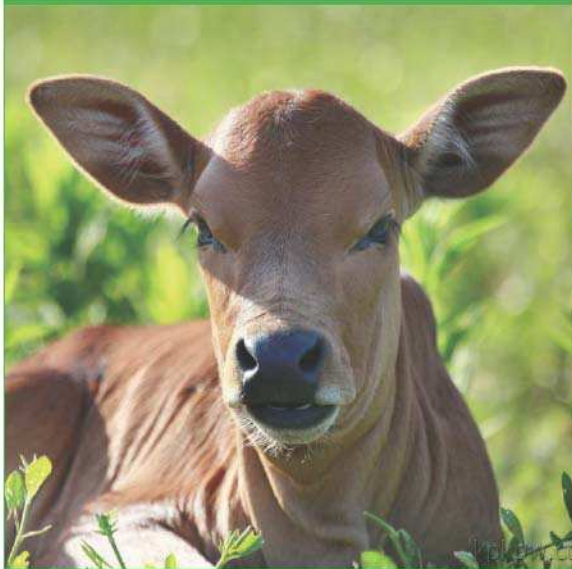




PerC S50 PerC P50

DOUBLE "50" CONTROLLED-RELEASE
SODIUM BUTYRATE



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Intestinal Health and Sodium Butyrate

PerC S50 & PerC P50 is the controlled-release preparation with guarantee of 50% sodium butyrate content, and its 50% functional components can be delivered to the colon, produced by Hunan Perfly Biotech Co., Ltd. According to the different digestive physiology characteristics of swine and poultry, the types of swine use and poultry use are designed respectively.

Composition

- Main ingredients: sodium butyrate, special coated materials
- Guaranteed analysis: 50%
 - PerC S50: Swine use
 - PerC P50: Poultry use

In modern intensive cultivation process, many factors will affect the animals' intestinal health: such as dietary antinutritional factors (NSP, soybean antigen); mycotoxins; bacteria, virus, parasites infection; stress and so on. They affect animals' intestinal health in different degrees (intestinal villus damage, intestinal micro-ecology damage), the direct performance reflected in the production process is pigs' diarrhea, feed feces and watery diarrhea, humid padding, odor of ammonia, high rate of feed to meat (eggs), short laying peak period, poor quality of eggs. Confronted with such complaints, many feed enterprises chose to increase the antibiotic dosage. However, long-term abused antibiotics in feed will result in antimicrobial resistance and antibiotic residues, and may cause a series of negative effects on livestock and poultry products. The new type of feed additive—sodium butyrate that was included into “feed additives species catalogue” by the Ministry of Agriculture in 2003 can partially substitute for antibiotics to play the roles of supplying energy for intestinal cells (repairing the damaged intestine), regulating the micro-ecology balance in gastrointestinal tract and preventing diarrhea, shaping feces, and improving poultry health and production performance. Compared with the mammals, poultry has special digestive system. Firstly, poultry digestive tract is relatively short, the residence time of digesta is short; secondly, poultry intestinal villus is more, renewal rate of epithelial cells is quick (time interval is 48-96 hours), the response to inflammation is quickly (the process is less than 12 hours,



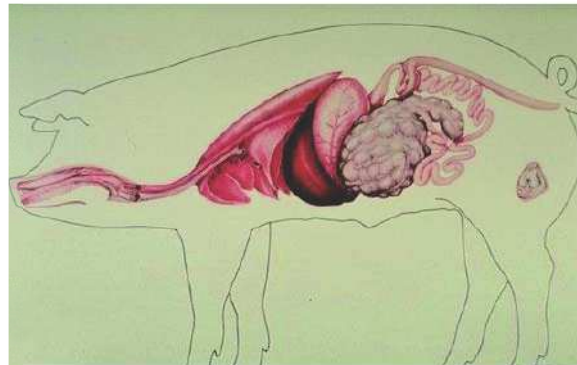
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mammals need 3-4 days). Therefore, the poultry's response to intestinal problems is more sensitive than mammals, and intestinal problems are likely to occur in the whole process. Healthy intestines not only can improve the digestion and absorption rate, but also can reduce the intestinal pathogenic bacteria invasion and diseases to improve the production performance and economic benefits.

Action Mechanism

The active ingredient of sodium butyrate is butyric acid, while the butyric acid is the main energy supply material in colon epithelial cells, and it has following main mechanisms:

- 1** Butyric acid ions rapidly supply energy for colon mucosal epithelial cells (it is the energy source preferred by intestinal cells. It provides 70% of the total energy of colon mucosae). At the same time, they quickly repair damaged intestinal epithelial cells and promote the growth of the intestinal villi to play the roles of maintaining intestinal health, inhibiting intestinal mucosal response to inflammation and the incidence of colitis.
- 2** Through reducing pH value or changing osmotic pressure in bacterial cells (by aggregating butyric acid ions), butyric acid ions destroy pathogens (*Salmonella*, *Escherichia Coli*, and *Clostridium*) to maintain the intestinal probiotics balance, which reduces the incidence of intestinal diseases.
- 3** Butyric acid ions improve the intestinal digestive enzyme activity to promote the digestion and absorption of feed.
- 4** Butyric acid ions regulate the expression of antibacterial peptide mRNA in colon epithelial cells to be beneficial to recovery from colitis, which decreases the incidence of intestinal diseases, leading to the decline in diarrhea rate.





Characteristics

1 Stable quality and no bad smell
Our sodium butyrate is coated by special fat materials with special technique. The technique can reduce sodium butyrate losses in processing and storage and reduce the stinky cheese of sodium butyrate, reducing the irritation and discomfort to workers.

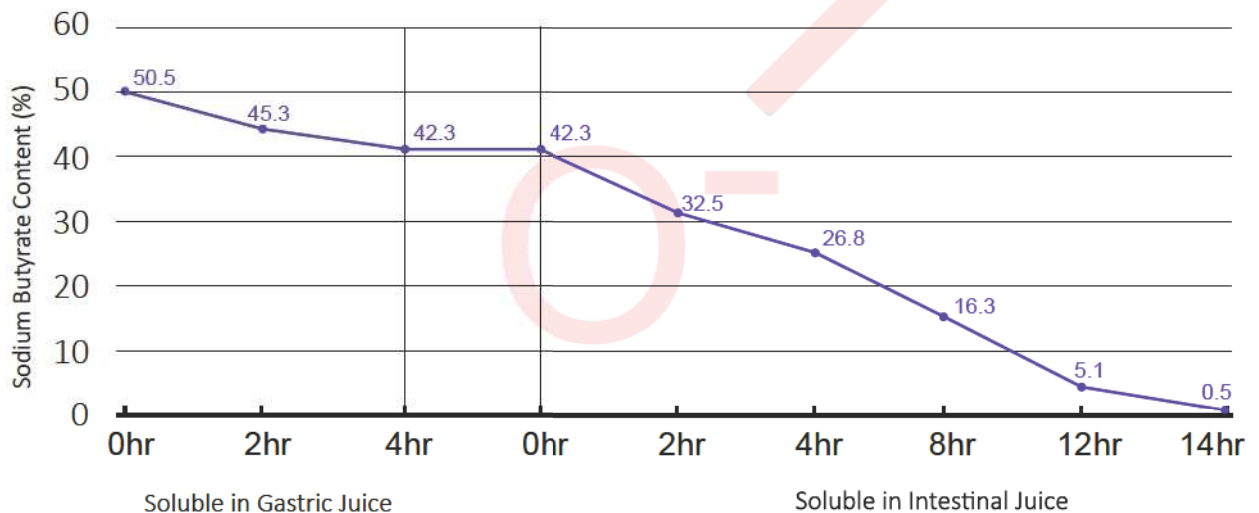
2 The excellent release performance
2.1 Targeting release in the colon: double “50” speciality (the content is 50%; the release rate is 50% in the colon).The release rate of our product can reach 50% in the colon. As a result, sodium butyrate provides energy for colonic epithelial cells

and prevents colitis and trophism diarrhea caused by colitis.

2.2 Sustained release in the small intestine
Sodium butyrate can be released sustainably in the small intestine, the release rate is 30%, as a result, it improves the intestinal tissue morphology; it maintains the intestinal probiotics balance; it promotes nutrition absorption function of small intestine and improves FCR.

2.3 This product is covered with special materials. It can effectively control the release of sodium butyrate according to poultry intestinal feature.

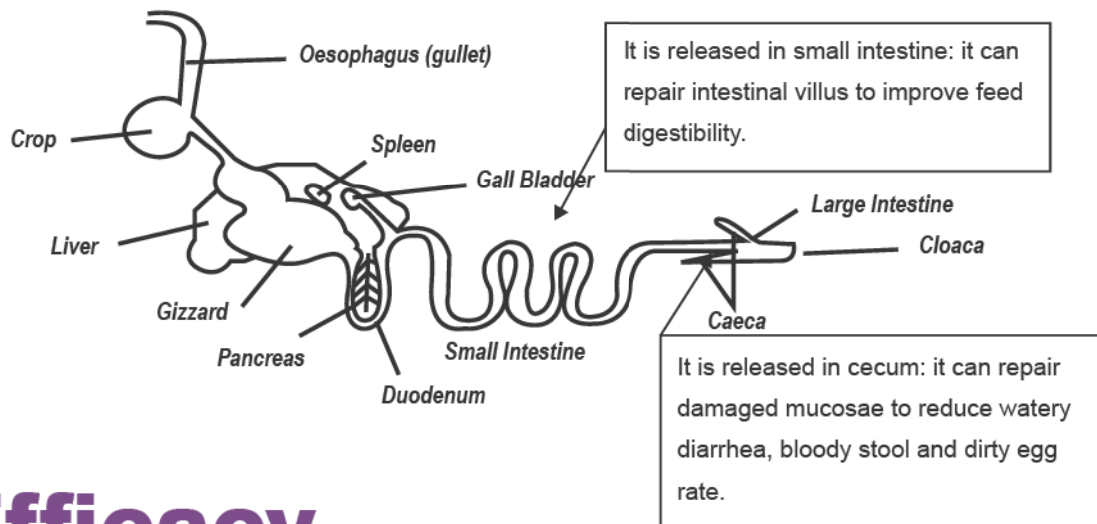
The Analysis of Dissolution Rate in Vitro





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The Picture of Alimentary Canal of Chicken



Efficacy

- 1** After the coating process, more than 50% of this product is disintegrated and released in the hindgut to supply energy for colon epithelial cells rapidly and repair the damaged mucosae, which effectively solves weaning piglets' digestion and absorption dysfunction caused by small intestinal villi atrophy, as a result, it relieves weaning stress.
- 2** After the coating process, this product can reach the hindgut to promote the growth and repair of small intestinal villus, which reduces death rate, feed feces, watery diarrhea (arid padding, less ammonia) and improves the uniformity of animals and the cleanliness of eggs .
- 3** This product not only plays the roles of antibacterial and sterilization, but also reduces the use of antibiotics to maintain intestinal health and to improve the body immunity.
- 4** This product improves animals feed intake, daily gain and feed conversion. It contributes to improve lactating performance of sows and weaning weight of piglets.
- 5** This product extends the peak laying period; it improves the laying rate, eggs weight, qualification rate of eggs and feed digestibility.
- 6** This product has the synergistic effect with coccidian vaccine and anti-coccidian drugs; it reduces the losses caused by coccidiosis.



Trial Effect

Application Effect on Piglets

90 Duroc×Landrace×Yorkshire crossbred weaning piglets (36-day-old (weaning at 26-day-old)) were selected for this trial. According to principle of condition similarity in daily age and average weight, they were randomly divided into two trial treatment groups (male and female piglets were in half, $P>0.05$), each trial treatment group had three replicate pens of 15 piglets each. Group I was the control group, Group II added 500g/T PerC S50 on the basis of basic diet, the test period was 30d.

Product Performance

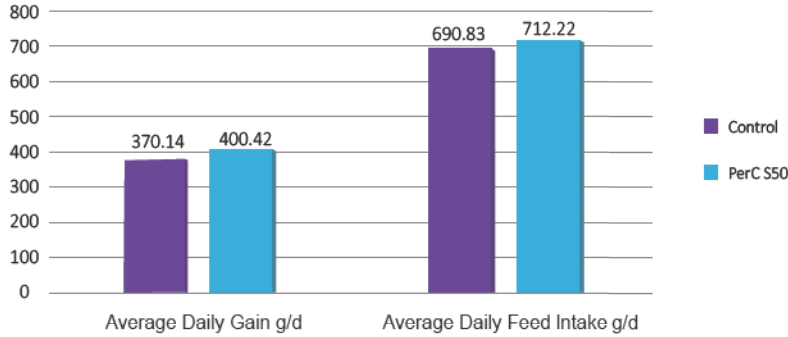
	Control	PerC S50
Initial Weight, kg/each	9.23±0.86	9.20±1.1
Final Weight, kg/each	20.33±2.01	21.21±1.89
Average Daily Gain, g/d	370.14±35.23	400.42±34.69
Average Daily Feed Intake, g/d	690.83±50.48	712.22±50.79
Feed Gain Ratio	1.87±0.16	1.78±0.17
Diarrhea Rate (%)	3.47±0.28	1.59±0.26

The table shows that the use of PerC S50 can make piglets' average daily gain reach 400.42 g/d, and PerC S50 add group is 8.2% higher than the control group. Average daily feed intake of PerC S50 add group is 3.1% higher than the control group, F/G of PerC S50 add group is 4.9% lower than the control group, and diarrhea rate of PerC S50 add group is 54.2% lower than the control group.

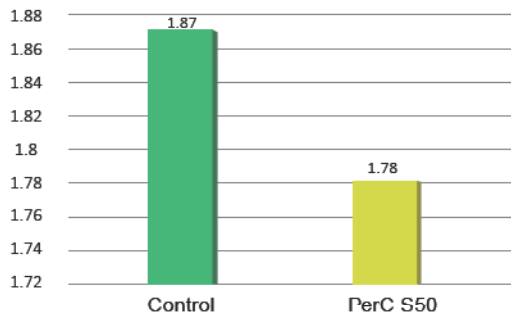


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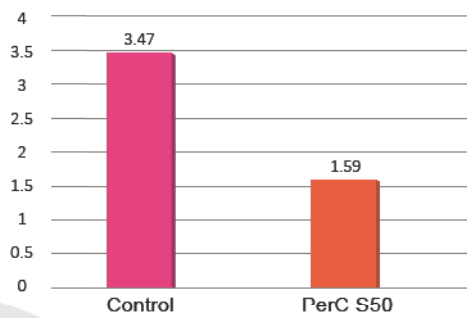
Average Daily Gain and Average Daily Feed Intake g/day



Feed Gain Ratio



Diarrhea Rate %



The Comparison of Economic Benefit

	Control	PerC S50
Total Weight Gain, kg/each	11.10	12.01
Total Feed Intake, kg/each	20.73	21.37
Basic Feed Cost, RMB/each	95.34	98.29
Sodium Butyrate Cost, RMB/each	0.00	0.53
Weight Increase Value, RMB/each	210.98	228.24
Average Gross Profit, RMB/each	115.6	129.4

NOTE: The price of feed: 4.6 RMB/kg, the price of pig: 19 RMB/kg. The table shows that average gross profit of PerC S50 add group is 129.4 RMB/each, which earns more 13.8 RMB/each compared with control group.



Intestinal Morphology

		Control	PerC S50
Duodenum	Villus Height (µm)	450.2±10.71	590.7±34.80
	Crypt Depth (µm)	185.15±22.31	198.53±10.55
	Villus/Crypt	2.43±0.21	2.98±0.44
Jejunum	Villus Height (µm)	483.39±18.09	581.39±27.41
	Crypt Depth (µm)	190.82±30.2	211.3±19.02
	Villus/Crypt	2.53±0.51	2.75±0.25
Ileum	Villus Height (µm)	465.79±9.68	571.66±32.47
	Crypt Depth (µm)	189.88±11.96	219.24±20.36
	Villus/Crypt	2.45±0.32	2.63±0.19

The table shows that PerC S50 can improve both small intestinal villus height and specific value of villus and crypt, the intestinal villus height increases by about 30%.



Control

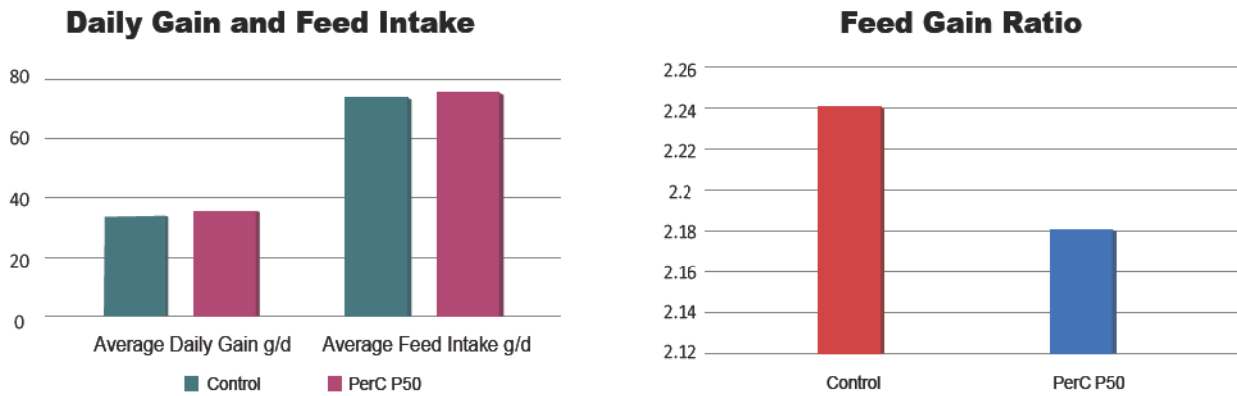


PerC S50

Application Effects on Broilers

1-day-old healthy Lingnan yellow broilers were selected for this trial. Group I was control group. 200 g/T PerC P50 was added in Group II on the basis of basic diets, test period was 50d.

Production Performance



As shown above, adding 200g/T of PerC P50 in the broiler feed can effectively improve the daily gain and reduce feed gain ratio.

Intestinal Morphology

		Control	PerC P50
Duodenum	Villus Height (µm)	1095.2 ± 30.4	1283.11 ± 39.80
	Crypt Depth (µm)	135.1 ± 27.46	140.35 ± 10.98
	Villus/Crypt	8.11 ± 0.97	9.14 ± 0.47
Jejunum	Villus Height (µm)	1039.4 ± 28.07	1358.96 ± 37.54
	Crypt Depth (µm)	130.73 ± 10.21	141.34 ± 13.01
	Villus/Crypt	7.95 ± 1.15	9.61 ± 0.98
Ileum	Villus Height (µm)	790.9 ± 29.08	887.74 ± 27.4
	Crypt Depth (µm)	129.48 ± 8.43	132.13 ± 10.55
	Villus/Crypt	6.11 ± 0.97	6.73 ± 1.33

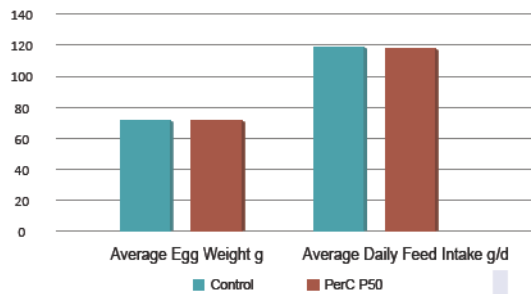
The table shows that PerC P50 can both improve small intestinal villus height and specific value of villus and crypt, so that it improves the digestion and absorption of feeds, it reduces watery diarrhea, feed feces and feed gain ratio.



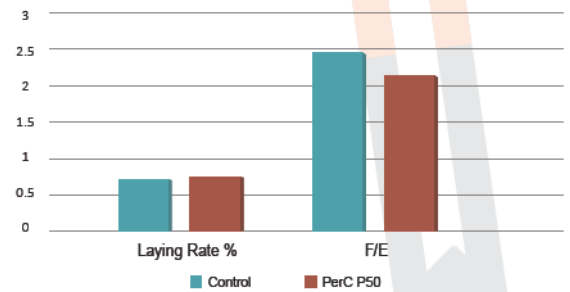
Application Effects on Laying Hens

500 feather healthy commercial laying hens (48-week-old) were selected for this trial. Group I was control group. 150 g/T PerC P50 was added in Group II on the basis of basic diets, test period was 60d.

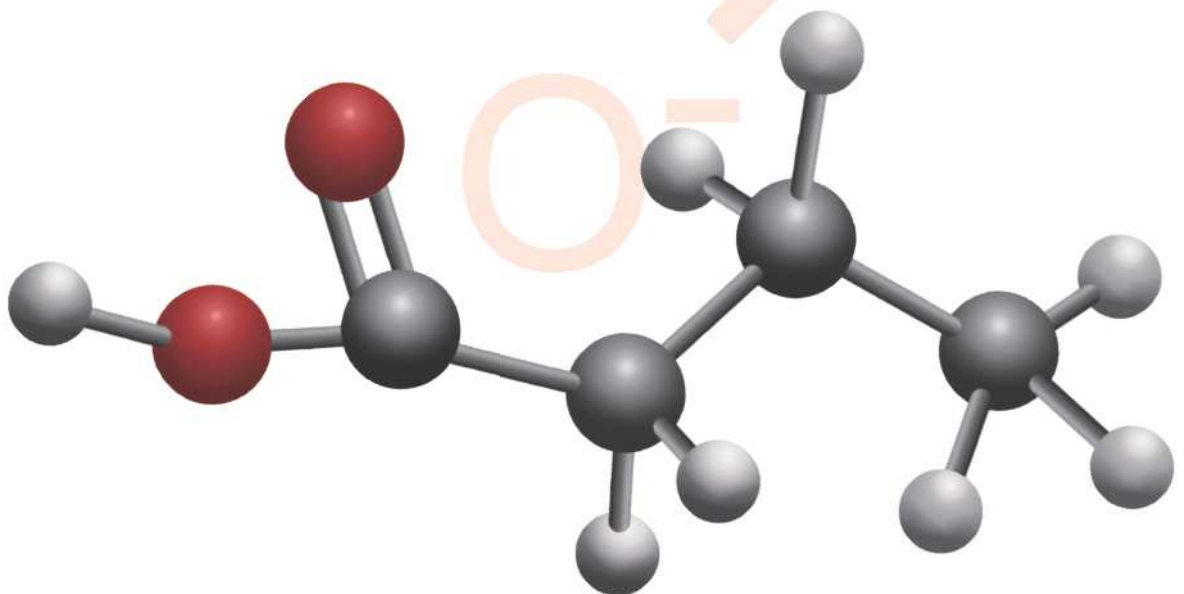
Average Daily Feed Intake and Average Egg Weight



Laying Rate and Feed Egg Ratio



The figure shows that PerC P50 can improve the laying rate in late peak period and eggs weight and reduce feed egg ratio.





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Usage & Dosage

Per T fodder allowed to add this product:

Concentrated feeds, premixes are in proportion to add this product after conversion:

Species	Creep Feed (g/T)	Piglets (g/T)	Fattening Pigs (g/T)	Pregnant Sows (g/T)	Lactation Sows (g/T)
PerC S50	1000-2000	600-800	300-500	1000	500-800
Species	Broilers (g/T)	Laying Hens (g/T)	Breeding Hens (g/T)		
PerC P50	200-400	100-300	200-600		

NOTE: In order to ensure uniformity in the feed, the use of this product need to be pre-mixed firstly, and then gradually added to the follow-up feed.

This product is used as soon as possible after unpacking, the remaining parts need to tie up and keep in dark place.

Packaging & Storage

This product is packaged in a bag or barrel, the net weight of product is 25kg, and details see the package label.


Keep away from heat, moisture and direct sunlight, not with toxic and harmful substances mixed.


Under the condition of original package, the shelf life is 12 months.



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