



ProPhorce® PH

Making a difference in bacterial inhibition

Feed additives that give key benefits

- ➔ Strong effect against harmful bacteria
- ➔ Effective at high and low pH levels
- ➔ Improved digestibility of nutrients
- ➔ Enhanced hygiene along the food chain
- ➔ Strong reducing effect on stomach pH

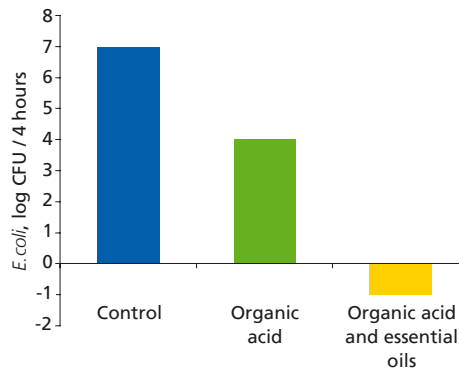
Highly effective antibacterials

Organic acids are used extensively in pig- and poultry feed, aiming to improve the intestinal health and to enhance animal performance. The unique combination of organic acids and essential oils in ProPhorce® PH provide a very cost effective acidification and a strongly enhanced antibacterial effect at a pH level of 6 or 7, as may be found in the crop and the small intestine.

ProPhorce® PH is the result of many years of research into the antibacterial effect of the combination of organic acids and essential oils. The antibacterial qualities of specific plant extracts are being used. These plant extracts protect plants against attacks of microorganisms.

Maximum effect due to synergism

In vitro bacterial growth inhibition tests have shown that organic acids and essential oils strongly enhance each other's antibacterial effect. The synergistic effect of organic acids and essential oils in ProPhorce® PH on the reduction of *E.coli* at pH 6 is shown in the following graph.



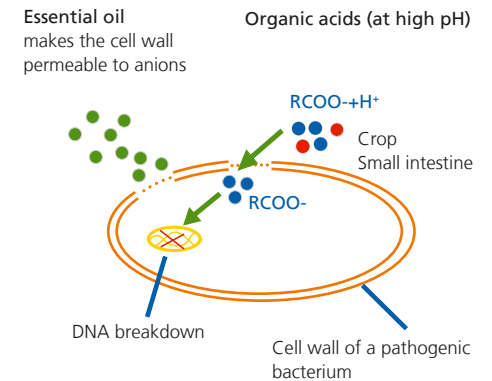
Synergistic effect of organic acids and essential oils in the ProPhorce® PH antibacterial products on the reduction of *E. Coli* at pH 6.

Although ProPhorce® PH is used in a similar way as our acidifiers, scientific research has shown that essential oils give a high added value because of:

- ➔ An enhanced antibacterial effect caused by the synergistic action with organic acids
- ➔ An improved effectivity at high and low pH levels

Mode of action

The mode of action of ProPhorce® PH is comparable to ProPhorce® AC, but at high pH levels the essential oils enable the anions of organic acids to penetrate the bacterial cell wall and disturb the metabolic processes in the bacterial cell.



Synergistic effect of organic acids and essential oils in inhibiting pathogenic bacteria at high pH.

At neutral pH levels (as e.g. in the crop of poultry and the small intestine) an organic acid will dissociate (COO^- and H^+) and normally these ions will not be able to penetrate a bacterial cell. However, specific essential oils make the cell wall permeable to these ions at higher pH levels, enabling organic acids to be more effective throughout the entire gastrointestinal tract.



User guide

Besides acidifying animal feed and drinking water, there are many ways to improve animal health. Farm management is the relationship between different factors, such as the internal and external hygiene and the optimization of feed and water, which influence the health and the productivity of the animal.

Either via the feed or via the drinking water, ProPhorce® PH can be used for different purposes:

- ➔ Highly effective antibacterial acidification in the young animal
- ➔ Economical acidification in the older animal
- ➔ Economical *Salmonella* inhibition

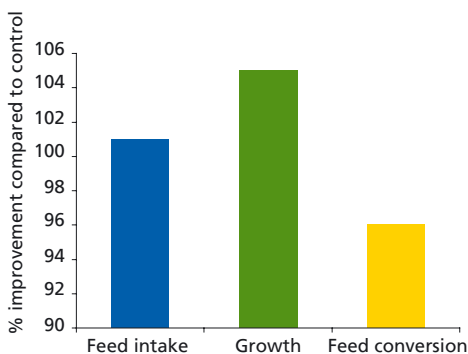


Antibacterial acidifier in the young animal

In case of weaning diarrhea the problems start 4 to 6 days after weaning. The piglets suffer from diarrhea which could lead to death by dehydration. This is caused by the *E. Coli* bacterium. To prevent weaning diarrhea a number of measures can be employed, among which the addition of acids to the feed or the drinking water. ProPhorce® PH has been extensively tested for its effectiveness against *E. Coli* (see graph on the previous page).

Economical acidification

In practice ProPhorce® PH was tested on growers. The animals were given a feed with additional organic acids and essential oils. Results showed that growth and feed conversion improved considerably compared to the control feed without addition. The results are shown in the graph below.



Effect of the combination of organic acids and essential oils (ProPhorce® PH) on growers.

Dosage advice for compound feed

Dosage		
Weaned piglets (< 12 kg)	5-7,5	kg/ton
Piglets (> 12 kg)	5	kg/ton
Growers	3-5*	kg/ton
Poultry	3	kg/ton

* Depending on the application and the age of the grower.

When ProPhorce® PH is used for other than curative reasons, a lower dosage rate is required.

Dosage advice for drinking water

Animal	Application	Schedule	Dosage	pH Drinking water
Weaned piglets	E. coli	Continuously from weaning	1,0-2,0	3,5-4,0
Sow in gestation	Prevention of MMA	Two weeks before farrowing	1,0-2,0	3,5-4,0
Growers	Diarrhea	Continuously, but longer than 2 weeks	1,0-2,0	3,5-4,0
Broilers	Performance enhancement	1st week: every day	1,0-1,5	3,7-4,0
		Week 2-6: just the first 2-3 days		
	E.coli	1st week: every day	1,0-1,5	3,7-4,0
		Salmonella	Preventive	1,0-1,5
		1st week: every day. No more after that		
		During 7 days prior to sample taking and during 5 days prior to slaughtering		
Layers	Salmonella	Preventative: 2-3 weeks continuously	1,0-1,5	3,7-4,0
Rabbits	Enterocolitis	When the problems start, treat the rabbits continuously; Rabbits may also undergo preventive treatment, 5 days before the problems are expected to occur.	1,0	3,5-4,0



Your Winning Formula

The Perstorp Group is the world leader in several sectors of the specialty chemicals market. Few chemical companies in the world can rival its 125 years of success. Today we have a rich performance culture distilled from our long history and extensive knowledge in the chemical industry. That culture and knowledge base enables us to produce Winning Formulas for a wide variety of industries and applications.

Our products are used in the aerospace, marine, coatings, chemicals, plastics, engineering and construction industries. They can also be found in automotive, agricultural feed, food, packaging, textile, paper and electronics applications.

Our production plants are strategically located in Europe, North America and Asia and are supplemented by sales offices in all major markets. We can offer you speedy regional support and a flexible attitude to suit your business needs.

If you want a partner for feed additives who can offer you focused innovation to enhance your product or application, which is delivered reliably and responsibly, look no further. We have a winning formula waiting for you.