

TECHNICAL INFORMATION

IDENTIFICATION

16S rDNA gene sequence analysis RAPD method

SAFETY

Included in EFSA QPS list (EFSA Journal 2017)

Absence of investigated antibiotic resistance genes (EFSA Journal, 2018, 16(3):5206)

BSE/TSE free

GMO free

Colorant free and hypoallergenic (list of allergens in compliance with Reg. UE 1169/2011)

CHARACTERISTICS

- Bile and acid tolerance >95%
- Survival in the GI tract

• Adheres to epithelial intestinal cell line HT-29. SYNBIO[®] strains, *L. rhamnosus* IMC 501[®] and *L. paracasei* IMC 502[®], showed comparable or superior adhesion to human intestinal HT-29 cells, compared to other commercial strains, in vitro.



• antimicrobial activity against pathogens, especially vs Candida albicans

| Bacterial strain | Inhibition of growth* of | | | | |
|------------------------------|--------------------------------|----------------------------------|------------------------------------|---------------------------------------|----------------------------------|
| | <i>E. coli</i> (ATCC 11775) | <i>S. aureus</i> (ATCC 25923) | <i>C. albicans</i> (ATCC 10261) | <i>C. perfringens</i> (ATCC 13124) | <i>S. mutans</i> (ATCC 20523) |
| L. rhamnosus IMC 501® | +++ | ++ | ++++ | +++ | + |
| <i>L. paracasei</i> IMC 502® | + | +++ | ++++ | +++ | + |

* Inhibition zone: + <2.0-1.5 cm; ++ <2.0-2.5 cm; +++ <2.5-3.0 cm; ++++ >2.5-3.0 cm; Reference: Verdenelli et al., 2009.

SHELF LIFE

18 months at temperature <-18°C 12 months at temperature 5±3°C

STABILITY (Log, CFU/g)

Stability studied both on the blend and on the dosage form (sachet)



L. rhamnosus IMC 501® STRAIN DEPOSIT NUMBER DSM 16104



SYNBIO[®] AND HOUSE DUST MITE ALLERGY

Allergies occur when the immune system overreacts to environmental factors that are harmless to most individuals. One of the most prevalent allergies is caused by house dust mites (HDM). Between 65-130 million people are estimated to suffer from HDM allergy worldwide. In recent decades, the incidence of allergies has increased in Western countries, which has been strongly linked to a relative lack of microbial stimulation of the immune system during infancy and excessive hygienic practices during early childhood in Western households . An innovative treatment consists of modulating the gut microbiome through probiotics, prebiotics and synbiotics to prevent allergic disease.

SYNBIO[®] can alleviate the allergy symptoms caused by house dust mites.









1:1 *L. rhamnosus* IMC 501 *L. paracasei* IMC 502 Inulin 0,115g/day



Intervention period

RESULTS

• Susceptibility

57% of subjects had reduced sensitivity to allergens after the 6 months treatment

 Allergenic symptomatology and gastrointestinal well-being statistically improved in the synbiotic treatment (P<0.05):

*statistically significant difference (P<0.05) due to the synbiotic treatment • conjunctivits

- dry eye
- lacrimation
- burning eye
- intestinal regularity
- easiness of defecation
- increase in stool volume
- bloating

- allergic cold
- fatigue
- fever
- itchiness
- cough
- nasal obstruction
- rhinorrhoea
- sneezing

• Health-related quality of life: all 30 subjects had a global score of 79±4.2 for the Psychological General Well-being Index that corresponded to a "no distress" general well-being after synbiotic treatment.

MPROVED

 Recovery of probiotic strains from fecal samples: after 6 months of synbiotic supplementation, *L. rhamnosus* IMC 501[®] and *L. paracasei* IMC 502[®] were detected with a frequency of about 93% and 87% respectively, in a sampled subset of 15 subjects.
 Reference: Cecchini et al., 2016.
 The composition of the intestinal microbiota is greatly related to the health of the host. Oral administration of probiotics is suggested to have a positive effect on people's general wellbeing, specifically, the composition of the intestinal microbiota and resistance against pathogen colonization.

SYNBIO[®] improves intestinal microbiota and prevents harmful bacteria. Moreover, it exerts a positive effect, in terms of improved bowel habits, on healthy adults.



It is well known that intense physical activity induces oxidative stress. Several studies have established that specific strains of probiotics prevent and correct oxidative stress. In vitro studies with both intact cells and intracellular cell-free extracts of *L. rhamnosus* IMC 501® and *L. paracasei* IMC 502® showed an antioxidative effect of these strains through the inhibition of lipid peroxidation.

SYNBIO[®] displays a strong antioxidant activity: athletes may benefit from the ability of these probiotics to increase antioxidant levels and neutralize the effects of reactive oxygen species.



double-blinded, randomized, placebo controlled



26-38 Years old 1x10° CFU/day

1:1 Daily dose of *L. rhamnosus* IMC 501[®] *L. paracasei* IMC 502[®] weeks

Intervention period

RESULTS

MICROBIAL ANALYSIS:

Lactobacillus count increased significantly in the probiotic group. The SYNBIO[®] strain was detected in all the subjects within the probiotic group.

CHANGES IN PLASMA REACTIVE OXIGEN METABOLITES

The control group's level of Reactive Oxygen Metabolites (ROMs) at the end of the training was significantly higher than that measured before physical activity (P<0.05), while no significant changes in ROMs were observed in the probiotic group. After exercise ROMs levels were higher in the control group compared to the probiotic group P>0.05.



PLASMA BIOLOGICAL ANTIOXIDANT POTENTIAL

In the probiotic group, the Biological Antioxidant Potential (BAP) increased after supplementation, despite physical activity (P<0.05). BAP levels were higher in the probiotic group compared to the control (P<0.01)

 SYNBIO[®] supplementation increases the plasma antioxidant levels







P<0.05, probiotic supplemented group before and after treatment.
 ** P<0.01, probiotic supplemented group and control group after treatment.

There is a heightened incidence of upper respiratory tract (URT) and gastrointestinal (GI) illness, particularly diarrhea, during intense training and competitions that may have negative consequences for athletic performance. The increase of URT infections in athletes is a demonstrated consequence of exercise-induced changes in the immune system, which create an opportunity for pathogens to establish themselves. Maintaining a healthy GI tract microbiota may possibly prevent the occurrence of infections and reduce their duration.

SYNBIO[®] supplementation improves GI well-being and reduces cold symptoms.



RESULTS

MPROVED

- Analysis revealed a signifcant increase in the faecal Lactobacillus cell counts post-treatment, in the probiotic group compared to the control
- Treatment with SYNBIO[®] significantly improved GI wellbeing and reduced cold symptoms.
 - intestinal regularity
 - stool volume
 - stool consistency
 - ease of defecation
 - borborygmi
 - bloating
 - flatulence
 - constipation
 - diarrhea
 - abdominal pain and intestinal cramps
 - cold frequency
 - tiredness



PGWBI Psychological General Well-being Index scores of probiotic group significantly differ from control group: 88.3 VS 80.5 (P<0.05)

Significantly different from pre-treatment, according to the Student's t-test (P \leq 0.05)

SYNBIO[®] improved wellbeing in male athletes, making it the perfect probiotic blend for individuals who exercise regularly in order to avoid a decline in GI and respiratory health. Reference: Verdenelli et al., 2011(b).





REFERENCES

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