal-50 or regular benzoic acid on the concentration of benzoic acid in digesta in broilers**

Note: 110 broilers (50 days) were randomly assigned to Regular Benzoic acid group (1000 ppm) and Benzocal-50 group (50 ppm). The feeding trail lasted for 3 weeks. On the 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>th</sup>, 22<sup>nd</sup>, 23<sup>rd</sup>, 24<sup>th</sup>, 25<sup>th</sup>, 26<sup>th</sup>, 27<sup>th</sup> and 28<sup>th</sup> day of experiment, every treatment group sacrificed 8 - 9 broilers for sample collection to analysis the benzoic acid concentration in lower part (1/4) of small intestine

## 5. Recommended dosage

Animal	Phase	Dosage (g/t)	Animal	Phase	Dosage (g/t)
 swine	Weaned piglet	500 - 2,000	 Chicken	Broiler	150 - 330
	Nursery	500 - 1,500		Laying hens	150 - 330
	Grower	500 - 1,000	 Duck	Meat duck	150 - 330
	Finisher	250 - 500		Laying duck	150 - 330

Note: Benzocal-50 1:3 to replace regular benzoic acid.



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Ad:Room 610, Block D, International Business Incubator, Science Town, Guangzhou City, P.R.China, 510663.

Tel: +86-20-82111925 | Fax: +86-20-32211129 | E-mail: pengist@hotmail.com | Website:www.insighterbt.com



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