



...a DSM Eubiotic



a balanced approach...

# CRINA<sup>®</sup> Poultry

delivering improved gut performance

HEALTH • NUTRITION • MATERIALS



# Introduction



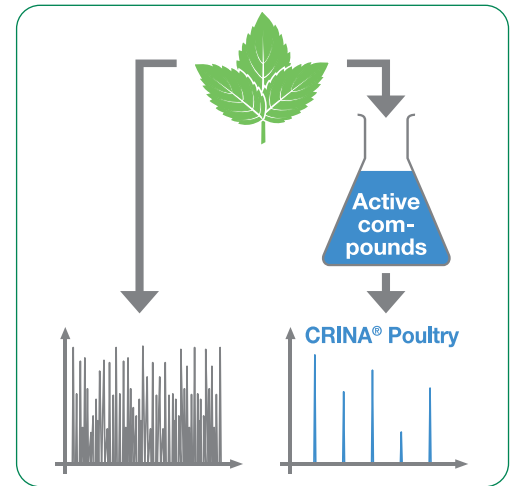
Many plants produce secondary compounds as a defense system against predation, insect attack or bacterial attack. For 5000 years, man has used secondary plant compounds in the form of essential oils as flavors and for antimicrobial properties.

## Designed to perform

Today's trend towards the replacement of in-feed antibiotic growth promoters to improve gut health has driven pioneering research activities at CRINA®.

Following extensive research, a range of precisely formulated and consistent blends of essential oil compounds of high purity, marketed under the CRINA® trademark, was developed.

Not only can essential oil compounds function individually, but their effects can be improved through synergistic effects between individual compounds.



# It works in different ways

## Positive modulation of gut microbial flora

▶▶▶ resulting in a reduced risk of enteric disease.

## Stimulation of production of endogenous enzymes

▶▶▶ feed digestion is enhanced and less substrate is available for gut fermentation.

### Pancreas

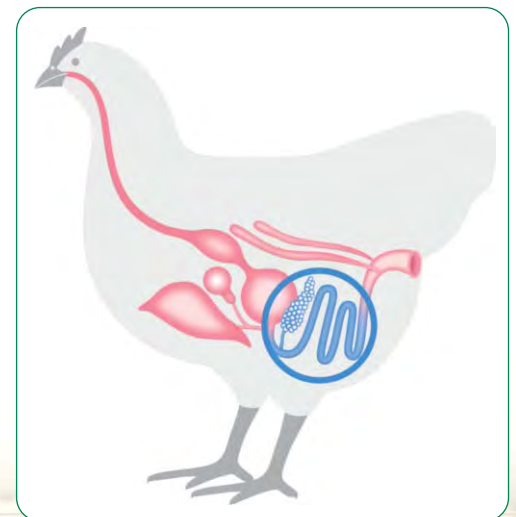
Stimulation of the secretion of enzymes (lipases, amylases, trypsin)

### Small intestine

Stimulation of secretion of digestive enzymes, anti-inflammatory activity, modulation of the gastrointestinal microflora

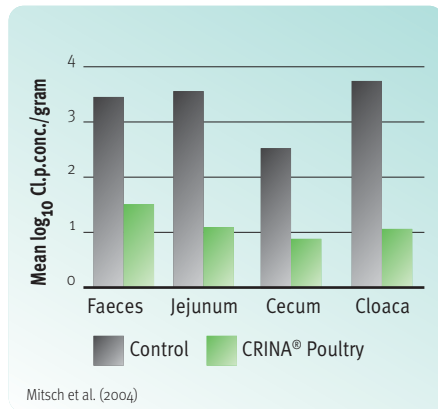
### Large intestine

Anti-inflammatory activity, modulation of the gastrointestinal microflora



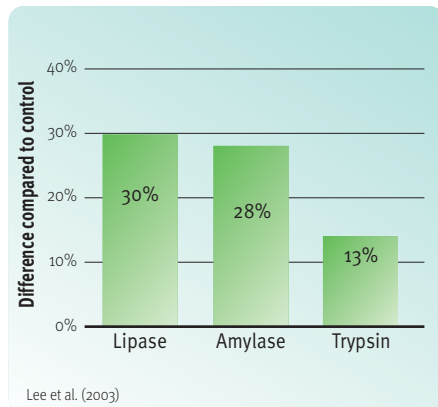
# The benefits

The benefits of feeding CRINA® Poultry have been proven and verified in trials at well-respected independent research centres around the world.



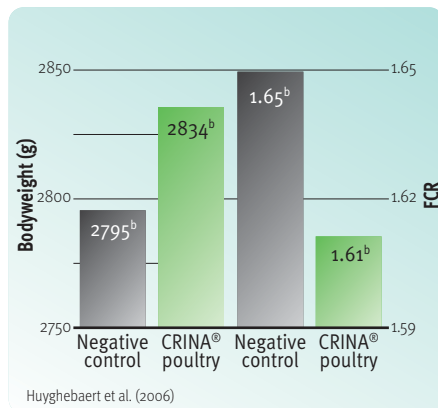
## Gut health

Research by Mitsch et al. (2004) identified a modulating effect after 14 days on *Clostridium perfringens* when CRINA® Poultry was added to the diet of broiler chickens compared to a control diet.



## Stimulation of enzyme production

Lee et al. (2003) proved the enhancement of pancreatic enzyme production in broiler chickens at day 21 when CRINA® Poultry was added to the feed in comparison to a control group.



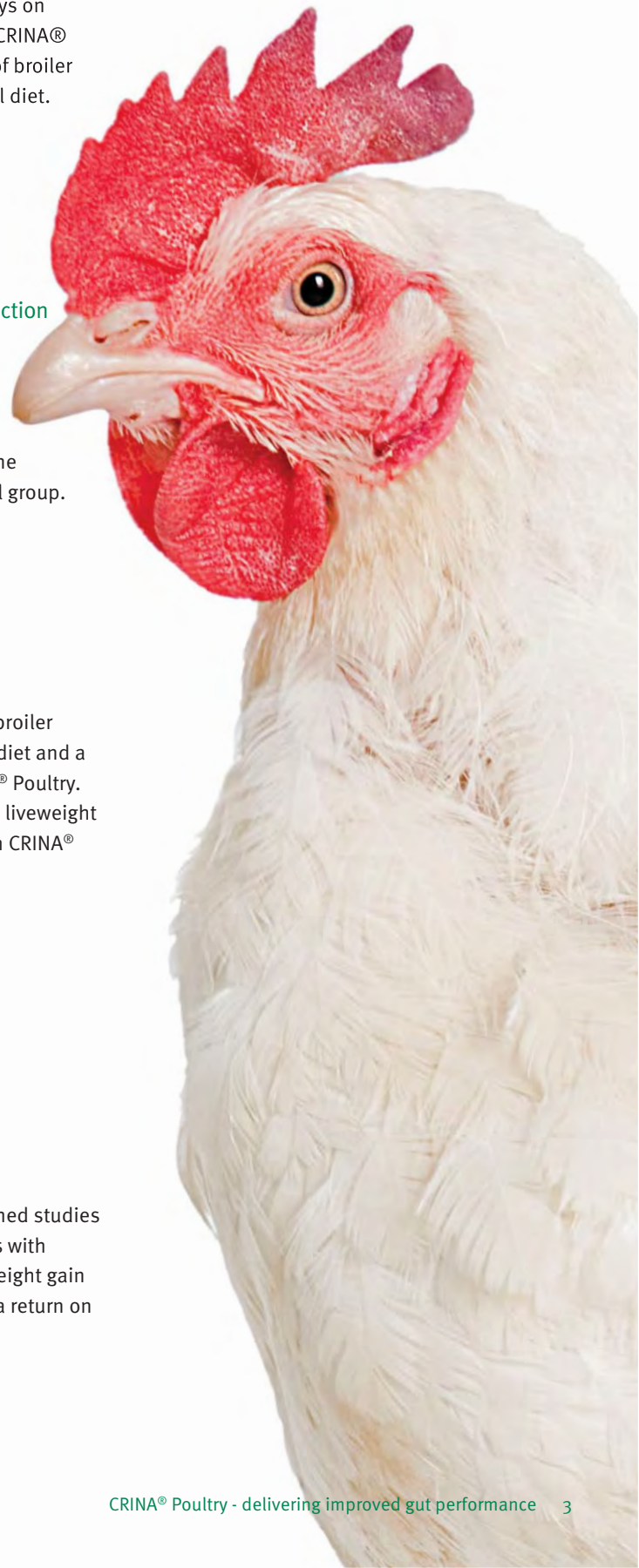
## Performance

Huyghebaert et al. (2006) fed broiler chickens for 42 days a control diet and a diet supplemented with CRINA® Poultry. They observed improvement in liveweight gain and feed conversion when CRINA® Poultry was added to the feed.

# The economics


## Improved profit margin

Results from a series of published studies show that supplementing diets with CRINA® Poultry improves liveweight gain and feed efficiency, and gives a return on investment of 5:1.



# Supplementation guidelines

CRINA® Poultry recommended feeding rates

	Starter	Grower to slaughter
Broilers	100-150 mg/kg	50-100 mg/kg
Turkeys	100-150 mg/kg	50-100 mg/kg
Layers	50-100 mg/kg	

Supplementation levels should be adapted according to local conditions.

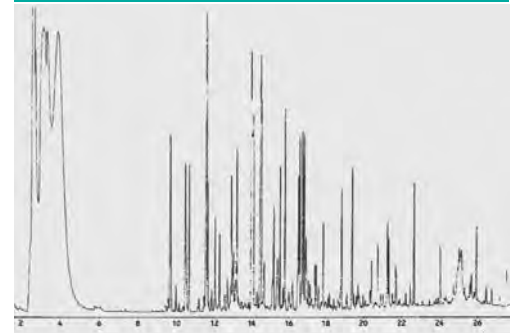
## DSM Quality you can trust

As market leader, DSM Nutritional Products constantly strives to maintain and advance its own high quality standards. The aim is not only to be the benchmark for the industry but also to give our customers the peace of mind that only comes with a superior quality supply.

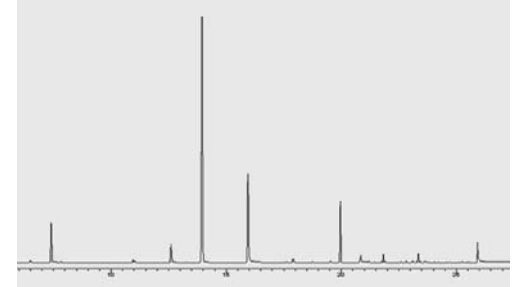
Plant derived extracts can show high variation in composition. In addition seasonal variations can have a significant effect on purity.

With **CRINA® Poultry** we select the most promising compounds of high purity and combine them in a unique blend – adapted to animal needs.

### Plant derived extracts



### CRINA® Poultry



For further information, please see:

[www.dsmnutritionalproducts.com](http://www.dsmnutritionalproducts.com)

[www.crina.com](http://www.crina.com)

or contact:

DSM Nutritional Products Ltd  
PO Box 2676,  
CH-4002 Basel,  
Switzerland

©DSM 2012

#### DISCLAIMER

Although DSM has used diligent care to ensure that the information provided herein is accurate and up to date, DSM makes no representation or warranty of the accuracy, reliability, or completeness of the information. The information provided herein is for informational purposes and is intended for business to business use only. This publication does not constitute or provide scientific or medical advice, diagnosis, or treatment and is distributed without warranty of any kind, either expressly or implied. In no event shall DSM be liable for any damages arising from the reader's reliance upon, or use of, these materials. The reader shall be solely responsible for any interpretation or use of the material contained herein. The content of this document is subject to change without further notice. Please contact your local DSM representative for more details. All trademarks listed in this brochure are either registered trademarks or trademarks of DSM in The Netherlands and/or other countries.

A0075

March 2012