



# the essence for a more productive nutrition

**amaril®** is an **excellent growth promoter** that acts by improving the digestibility of feed, improving nutrient absorption and regulating the intestinal flora.

In addition, **amaril®** has a **high antibacterial capacity**, especially against coliforms and salmonella, thanks to the synergistic effect of cinnamaldehyde and the organic acid which, by acting in combination, achieve an effect far greater than the sum of their individual effects.



**amaril®** is indicated for all species or categories of animal

## Composition

Organic acid and natural cinnamon extract (50% cinnamaldehyde).

## Indications

As a production stimulant.

## Benefits

- Regulates the intestinal flora.
- Improves the intestinal wall.
- Improves nutrient absorption.
- Stimulates digestive and antioxidants enzymes.
- Decreases the bacterial load.

## Packaging

- Powder in 25 kg bags.
- Liquid in 1,000 L containers.

## Dosage

1,000 g or cc/MT of feed.



## antibacterial capacity of cinnamaldehyde

### minimum inhibitory concentration of various essential oils\*

	anaerobes min. concentration (p>99,7%)	coliforms decrease 1 log unit	lactobacilli Effect
carvacrol	255 mg/L	371 mg/L	High. Non-selective
thymol	258 mg/L	400 mg/L	High. Non-selective
eugenol	223 mg/L	565 mg/L	
<b>cinnamaldehyde</b>	<b>56 mg/L</b>	<b>104 mg/L</b>	<b>Low. Selective</b>

\*J. Michiels, J.A.M. Missotten, D. Fremaut, S. De Smet, N.A. Dierick

### anti-salmonella activity of various essential oils\*

(p ≤ 0.05)	thymol	carvacrol	<b>cinnamaldehyde</b>
<i>S. Typhimurium</i>	400 mg/L	400 mg/L	<b>200 mg/L</b>

\*Feng Zhou, Baoping Ji, Hong Zhang, Hui Jiang, Zhiwei Yang, Jingjing Li, Jihai Li y Wenjie Yan



amaril®  
1,000 L container



amaril®  
25 kg bag



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dex

amaril<sup>®</sup>



Production



Health



Hygiene

CINNAMALDEHYDE + ORGANIC ACIDS

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Stimulates animal production

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Improves digestibility and nutrient absorption

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Regulates the intestinal flora

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dex



years  
feeding  
smart  
solutions



Production



Health



Hygiene

## towards more productive nutrition

In animal nutrition, what is important is not only which feeds are ingested, but also how they are digested and absorbed. Thus, beyond the feeds supplied, the key to good nutrition and good animal production lies in **optimising digestive processes** and minimising their associated problems.

Improving basic matters such as **appetite**, **digestibility of feeds** and **intestinal health** is an opportunity to achieve a better yield with the same feeds.

### combined synergistic effect of organic acids and cinnamaldehyde

**Organic acids are a natural antibacterial agent** that greatly promotes digestive processes, but in high-pH environments such as the intestine, these acids dissociate and lose their ability to penetrate bacteria.

**Cinnamaldehyde** alters the permeability of the bacterial cell wall, thereby allowing organic acids to enter them, even in their dissociated form. This exponentially increases their antibacterial potential and creates an **unbeatable natural synergy**.



## the triple effect of amaril®

### 1. Digestive

#### Appealing, appetising, acidifying

- Stimulates appetite, enzyme secretion and gastric juice secretion
- Activates pepsin
- Improves digestion
- Sanitises feed
- Stimulates pancreatic enzymes
- Decreases intestinal viscosity

Improves the digestibility of feed

### 2. Antioxidant

#### Protects the mucosa; lengthens the villi

- Stimulates catalase and superoxide dismutase
- Traps oxygen radicals
- Protects epithelial cells
- Accelerates the renewal rate of enterocyte
- Reduces pathogenic contamination
- Protects against oxidative stress

Improves nutrient absorption

### 3. Flora-regulating

#### Antibacterial

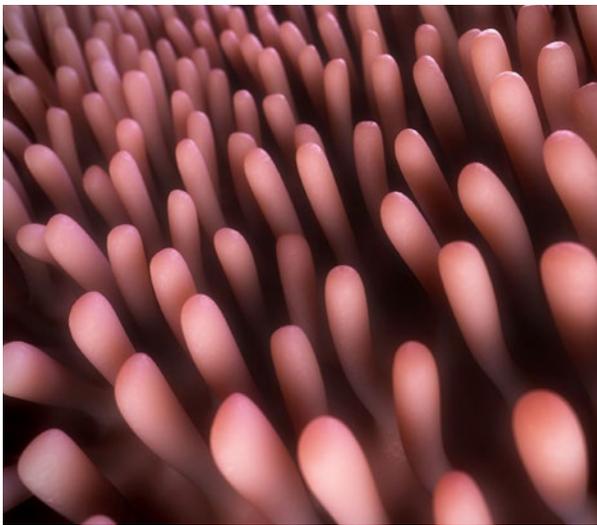
- Controls pathogens (*E. coli*, *Salmonella*, *Clostridium*, etc.)
- Promotes lactic acid flora
- Reduces toxin production
- Reduces intestinal fermentation

Regulates the intestinal flora and improves the intestinal wall

# the essence for a more productive nutrition

## amaril®: protection against oxidative stress

During digestion, oxygen free radicals that are released attack mucosal surfaces and interfere with the passage of nutrients, as they shorten the intestinal villi, thereby reducing the absorption surface area.



3D representation of the intestinal villi. The longer their length, the greater the absorption surface area.

The body defends itself from oxidative stress with the effect of certain enzymes that can attract these oxygen radicals, such as **catalase** and **superoxide dismutase**.

**amaril®** thanks to **cinnamaldehyde**, enhances the antioxidant activity of these enzymes. Accelerates the renewal rate of mature enterocytes and increases the surface area of the intestinal villi. In addition, due to its protective action on the mucosa, **cinnamaldehyde** reduces pathogenic contamination.

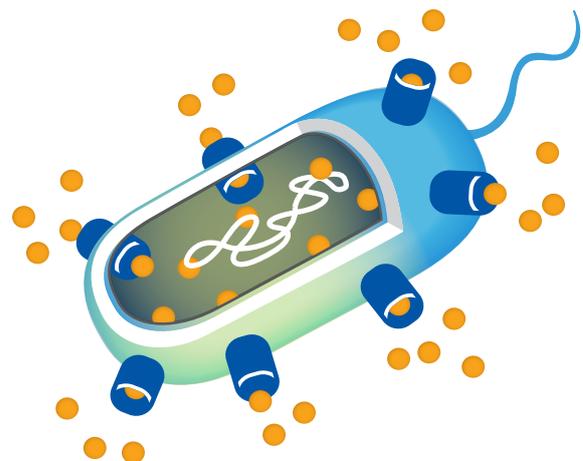
## amaril®: a powerful antibacterial agent

**Cinnamaldehyde** has proven to be one of the essential oils with the highest antibacterial capacity (far greater than other phenolic oils such as carvacrol and thymol), with a very high inhibitory capacity especially against coliforms and salmonella. This anti-microbial capacity is **selective**; it promotes the growth of lactobacilli and lactic acid flora in general.

Combining cinnamaldehyde with formic acid results in a synergistic antibacterial effect far greater than the sum of the individual effects of each ingredient.

**Cinnamaldehyde** acts as a natural antibacterial agent, and in addition alters the permeability of the bacterial cell wall such that organic acid penetrates the bacterium, even in its **dissociated** form (chief form at pHs greater than pKa). This results in a significant increase in the antibacterial strength of the organic acid, and therefore a far greater than expected effect from **amaril®**.

### Synergistic antibacterial effect



#### cinnamaldehyde

Alters cell permeability and creates bridges where the organic acid will penetrate, even in its dissociated form.

#### organic acid

Penetrates the pores created by cinnamaldehyde and, once inside the bacterium, will cause its death.

**amaril<sup>®</sup>** is an excellent production stimulant that also helps to decrease pathological problems

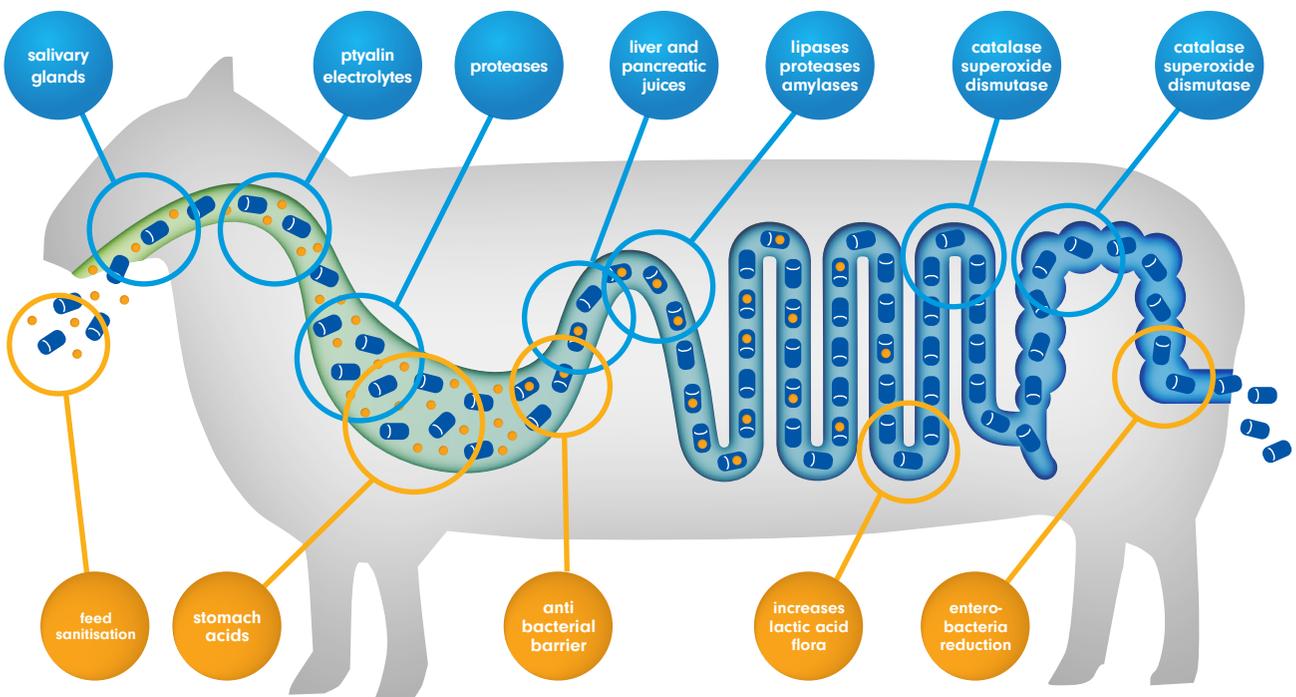


## action of amaril<sup>®</sup> throughout the digestive tract

In addition to stimulating multiple enzymes, **amaril<sup>®</sup>** also achieves a sanitising effect in the animal that results in a decrease in pathological problems and as a result, **in increased production**.

### 1. Enzyme stimulating effect

enhances and improves enzyme action



### 2. Sanitising effect in the animal

progressively decreases the microbial load

#### mouth pH = 5

Enzyme action of cinnamaldehyde.

#### stomach pH = 2 - 4

Digestive effect of the organic acid, especially useful in young animals. Helps to achieve the optimal pH.

#### duodenum pH = 4 - 6

Synergistic effect. Creates a barrier that prevents oral bacterial invasion.

#### jejunum and ileum pH = 6,5 - 7,5

Cinnamaldehyde exerts its maximum stimulant effect and starts its antioxidant effect.

#### large intestine pH = 7 - 7,5

Sanitising action of cinnamaldehyde.

effect of **cinnamaldehyde**

effect of the **organic acid**

**synergistic effect** cinnamaldehyde + organic acid