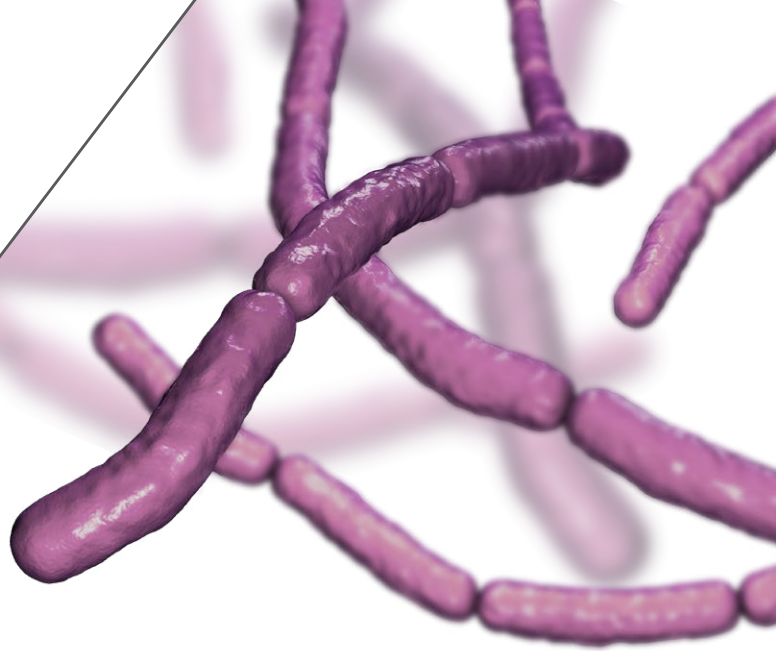


MAXBIOS

SPORE-FORMING
BACILLUS SUBTILIS



MAXBIOS is composed of *Bacillus subtilis*, a heat-stable, spore-forming bacterium resisting chemical and physical stress, e.g., pelleting, organic acids and selected coccidiostats. MAXBIOS has been proven to efficiently proliferate in the intestine of broiler and piglets. MAXBIOS modifies the intestinal environment supporting lactobacilli growth, thereby immune function and gut integrity.



ROBUST ADD-ON TO SUPPORT GUT INTEGRITY

MAXBIOS appears to be an effective alternative to the use of in-feed antibiotics. The advantages of *Bacillus* species are the formation of endospores and the resistance against chemical and physical stress, such as pelleting or long-term storage under warm conditions. These heat-stable, spore-forming living microbes produce certain enzymes and consume oxygen creating an optimal environment for lactobacilli. Lactobacilli are known to have a beneficial effect on immune function and gut integrity. In addition, MAXBIOS improves the animal performance.

Bacillus subtilis (DSM 28343; MAXBIOS) is a naturally occurring bacterial strain isolated from hay. It does not contain antibiotic-resistant genes, and it is not harmful to humans or the environment. For practical use, MAXBIOS can be combined with organic acids and selected coccidiostats.



CHARACTERISTICS

- Spore-forming bacterium
- Inhibiting *Clostridium perfringens*
- Supporting beneficial microbiota

APPLICATION BENEFITS

- Heat-stable (pelleting up to 90°C)
- Resistant (e.g., acids)
- Additive effect with MAXLAC

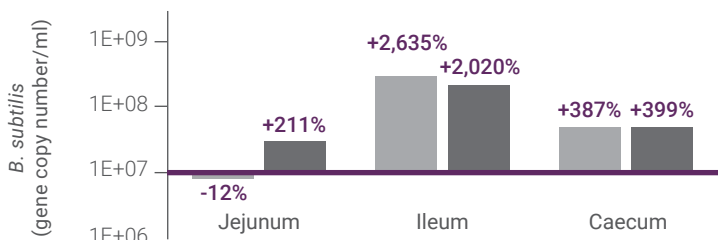
INNOVATIVE SPORE-FORMING PROBIOTIC

MAXBIOS

Model: Germination assay using broiler digesta
Methods: Digesta (n=10 broiler) and buffer (1:1 vol/vol)
B. subtilis spores (10^7 spores/ml substrate)
 Incubation at 38°C for 0, 12, 24 h; qPCR



F1: *Bacillus subtilis* germination and growth in broiler digesta¹.



¹Calculated difference (%) to *B. subtilis* gene copy number (0 h). The purple line indicates the initial *B. subtilis* gene copy number at time point 0 h.

Source: ISF, 2015.

■ 12h ■ 24h

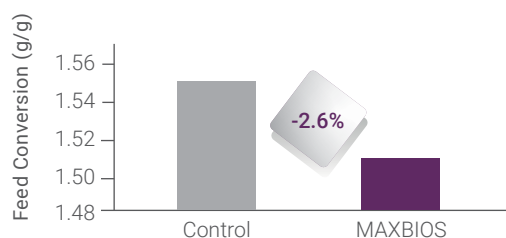
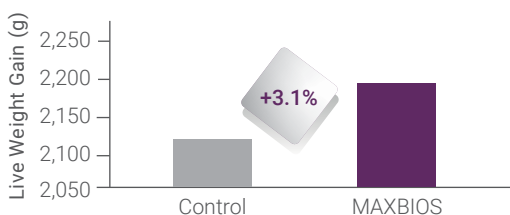
In broiler digesta (jejunum, ileum, caecum), *B. subtilis* gene copy numbers were numerically greater after 12 and 24 h incubation than before incubation (0 h), except for 12 h incubation in jejunal digesta. **The greater number of *B. subtilis* (MAXBIOS) spores indicates its proliferation in the small and large intestine of broiler in the absence of oxygen and different pH ranges.**

IMPROVED FEED CONVERSION IN BROILER AND PIGLETS

Animals: Experiment 1: Broiler (Cobb 500; 35-d trial; n=120); starter (d 1-14), grower diet (d 15-35)
 Experiment 2: Piglets (Large White x Landrasse; weaned at d 25; 42-d trial; n=14); starter (d 25-38), grower diet (d 39-66)
Treatments: Experiment 1: Control (6 pens x 20 broiler); MAXBIOS (1 x 10^9 CFU/kg compound feed)
 Experiment 2: Control (7 pens x 2 piglets); MAXBIOS (1 x 10^9 CFU/kg compound feed)



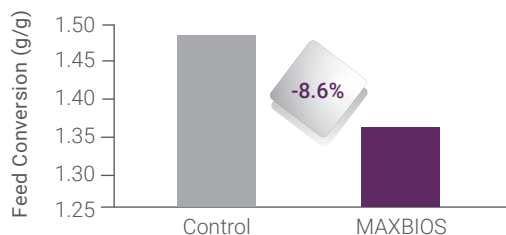
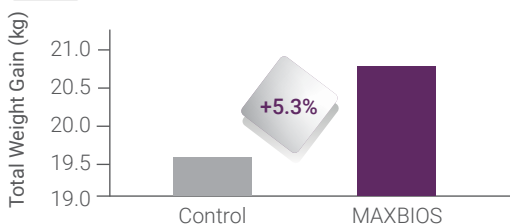
F2: Performance in broiler.



Source: FU Berlin, 2014.



F3: Performance in weaned piglets.



Source: FU Berlin, 2014.

In broiler and piglets, weight gain was numerically greater for MAXBIOS than Control, whereas feed conversion ratio was numerically lower for MAXBIOS than Control. **MAXBIOS improves the performance in broiler and piglets.**