# B-Act®

Targeted protection



HUVEPHARMA®

AgriHealth

# Characteristics

**B-Act®** is a probiotic feed additive containing viable spores of a unique *Bacillus licheniformis* strain (DSMZ 28710). The probiotic strain used in B-Act® is a Gram-positive, facultative anaerobic, spore-forming bacteria.

## B-Act® consists of spores

The *Bacillus licheniformis* spores in **B-Act®** are capable of dealing with the conditions:

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

## 1. Spore germination

When the environment is favorable, spores germinate into vegetative cells within minutes.

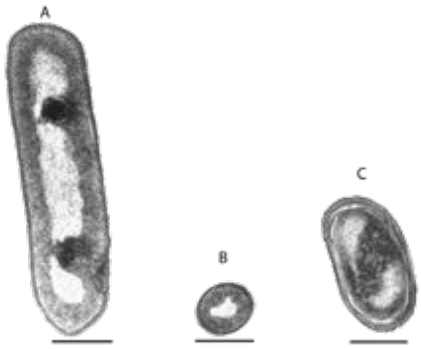
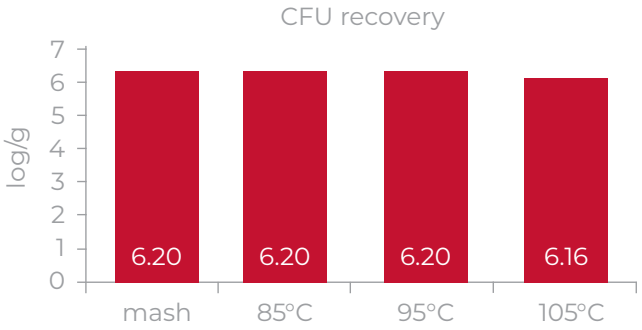



**Figure 1.** The vegetative bacterium is shown in longitudinal (A) and cross (B) sections. The dormant spore (C) is protected by several layers of highly cross-linked proteins and peptidoglycan.
American Academy of Allergy, Asthma & Immunology.

## 2. Recovery rate

**B-Act®** can resist heat and high pressure, thus surviving the steam conditioning and pelleting process routinely used in the feed industry.




**Graph 1.** Pellet stability of B-Act® at 85°C, 95°C and 105°C with a conditioning time of 90s.

## 3. Aerobic and anaerobic

Most of the digestion and absorption of nutrients occurs in the small intestine where primarily aerobic organisms are found.

Simultaneously, the vast majority of gut bacteria reside in the distal intestine. Due to the low oxygen pressure in this part of the gut, anaerobic bacteria prevail here.

As *Bacillus licheniformis* is capable of both aerobic and anaerobic respiration, **B-Act®** exerts its positive effect throughout the whole intestinal tract.



# Mode of action



## B-Act® has a multifactorial mode of action

**B-Act®** establishes and maintains a beneficial microbial population in the gut by creating a favorable environment for beneficial bacteria by means of competitive exclusion as well as direct antagonism against *Clostridium perfringens*.

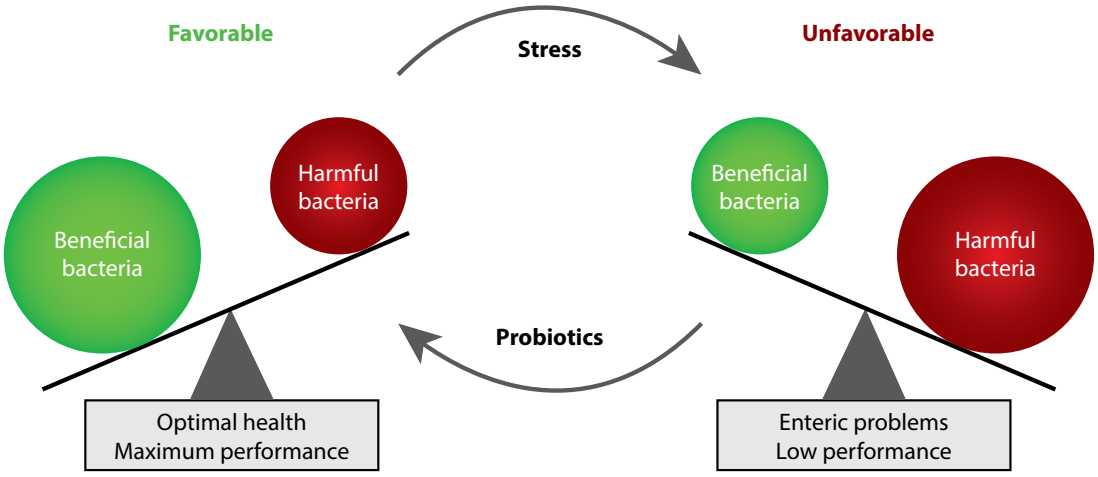
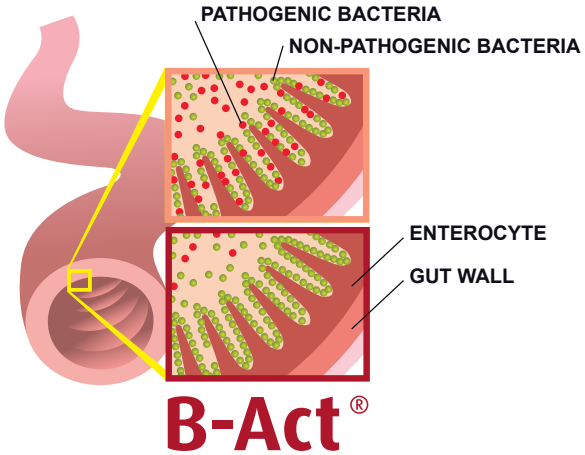



**Figure 2.** Intestinal microbiota influences both the performance and health of the host. Stress (diet, management, climate, etc.) negatively affects the delicate balance of the microflora.

## 1. Competitive exclusion

**B-Act®** colonizes intestinal mucosa, blocks the attachment and subsequent colonization by invading enteric pathogens through competition for nutrients and attachment site. This phenomenon is called competitive exclusion.




## 2. Lichenicidin

**B-Act®** produces the peptide lichenicidin, a bacteriocin selectively inhibiting the growth of *Clostridium perfringens,* the causative agent of necrotic enteritis.




**Figure 3.** A clear inhibition circle of **B-Act®** (white inner circle) on NE-associated *C. perfringens* (yellow innoculated) was shown when evaluated *in vitro*.

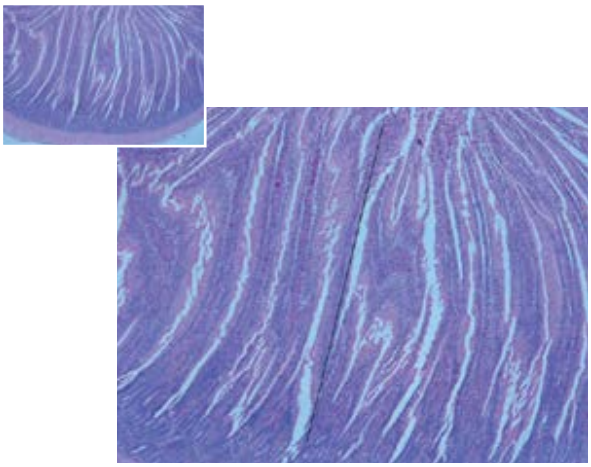
# Probiotic benefits



## B-Act® supports gut structures

By balancing the gut flora and improving gut structures, **B-Act®** supports general gut health whilst mitigating dysbiosis. Small intestinal villi are positively impacted when **B-Act®** is added to the diet, making nutrient absorption in the gastrointestinal track more efficient.

**B-Act® broiler villi**



**Control broiler villi**

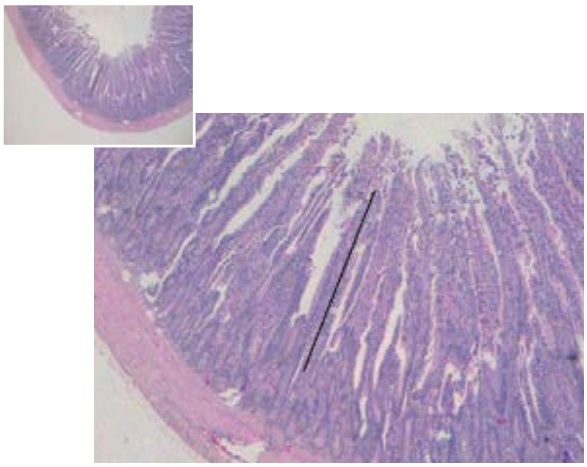
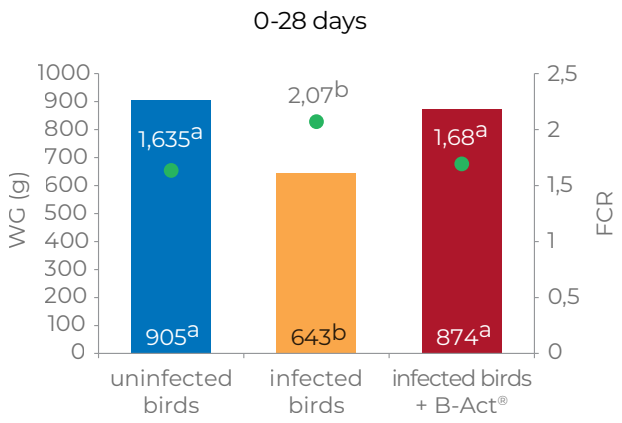
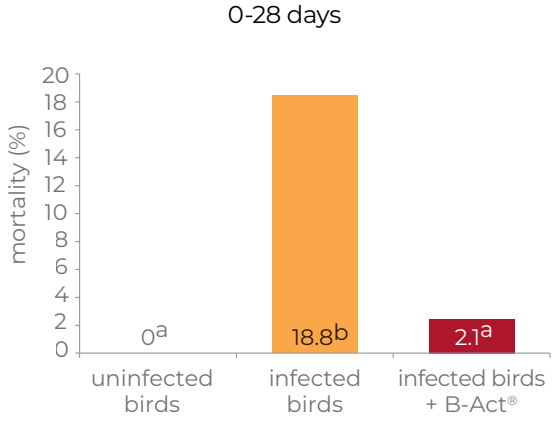


**Figure 4. B-Act®** supplemented broilers show an increase of 13% in villi height in the duodenum versus the control group. These structures are essential for nutrient absorption in the gastrointestinal tract.

## B-Act® mitigates *Clostridium perfringens* and necrotic enteritis

Broilers challenged with necrotic enteritis but supplemented with **B-Act®** show similar weight gain and FCR as unchallenged birds. Mortality due to necrotic enteritis is also significantly lower when **B-Act®** is included in the diet.



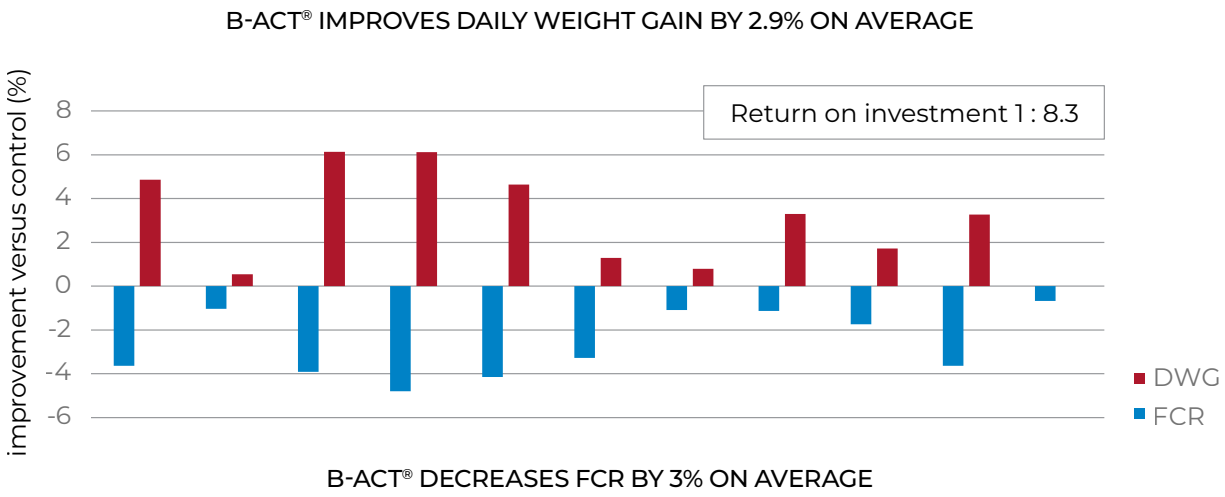




**Graphs 2-3.** 480 Cobb 500 broilers were inoculated with 5000 oocysts E. *maxima*/bird on day 13 and with $10^8$CFU *C. perfringens* on day 18, 19 and 20 to artificially induce necrotic enteritis. One group of 240 infected birds were supplemented with 0.5 kg B-Act® (equivalent to 100g B-Act 100) / ton of feed from day 1 whilst 240 broilers were not infected. Different superscripts indicate significant differences at $P<0.05$.

# Economic benefits

## B-Act® improves return on investment

By supporting general gut health, **B-Act®** improves technical performance parameters such as daily weight gain and feed efficiency, leading to an increased economic performance.




**Graph 4.** Summary of 11 broilers trials conducted under commercial conditions worldwide ROI based on 2.6 kg live weight at 42 days, cost of €275/ton feed, broiler price €1/kg.

These benefits are not restricted to broilers, with **B-Act®** also supporting high-performing laying hens. This can express itself in multiple improved parameters, such as reduced wet litter and lower FCR values. For example, three recent layer trials showed an average FCR improvement of 7 points when **B-Act®** was supplemented.



# Practical considerations



## Indications for use

**B-Act®** should be used to:

- reduce the risk of necrotic enteritis
- prevent enteric problems
- boost performance

## Species

**B-Act®** can be used safely in all poultry species reared for all uses, including laying and breeding.

## Dosing

**B-Act®** should be given preventively.

| | CFU *Bacillus licheniformis* /g B-Act® | Recommended dose of B-Act® /mton of feed | CFU *Bacillus licheniformis* /mton of feed |
|---|---|---|---|
| B-Act® 100 | $1.6 \times 10^{10}$ | 0.1 kg | $1.6 \times 10^{12}$ |
| B-Act® 500 | $3.2 \times 10^{9}$ | 0.5 kg | |

**B-Act®** is compatible with antibiotics, coccidiostats and other feed additives. It is packed in 20 kg bags with a shelf life of 24 months.

## Conclusion

**B-Act®** is a probiotic feed additive which:

- consists of viable spores of *Bacillus licheniformis*
- prevents enteric disorders in the presence of *Clostridium perfringens*
- improves return on investment
- is extremely stable




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