performa **40**

By

NUTRIAID

www.nutriaid.co

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Protected butyrate.No odor and low dissociation in the stomach.

High stability to do its action in the small intestine and colon. The high concentration and protection make it the most cost-effective product on the market. This data is easily calculated, taking into account:

- The price per kg.
- The concentration (40%)
- And the percentage of dissociation in the stomach (only10-15%)

And it serves to compare it with other products (odorless,ofcourse). 40% of sodium butyrate protected with fat.This fat is degraded in the intestine to release butyrate at the right place.

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TARGETS

performa 40 has a number of major actions (associated butyrate):

- Increases feed intake.
- Increases the action of all the enzymes throughout the digestive tract.
- Increases development of beneficial intestinal flora, and inhibit the growth of pathogenic bacteria and fungi (prebiotic effect).
- Natural source of energy for intestinal cells.
- All this leads to improvements in performance of the animals.

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ACTIONS:

Effects attributed to butyrates* include:
-Better nutrient digestibility which results in an increase in performance
-Stimulation of secretion of digestive enzymes
-Optimization of intestinal microbiotaand an improvement of the epithelial integrity and defense systems
-Tissue development and repair in the digestive tract
-Down-regulation of bacterial virulence
-Control of gut health disorders caused by bacterial pathogens, especially in young animals.

* P. Guilloteau et al. (Nutrition Research Reviews (2010), 23, 366-384).

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1) Smell: Attraction / Appetite / Early consumption of feed

2) Germs: Favours the development of acidophilus/ Penalizes the non acidophilus

3) Villi: Increases the length of intestinal villi / Integrity of mucous / Increases absorption surface

4) Pancreas: Stimulation of Endocrine & Exocrine secretions

- Insulin amylase
- glucagon protease
- somatostatinlipase

5) Small Intestine: Stimulation of intestinal enzyme (lactase, malataseand sucrase)

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DOSES

When ?	Kg per ton.
Weaned piglets until 12 kg	1 –2 kg.
Piglets from 12 to 25 kg	1 –1.5 kg.
Pigs from 25 to 110 kg	0.5 -1 kg.
Sows	0.5 -1 kg.
Ruminants pre-weaned	1 –2 kg.
Ruminants post-weaned	0.5 -1 kg.
Broilers	0.5 –1.5 kg.
Layers	0.5 –1.5 kg.
Rabbits	0.5 –1.5 kg.

Butyrate: main actions

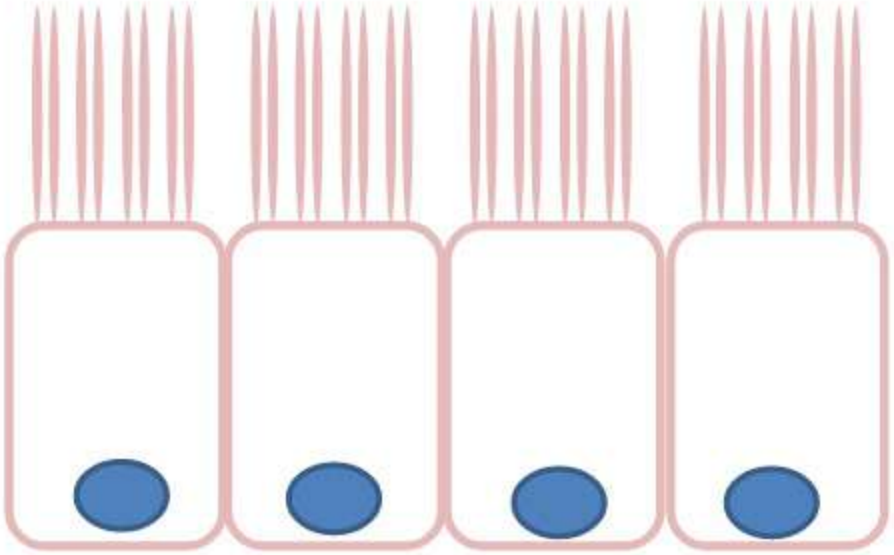
- Villi preservation and growth
- Intestinal enzyme production
- Benefits in the flora

Main results:

- More consumption
- Best feed conversion rate
- Less diarrhea
- Recovery after antibiotic treatment
- Less wet beds (poultry)- less pododermatitis in broilers
- Better calcium absortion
- Higher milk and feed intake in calves

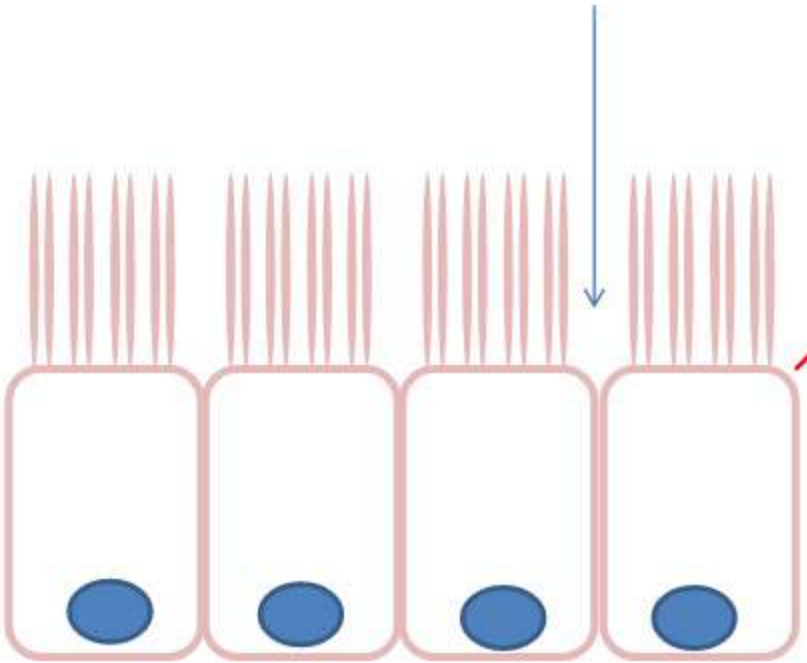
With the intestinal wall integrity we mean:

- A correct villi border
- A correct link among the cells
- A correct “behavior” of the cells (correct function)



This link between the cells must be intact to avoid the penetration of Bacteria and their toxins

This border must be as high as possible to propitiate a correct absorption of nutrients



These are the receptors that Bacteria use to link to intestinal cells

Management of the intestinal microflora is also a target (health and performance).

We manage microflora in two senses:

To decrease the number of negative bacteria *(E.coli, Salmonella, Campylobacter, Shigella...)*

To increase the number of positive ones (*Lactobacilli, Bifidobacteriae)*.

		Enterobacterias	Lactobacilos
Yeyuno	Control	3.7	4.1
	Butirato 1kg	3.0	4.6
Ileon proximal	Control	4.0	6.1
	Butirato 1kg	3.7	6.4

(Valores expresados como Log 10 unidades, microbiología) .

Nollet, 2002, unpublished

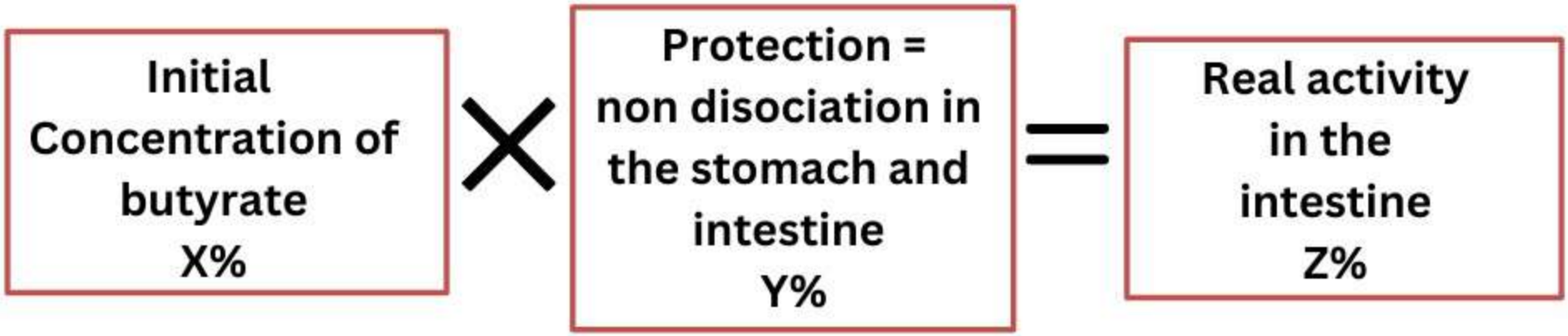
Which butyrate is the best?

The best is to have the possibility of selling all of them, and to have options to accomplish the customer's needs in every moment.

We can choose what they need, or we can let them choose what they want

Concentration and protection:

With these 2 parameters we can calculate the activity of each product



If you add the price to these figures, you will get and show to customers the real price per unit of activity.

PRODUCT	% BUT	% NON DISOCIATED	% REAL	DOSE (g) TO GET 500 g NETO
andBUT 95	95%	25%	24%	2105
PERFORMA 40	40%	90%	36%	1389
ADIMIX	30%	90%	27%	1852

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The active component is butyric acid, a short chain fatty acid or volatile fatty acid,natural component of animal metabolism.

Butyric acid presents particular and complex biological and cellular active actions which other organic acids, commonly used in animal nutrition, do not have (Kruh, 1982) (like hyperacetylation of histones, gene expression, induction of proteins, including enzymes, hormones...).

The butyric acid is liquid and very volatile at environmental temperature; while sodium butyrate is a stable non-volatile powder upto 250°C.

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For the sodium butyrate to develop its main actions, it has to get undissociated to the intestine.

Other sodium butyrates (non protected) gets dissociated very quickly in the stomach and does not reach the intestine, place of action. So they simply act in the stomach as a common (and expensive!!!!!) acidifier.

We have developed a specific manufacture method that enable us

to produce a sodium butyrate which gets to intestine undissociated: **performa40**

From the nutritional point of view, the pure form of the sodium butyrate at 98% is less active than performa 40 (at40%) (from 3 to 4 times less active).

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Compared with other protected butyrates, performa 40 is cheaper, because with our unique protecting technology, we can get 40% (instead of only 30% of main competitors)
The smell is very low.
Compared with monobutirin our price is cheaper, and there are no differences in results.

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There are many articles and references that can be found on the use of butyrate in animal feed.

Summarizing, we can say that butyrate is an additive that improves the intestinal health of the animals, since very important operates at two levels, the cell wall integrity (intestinal villi) and the gut microflora (favoring positive bacteria).

This improves intestinal health means fewer digestive problems and improvements in production.

To choose the correct butyrate is very easy, pay attention to the initial concentration, the stomach percentage of dissociation and the price. With these three parameters, you will not fail.

Butyrate biblio references (general)

The addition of broiler feed with an additive based on encapsulated calcium butyrate give promising perspectives for optimizing the technical and economical results.

Actes des 9èmes Journées de la Recherche Avicole, Tours, France, 29 et 30 mars 2011 2011 pp.247-250

Supplemental Sodium Butyrate Stimulates Different Gastric Cells in Weaned Pigs.

Maurizio Mazzoni, and others.

American Society for Nutrition

The performance and health of young calves appear to prosper when the short-chain fatty acid sodium butyrate is added to milk replacer during the summer, according to research from the University of Minnesota's Southern Research and Outreach Center in Waseca, Minn. It also may be an acceptable alternative to Rumensin in calf starter.

Butyrate biblio references (layers)

Eggshell strength was lower in eggs from the control than from the treatment group. The percentage of eggs produced by the control group was significantly lower than that by the supplemented group. Percentage of dirty, cracked and misshapen eggs, and the hatchability percentage of the control group were also significantly lower than in the group receiving SCFA.

It was concluded that dietary supplementation of SCFA to layer breeder hens from 66 weeks of age onwards improved egg shell strength, reduced the percentage of dirty, cracked and misshapen eggs and increased the hatching percentage of the eggs.The positive responses were suggested to be largely due to the butyrate in the SCFA.

Short Communication Effects of short chain fatty acid (SCFA) supplementation on performance and egg characteristics of old breeder hens

E Sengor, M Yardimci, S Cetingul, I Bayram, H Sahin, I Dogan

Butyrate biblio references (layers)

Effect of dietary organic acid supplementatio on egg production, egg quality and some blood serum parameters in laying hens.
From the obtained data it can be concluded that organic acid supplementation of laying hens diet improve live body weight, improve persistence of lay and from economical point of view we can conclude that organic acid addition can lead to amazing increase in the economical efficiency of layer production.

M.A. Soltan

Butyrate biblio references (humans)

Butyrate Enhances the Intestinal Barrier by Facilitating Tight Junction Assembly via Activation of AMP-Activated Protein Kinase in Caco-2 Cell Monolayers.

Luying Peng, Zhong-Rong Li, Robert S.Green, Ian R. Holzman, and Jing Lin

Department of Pediatrics, Mount Sinai School of Medicine, NewYork, NY10029-6574; Department of Pediatric Surgery, Yuying Children's Hospital of Wenzhou Medical College, Wenzhou, China 325027; and Department of Medical Genetics, Tongji University School of Medicine, Shanghai, China 200092.

Bibiography (calves)

Sodium-butyrate as a growth promoter in milk replacer formula for young calves.

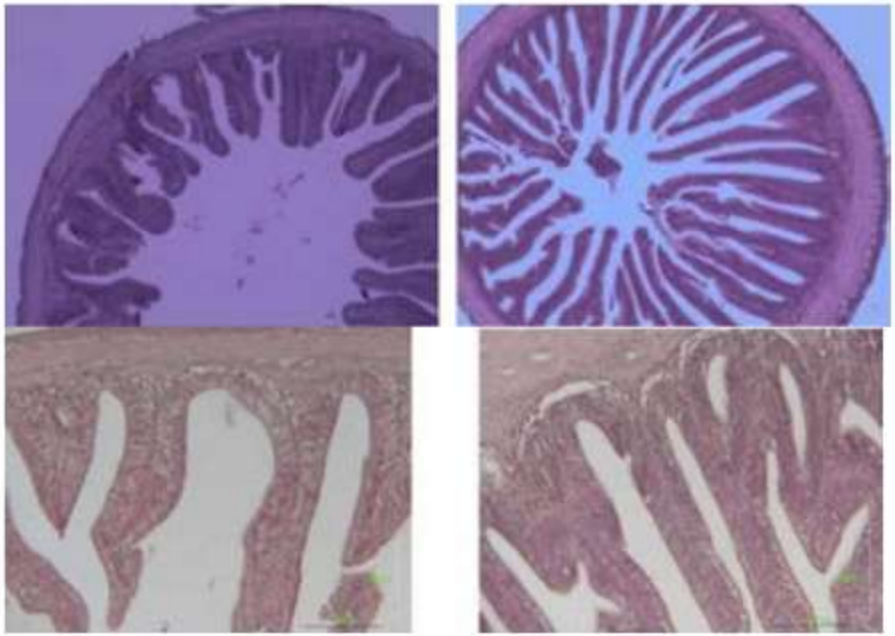
In milk fed calves, the effects of sodium butyrate to replace flavomycin on growth performance and some mechanisms involved were studied. Pancreatic and intestinal morphology, digestive enzyme activities, plasma gut regulatory peptide concentrations, and expression of their receptors in the gastrointestinal tract were measured.

Supplementation with Sodium butyrate enhanced growth rate and improved feed conversion into body weight gain compared with the flavomycin group. Supplementation with Na-butyrate was likely associated with an improvement in efficacyof the gastrointestinal tract digestive capacities expressed by enhanced production of digestive enzymes and increased absorptive capacities in the upper small intestine.

Owen et al. (Biarriz 2006), tested Na-butyrate as a feed additive in the tropical catfish (Clarias gariepinus). They added at 0.2% to two diets differing in their major protein source (fish meal or defatted soya).

Slightly higher growth and improvement in FCR were observed in catfish fed the fish meal diet supplemented with Na-butyrate, compared with the control diet. Na-butyrate supplementation also appeared to increase the proportion of Gram-positive bacteria in the hindgut of C.gariepinus.

A protective effect of butyrate on the European sea bass intestine histological structure has been observed and such effect could be extended to the liver as well.



**Distal Intestine of Seabass fed basic diet, withour and without butyrate. (Ematoxiline-Eosinex4)*