



Optimal acidification  
to reach high performance

# Novicid<sup>®</sup>

Antibacterials & Digestive Aid





Reaching the highest possible animal health status has become a key element for the production of food from animal origin. Clearly the focus has changed from treatment to prevention with optimal digestion and performance in order to maintain profitability.



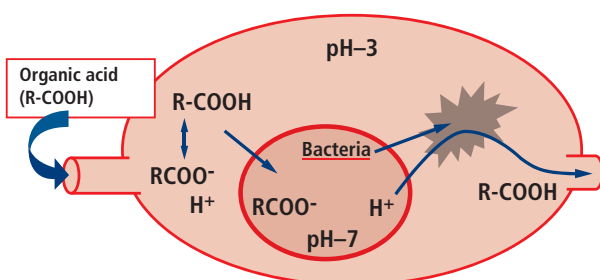
Young animals undergo significant stress due to the demand for high performance early on, whilst their intestinal tract lacks full maturation. This triggers undesirable effects:

1. The natural gastric pH-barrier loses effect against pathogenic bacteria such as Salmonella and E. Coli. This deficit is related to insufficient gastric acid secretion and feed intake with high buffering capacity.
2. Incomplete protein pre-digestion as a consequence of suboptimal activation of pepsinogen to pepsin. This not only affects FCR but also increases the risk of fermentation disturbance in the hindgut since undigested protein fractions serve as nutrients for typical pathogenic bacteria like Clostridium.

Organic acids clearly have the potential to improve the performance of the animals. Due to their multiple effects at a physiological and cellular level, organic acids have a direct and indirect impact on digestive efficiency.

### Direct mode of action of organic acids:

- Safeguard the microbial quality of the feed
- Reduce the buffer capacity of the feed
- Acidify the stomach
- Activate fully the pepsinogen, leading to improved protein digestion
- Improve anti-pathogen barrier function, resulting in lower passage of pathogens to the intestinal area



Effect of pH on E. coli development

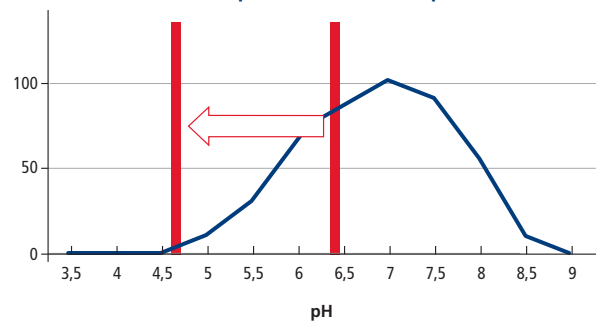


Fig. 1: The anti-microbial effect of organic acids is generated by reduction of pH and active penetration of undissociated acids in the bacterial cells.

### Indirectly this activity positively affects the conditions in the lower part of the digestive tract:

- Secures and optimizes the intestinal microflora
- Stimulates pancreatic secretion and improves overall digestion
- Favors healthy gut fermentation
- Reduces diarrhoea
- Reduces nitrogen and phosphorous excretion.

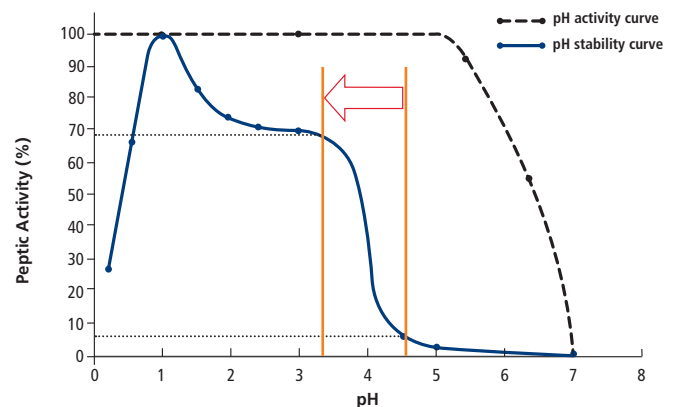


Fig. 2: pH requirement for optimal pepsin activity and protein hydrolysis (D. W. Piper et al, 1965)



### Stomach

- pH reduction
- Buffering capacity
- Pathogens decrease: coliform, salmonella & other bacteria, fungi, yeast
- Improvement of digestive enzymes activity
- Other side effects

### Small intestine

- Pathogens decrease: coliform, salmonella & other bacteria, fungi, yeast
- Stimulation of pancreatic enzyme secretion
- Improvement of nutrient digestibility (proteins, minerals, amino acids)

### Large intestine

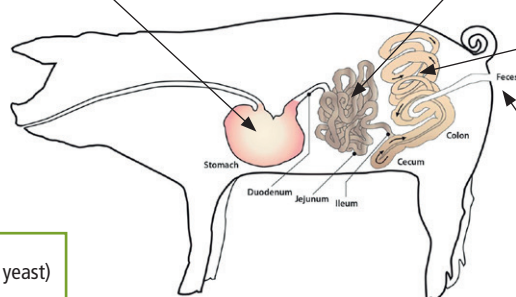
- Promotion of the natural microflora
- Pathogens decrease: coliform, salmonella & other bacteria, fungi, yeast & their toxins

### Faeces/urine

- Promotion of a stable and normal microflora
- Reduction of diarrhoea
- Reduction of nitrogen and phosphorus excretion

### Feed

- Antimicrobial effects (bacteria, fungi, yeast)
- Increase of feed intake, ADWG, FCR



Correct acidification leads to a cascade of digestive benefits.

## The Novicid® line

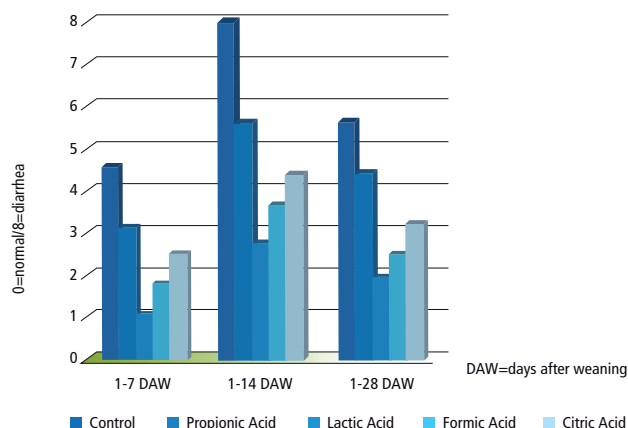
The **Novicid®** line is based on well selected acids to guarantee maximum activity in the intestinal tract, focusing on in vivo efficiency. The choice of the acids largely depends on the application and the desired effect. Also, other parameters such as corrosiveness, economics, pungency, volatility and acceptance by the animal should be taken into account. Two main organic acid will form the backbone of the **Novicid®** product line:

**Formic acid** is a short chain organic acid with a high pH-reducing potential and high MIC values for several bacteria. Due to the high number of atoms per weight unit, it forms the ideal choice for a strong pH reducing acid mix.

**Lactic acid** originates from fermentation, is non-corrosive and very well accepted by the animal. This secures feed intake when high levels of acids are used. Based on in house in vivo trial work and independent literature, lactic acid acts strongly against pathogenic E. Coli and is superior for prevention of diarrhea.

In order to increase the efficiency of **Novicid®**, certain formulations are enriched with other compounds like benzoic acid, Medium Chain Fatty Acid, mono-esters of butyric acid or lauric acid to broaden the activity and obtain maximum functionality.

The form in which the acid is presented is mainly defined by its application (farm/feed mill).



## Standard recommended dosage (kg/MT):



**Piglets prestarter** (till 2 weeks after weaning): 3-5

**Piglet starter:** 2-5

**Pigs (grower/finisher):** 2-4

**Sows:** 2-4



**Broiler starter:** 2-4

**Broiler grower/finisher:** 1-3

**Layer/breeder:** 1-3

## Novicid® Standard range and application:

Novicid® Liquid range	Novicid® Liquid on carrier range	Novicid® Reacted range
Liquid blend of acids, highly concentrated (no carrier)	Liquid blend of acids on mineral carrier (Silica, E551a)	Reacted blend of organic/inorganic acids
<ul style="list-style-type: none"> <li>Liquid blend of acids, highly concentrated (no carrier)</li> <li>Application in feed</li> <li>Application directly in mixer via liquid application system</li> <li>Pure acids or partially buffered in function of corrosiveness / ADR</li> <li>Other acids can be added, but limited to their solubility</li> <li>FOCUS: pH reduction at the level of the stomach and antibacterial activity</li> </ul>	<ul style="list-style-type: none"> <li>Liquid blend of acids on mineral carrier (Silica)</li> <li>Application in feed</li> <li>Pure acids or partially buffered in function of corrosiveness / ADR</li> <li>Other acids can be added, independent from their solubility</li> <li>FOCUS: pH reduction at the level of the stomach and antibacterial activity</li> </ul>	<ul style="list-style-type: none"> <li>Reacted blend of organic and/or inorganic acids</li> <li>Application in feed, premixes and concentrates</li> <li>Highly concentrated (no carrier)</li> <li>Non-volatile (odorless) and non-reactive</li> <li>Reacted acids – complete buffered (non-corrosive – no ADR)</li> <li>FOCUS: Reduction of buffer capacity, highly available Ca/P source and antibacterial activity</li> </ul>
<b>10015 Novicid® L</b> Lactic/Formic/Propionic Total acid: 63,5%	<b>10013 Novicid®</b> Lactic/Formic Total acid: 29,5%	<b>10007 Novicid® 12P</b> Formic/Phosphoric Total acid: 70,7%
<b>10015 Novicid® 75 L</b> Lactic/Formic Total acids: 77,3%	<b>10014 Novicid® S</b> Lactic/Formic Total acid: 46%	<b>10057 Novicid® 18Ca</b> Lactic/Formic/Phosphoric Total acids: 59%
<b>10015 Novicid® LAFO L</b> Lactic/Formic + Esters Total acids: 63,7% + 10% MB	<b>10628 Novicid® Forte</b> Lactic/Formic + C8/C10 + ML + Benzoic Total acid: 45,2% + 4,5% ML	



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