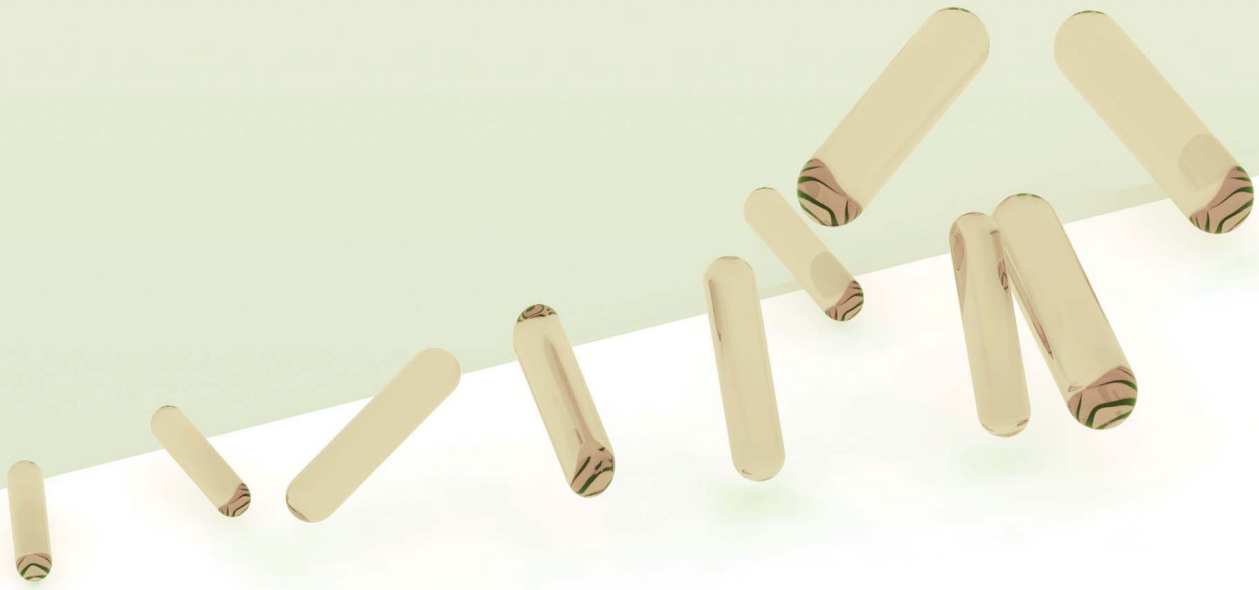




**BioCC**  
Bio-Competence Center



TECHNOLOGICAL AND  
ZOOTECNICAL ADDITIVES

**SCIENCE FOR HEALTH!**

HOMOFERMENTATIVE SILAGE ADDITIVE  
LACTIPLANTIBACILLUS PLANTARUM

# TAK 59

NCIMB 42150



Isolated from naturally ensiled legume rich (>75 %) silage.

The susceptibility to European Food Safety Authority (EFSA) required antimicrobials of human and veterinary importance tested according to ISO 10932 using micro-dilution-based assay.



Registered in  
European Union  
Feed Additive  
Register 1K20751

European Patent  
EP3027734B8 "Isolated  
microorganism strain  
*Lactobacillus plantarum* TAK  
59 NCIMB42150 and its use"

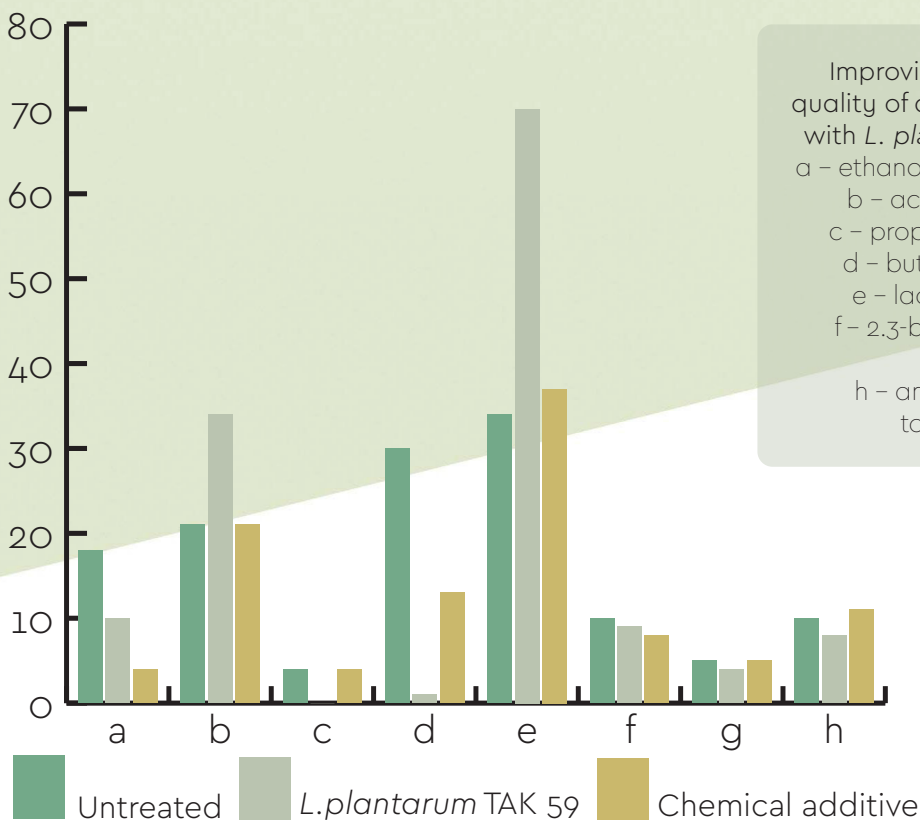
Russian Patent RU2645471  
"Isolated microorganism  
strain *Lactobacillus*  
*plantarum* TAK 59  
NCIMB42150 and its use"

Suitable for easy, moderately difficult, and difficult to ensile forages (grass-, clover-grass and alfalfa silages). Over 40 ensiling trials have been carried out in various proportions.

The inoculation ratio of microorganism is  $1 \times 10^5$  CFU/g of the fresh forage.

The silage quality is significantly improved by using of *L. plantarum* TAK 59.

The directed lactic acid fermentation resulted in lower pH, inhibition of the multiplication and impact of undesirable proteolytic/pathogenic microorganisms.



Improving the fermentation quality of difficult to ensile forage with *L. plantarum* TAK 59, where  
a – ethanol, g/kg dry matter (DM);  
b – acetic acid, g/kg DM;  
c – propionic acid, g/kg DM;  
d – butyric acid, g/kg DM;  
e – lactic acid, g/kg DM;  
f – 2,3-butanediol, g/kg DM;  
g – pH;  
h – ammonia nitrogen in total nitrogen, %.

## EFFECTS OF *L. PLANTARUM* TAK 59 NCIMB 42150

**A multivalent biopotential** – faster fermentation, better quality, better stability, and the preservation of nutrients in the silage.

Enables ensiling of different forages with **wide dry matter range**.

**Accelerates fermentation** and ensures a fast and stable pH decrease in silage.

Fast pH drop inhibits development of undesirable microorganisms and pathogens, causing **less by-products of poor fermentation** such as ammonia nitrogen and butyric acid.

**Decreases the loss of nutrients** during fermentation.

### PRODUCT CHARACTERISTICS

- *L. plantarum* TAK 59 NCIMB 42150
- Concentration:  $1.0 \times 10^{11}$  CFU/g
- Shelf life:  
+4°C – 24 months  
+20°C – 12 months
- Water soluble lyophilized powder

### RECOMMENDATION FOR USE

- Dosage: 1 g/t of fresh forage
- Range of application: grass, clover-grass, alfalfa silage: 25–45 % DM
- Suitable for using both in conventional and organic farming

### MINIMUM STORAGE PERIOD

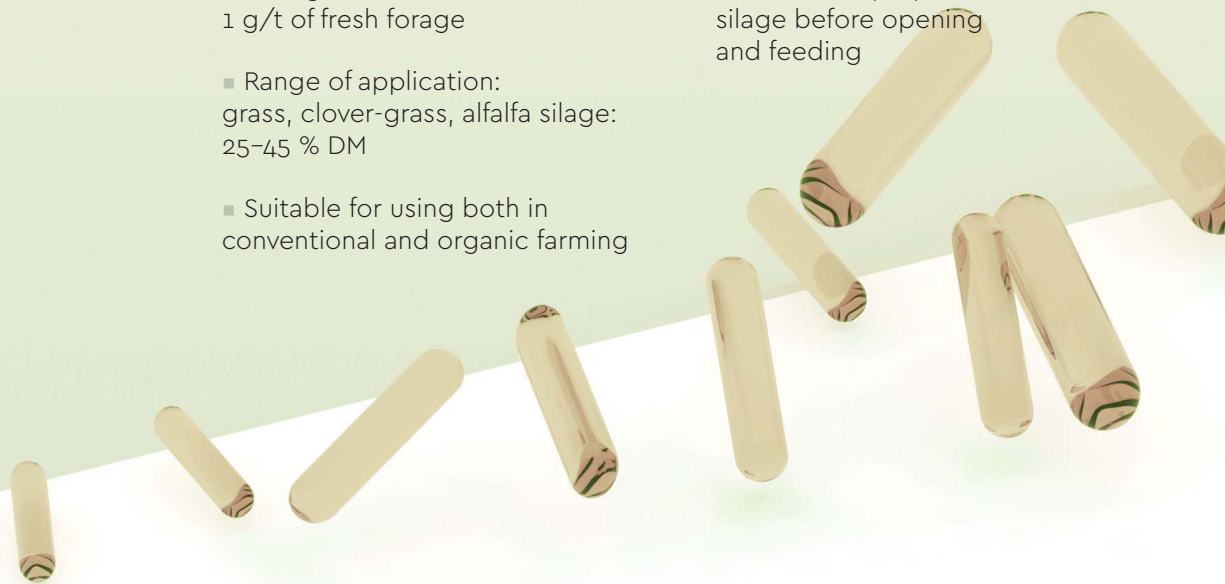
- 4 weeks of prepared silage before opening and feeding

## SAFETY OF *L. PLANTARUM* TAK 59 NCIMB 42150

The species *Lactiplantibacillus plantarum* belongs to EFSA QPS (Qualified Presumption of Safety) recommended list of biological agents intentionally added to food or feed.

The strain *L. plantarum* TAK 59 is of natural origin (from the untreated silage in Estonia) and is not harmful to the health of people or animals (authorization by EFSA).

The strain is susceptible to all antimicrobials of human and veterinary importance required by European Food Safety Authority (EFSA).



HETEROFERMENTATIVE SILAGE ADDITIVE  
*LENTILACTOBACILLUS BUCHNERI*

# BioCC 203

DSM 32650



Isolated from naturally ensiled whole crop maize silage.

The susceptibility to European Food Safety Authority (EFSA) required antimicrobials of human and veterinary importance was tested according to ISO 10932 using micro-dilution-based assay.



Registration in European Union  
Feed Additive Register is pending

European Patent EP3688139A1  
"Microorganism strains *Lactobacillus  
buchneri* BioCC 203 DSM 32650 and its use"

Suitable for easy, moderately difficult and difficult to ensile forages (grass-, clover-grass, alfalfa, whole crop & maize and corn-cob mix silages).

The inoculation ratio of microorganism is  $1 \times 10^5$  CFU/g of the fresh forage.

Fermentation parameters and aerobic stability after storage of 49 and 90 days with maize silage (Haus Riswick, Germany 2017).

	Control	BioCC 203
Dry matter, % DM	34.6	34.5
Acetic acid, g/kg DM	12	19*
1,2-propanediol, g/kg DM	1	7*
aerobic stability, days (test 49 days)	3.9	6.3*
aerobic stability, days (test 90 days)	7.9	10.6*

\*  $p \leq 0.05$

Fermentation parameters and aerobic stability after storage of 90 days with grass mixture silage (BioCC OÜ and Estonian University of Life Sciences, 2018).

	Control	BioCC 203
Dry matter, % DM	41.5	41.3
Acetic acid, g/kg DM	4.8	24*
1,2-propanediol, g/kg DM	0	14.8*
aerobic stability, days (test 49 days)	3.6	9.0*

\*  $p \leq 0.05$

## EFFECTS OF *L. BUCHNERI* BIOCC 203 DSM 32650

Intensive activity of *L. buchneri* BioCC 203 **prevents reheating the ensilable material** and thereby improves the aerobic stability of silage.

**Inhibits the growth and action of undesirable microorganisms** such as pathogenic microorganisms, yeasts, and moulds.

Enables ensiling of different forages with **wide dry matter range**.

Ensures **stable pH decrease** in silage.

Lactic acid, acetic acid, and propylene glycol produced by the strain during silage fermentation **support metabolism of dairy cows and fattening bulls**.

### PRODUCT CHARACTERISTICS

- *L. buchneri* BioCC 203 DSM 32650
- Concentration:  $1.0 \times 10^{11}$  CFU/g
- Shelf life:  
+4°C – 24 months  
+20°C – 12 months
- Water soluble lyophilized powder

### RECOMMENDATION FOR USE

- Dosage: 1 g/t of fresh forage
- Range of application: grass, clover-grass, alfalfa: 25–45% DM; whole-crop maize: 28–35% DM; whole-crop cereal 32–50% DM; CCM 58–65% DM
- Suitable for using both in conventional and organic farming

### MINIMUM STORAGE PERIOD

- 8 weeks of prepared silage before opening and feeding

## SAFETY OF *L. BUCHNERI* BIOCC 203 DSM 32650

The species *L. buchneri* belongs to EFSA QPS (Qualified Presumption of Safety) recommended list of biological agents intentionally added to food or feed.

The strain *L. buchneri* BioCC 203 is of natural origin (from the untreated silage in Estonia) and is not harmful to the health of people or animals.

The strain is susceptible to all antimicrobials of human and veterinary importance required by European Food Safety Authority (EFSA).

ANTIMICROBIAL AND ANTIOXIDATIVE PROBIOTIC  
*PEDIOCOCCUS ACIDILACTICI*

# TAK 589 CoccobEst®

DSM 32372



Zootechnical additive for the prevention of bacterial infections in the gastrointestinal tract of farm animals and pets and for the prevention and/or reduction of diarrhoea.

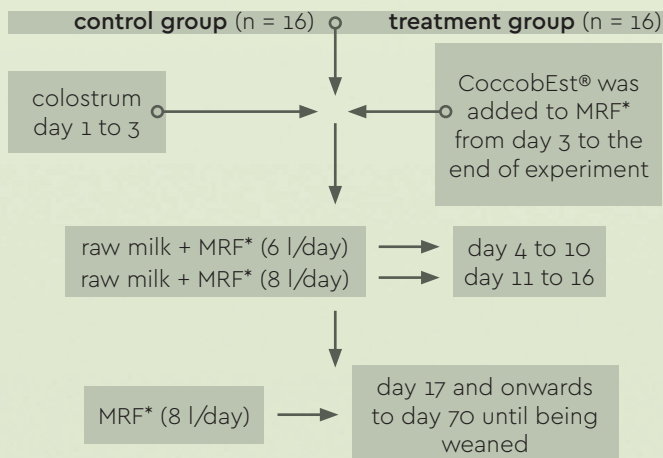
Isolated from a stool sample of a healthy calf.

The susceptibility to European Food Safety Authority (EFSA) required antimicrobials of human and veterinary importance was tested according to ISO 10932 using micro-dilution-based assay.



Patent application is pending  
"Micro-organism strain *Pediococcus acidilactici* TAK 589  
CoccobEst as an antimicrobial and antioxidative probiotic"

## EXPERIMENTAL PLAN

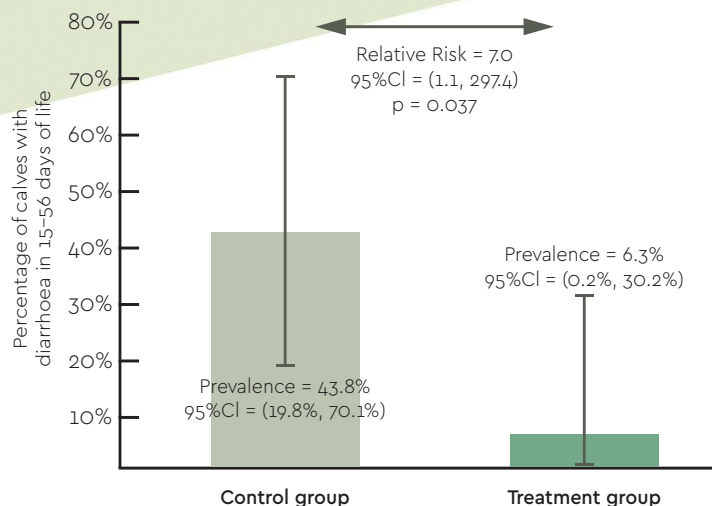


\*Milk replacer feed (20% fat, 22% crude protein of which 3/4 was casein, 47.6% lactose).

Starter feed (crude protein 23% and metabolizable energy 13,3 MJ/kg), grass hay and water were freely available during all experiment.

### The effect of CoccobEst® on the intestinal enterobacterial microbiota of calves and the incidence of diarrhoea.

Between the days 15–65 of their lives, only one test group calf out of 16 had diarrhoea (6.3%) as opposed to seven control group calves out of 16 (43.8%). Two control group calves died.



# EFFECTS OF *PEDIOCOCCUS ACIDILACTICI* TAK 589 CoccobEst®

Provides **local gastrointestinal protection** by

**Balancing** mammalian gastrointestinal **microbiota**.

Thereby helping to **prevent and / or reduce diarrhoea** and resulting severe complications including the death of young animals.

**Suppressing bacterial infections-causing** gram-negative and gram-positive enteric **pathogens** like *S. sonnei*, *E. coli*, *L. monocytogenes*, *S. enteritidis*, *S. aureus*, *S. typhimurium*, *E. faecalis* and *C. sakazakii* etc.

**Strengthening the protective barrier function** of the gastrointestinal mucosa.

Due to highly active antioxidant defence system, increasing the redox activity of glutathione and reducing oxidative stress in cell, *P. acidilactici* TAK 589 CoccobEst® **provides additional systemic (whole-body-based) protection** to the mammalian organisms through the prevention and / or reduction of excessive oxidative stress and resulting inflammatory processes.

## PRODUCT CHARACTERISTICS

- *P. acidilactici* TAK 589 CoccobEst® DSM 32372
- Concentration:  $5.0 \times 10^{10} - 1.0 \times 10^{11}$  CFU/g
- Shelf life:  
+4°C - 24 months  
+20°C - 12 months

## RECOMMENDATION FOR USE

- Dosage: can vary from  $5.0 - 8.0 \times 10^9$  CFU/kg feedingstuffs / day / head
- Other components in the composition that contains CoccobEst® can include milk replacer, raw milk, starter culture, concentrated feed, premixtures, and other components

## SAFETY OF *PEDIOCOCCUS ACIDILACTICI* TAK 589 CoccobEst®

The species *P. acidilactici* belongs to EFSA QPS (Qualified Presumption of Safety) recommended list of biological agents intentionally added to food or feed.

The strain is susceptible to all antimicrobials of human and veterinary importance required by European Food Safety Authority (EFSA).

## BioCC OÜ (LLC)

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*BioCC OÜ (BioCC LLC) is a private R&D company, established by food and feed producers and universities.*

*BioCC conforms to the requirements of EN ISO/IEC 17025:2017*



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### **INTERNATIONALLY RECOGNIZED R&D AND INNOVATIVE BIOTECHNOLOGICAL SOLUTIONS**

BioCC carries out internationally recognized R&D to create, develop and implement innovative biotechnological solutions for feed, food and food supplements, integrating its and international knowledge in the field of microbiology, biochemistry, genetics, metabolomics, genomics, physiology, and medicine.

## DISTRIBUTOR Nordwise Biotech OÜ (LLC)

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*Nordwise Biotech OÜ is a company focusing on distributing European produced clinically validated proprietary probiotics, food supplements, functional foods and feed additives.*



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**NORDWISE**<sup>®</sup>



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