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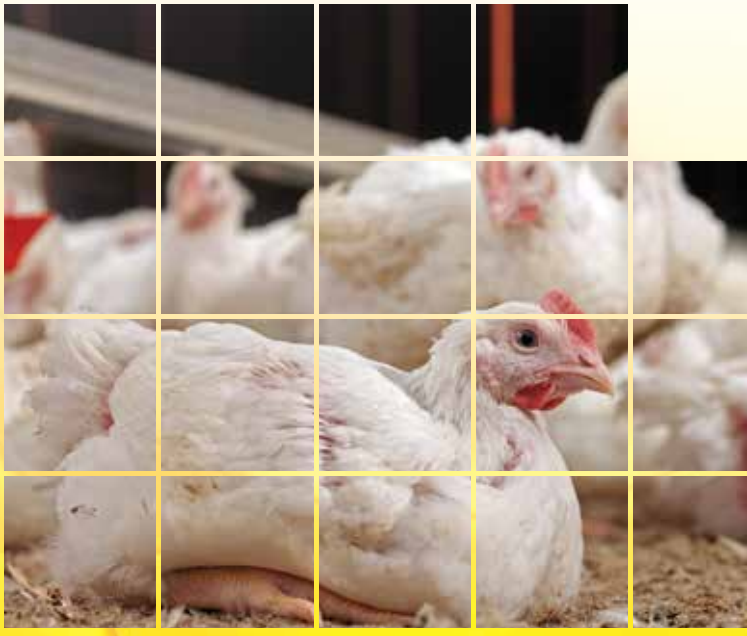

Miya-Gold®

Poultry

The unique probiotic

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PROBIOTICS

Probiotics have been defined as **live microbial** feed supplements which **beneficially** affect the host animal by improving its **intestinal microbial balance**.

Achieving a balanced gut microbiota is critical to intestinal health because of the effect of bacteria on gut morphology, nutrition, intestinal disease and immune responses.

MIYA-GOLD®

Miya-Gold® is a **probiotic feed additive** consisting of a unique genus of bacteria: **Clostridium butyricum MIYAIRI 588**. Clostridium butyricum is a gram positive, strict anaerobic, spore-forming bacterium.

MIYA-GOLD® CONSISTS OF SPORES

The spores of Clostridium butyricum protect Miya-Gold®:

- throughout feed production
- in the highly acidic upper digestive tract
- during enzymatic digestion

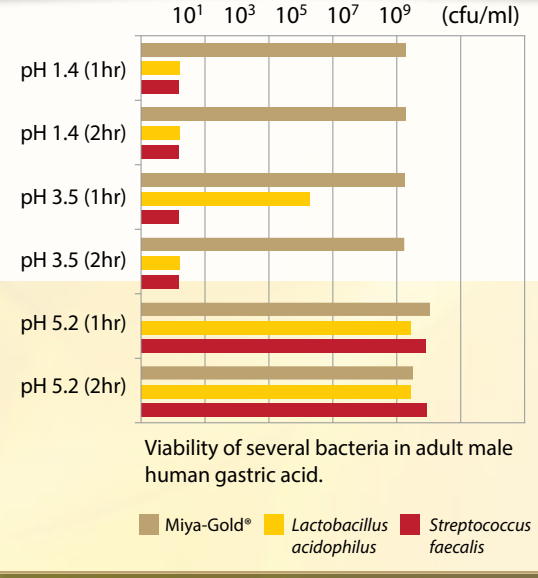
In the lower gastro-intestinal tract, the spores:

- germinate
- multiply
- temporarily colonize
- execute positive effect

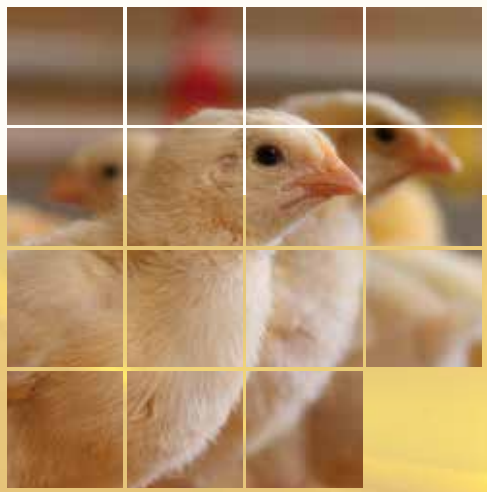
CLOSTRIDIUM BUTYRICUM

Wirtz spore stain (x 1,000), Blue=vegetative cell, Pink=spore

MIYA-GOLD® IS STABLE IN LOW PH



Viability of several bacteria in adult male human gastric acid.



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MODE OF ACTION OF MIYA-GOLD®

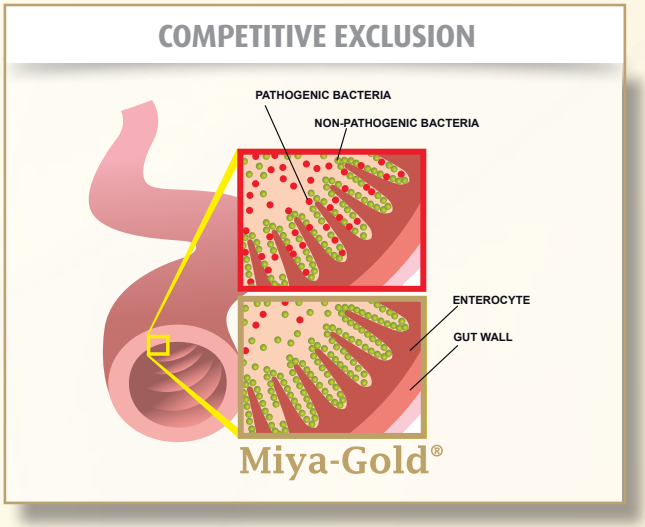
GENERAL

Miya-Gold® establishes and maintains a beneficial microbial population in the gut. This makes the gut environment less conductive to colonization by micro-organisms that may have a negative impact on animal performance.

MECHANISMS

1. Competitive exclusion

Miya-Gold® prevents colonization by pathogens through adhesion to the gut epithelium.



Benefits:

- Less colonization by pathogens
- No disruption of intestinal wall

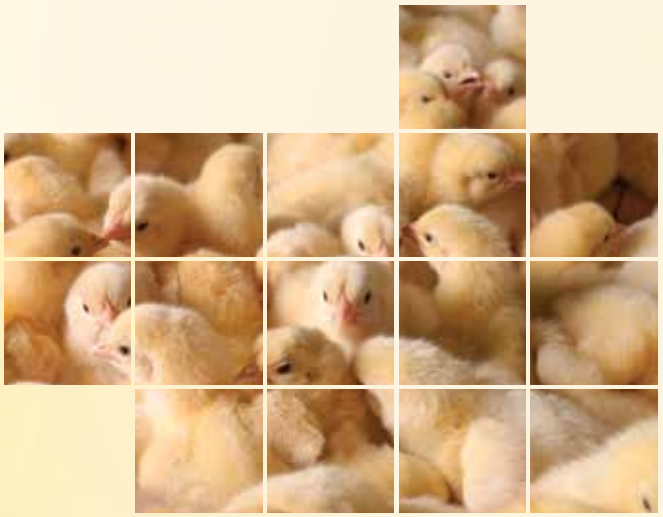
2. Antagonistic activity

Miya-Gold® demonstrates a direct antagonistic effect against several intestinal pathogens.

ANTAGONISTIC ACTIVITY	
Enterotoxigenic E. coli	Fujita, I. Et al. (1986). Jpn. Pharmacol.
Candida albicans	Chen, H.Y. (1987). Jpn. J.
Klebsiella spp.	Fujita, I. Et al. (1987). Jpn. Pharmacol.
Salmonella spp. and Vibrio spp.	Kuroiwa, T., et al. (1990). J. Jpn. Assoc.
Clostridium difficile	Kamiya, S. et al. (1997). Rev. Med. Microbiol.
Helicobacter pylori	Takahashi, M., et al. (2000). J. Med. Microbiol.
Enterohaemorrhagic E. coli	Takahashi, M., et al. (2004). FEMS Im. Med. Microbiol.

Benefits:

- Securing a healthy microflora
- Less pathogens in the gut



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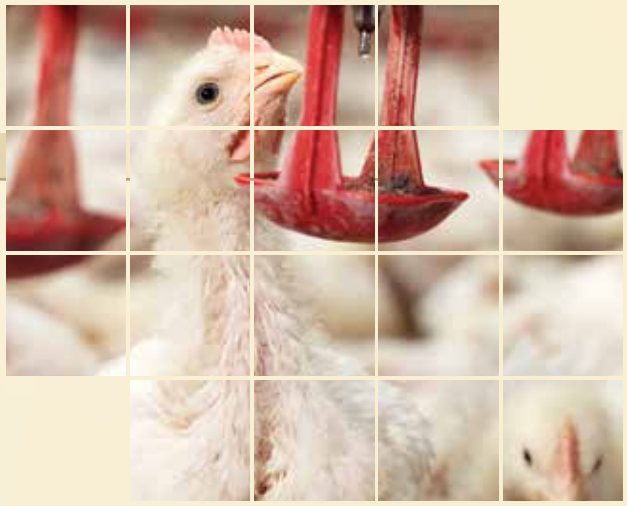
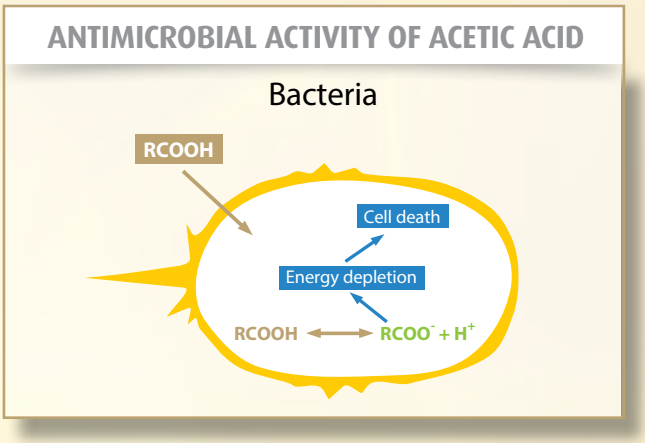
MODE OF ACTION OF MIYA-GOLD®



3. Production of acetic acid

Acetic acid produced by Miya-Gold® inhibits microbial growth by passing across the cell membrane of pathogens, dissociating and acidifying the cell cytoplasm leading to cell death.

ANTIMICROBIAL ACTIVITY OF ACETIC ACID



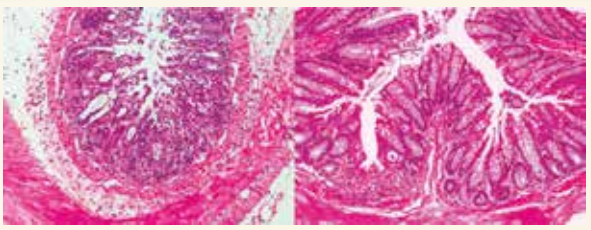
Benefits:

- Reduction of pathogens
- Acetic acid is an extra energy source for commensals

4. Production of butyric acid

Butyric acid produced by Miya-Gold® possesses antimicrobial activity and shows anti-inflammatory action. In addition butyric acid is the preferred energy source for colonocytes and exerts positive effect on jejunal and ileal epithelial cells.

MIYA-GOLD® PROTECTS THE ANIMAL AGAINST INDUCED COLITIS



Induced colitis-non treated | Induced colitis- treated with Miya-Gold®

Benefits:

- Improved gut morphology
- Direct inhibition of pathogens
- Less energy loss through inflammation

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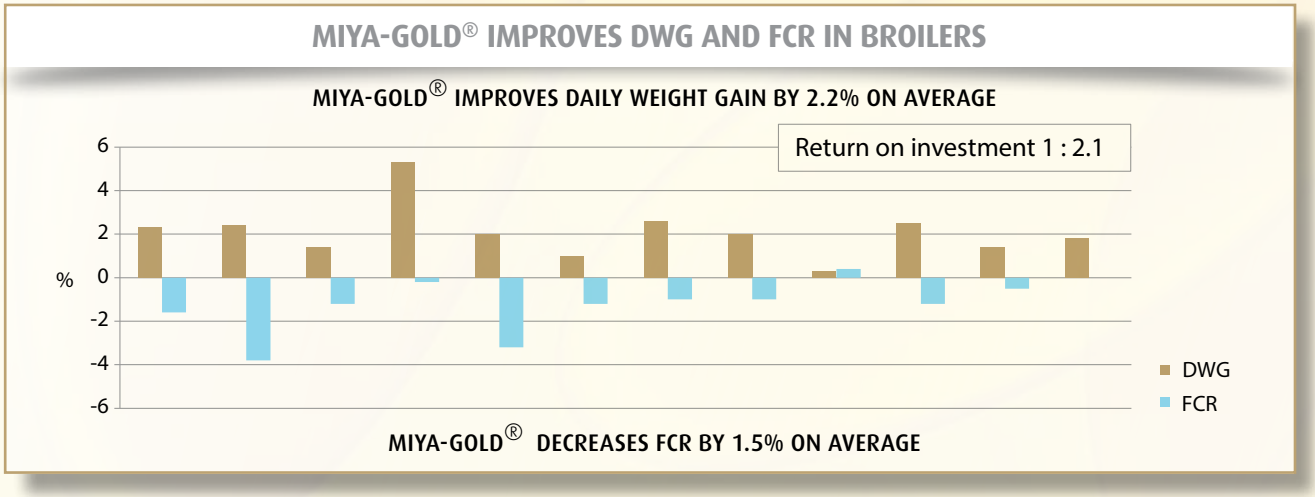
ECONOMICS OF MIYA-GOLD®

INCREASING PERFORMANCE

Miya-Gold® reduces FCR and increases daily weight gain. The improvement of the growth of the animals is achieved through a natural, physiological way, improving digestion by balancing the gut flora.

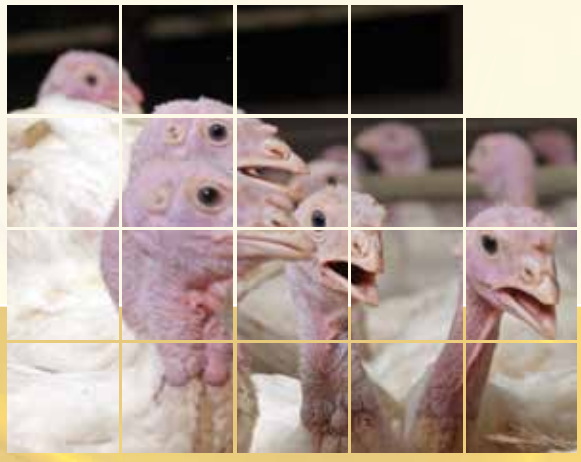
MIYA-GOLD® IMPROVES DWG AND FCR IN BROILERS



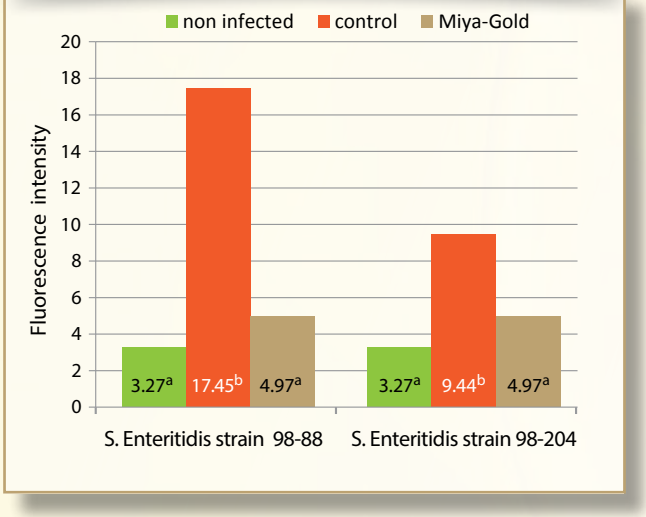
Summary of 12 European trials conducted in broilers kept under optimal management.

REDUCING PATHOGENS

Miya-Gold® supports the animal at time of stress and environmental change. In addition Miya-Gold® protects growing animals from colonization by pathogens.



MIYA-GOLD® INHIBITS ADHESION OF SALMONELLA TO EPITHELIAL CELLS



An epithelial cell line was infected with 2 zoonotic Salmonella Enteritidis strains. Non-infected and infected cells were compared to cells pre-treated with 10^7 cfu Clostridium butyricum. Fluorescence intensity is a measurement of adhesion activity of Salmonella.

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DOSE RECOMMENDATIONS

Species	cfu Clostridium butyricum/ g Miya-Gold®	Recommended dose of Miya-Gold®/mton of feed	cfu Clostridium butyricum/ mton of feed
Broilers	$5*10^8$	0.5 kg	$2.5*10^{11}$
Layers in pre-lay			
minor avian species			
Turkeys	$5*10^8$	0.25 kg	$1.25*10^{11}$
Turkeys reared for breeding			

STABILITY

Miya-Gold® can resist heat and high pressure, thus surviving the steam conditioning and pelleting process routinely used in the feed industry. Miya-Gold® has a shelf-life of 24 months.

Temperature (°C)	Duration (min)	Recovery rate (%)
60	1 5 10	100 100 100
80	1 5 10	100 63 60
95	1	98

Pellet stability of Miya-Gold® at different temperatures.

CONCLUSION

Miya-Gold®:

- **Is a probiotic feed additive**
- **Consists of Clostridium butyricum spores**
- **Increases performance**
- **Stimulates gut health**
- **Is heat stable**

Miya-Gold®

The unique probiotic

Dodává:

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Vyrábí:

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