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 2012;10(6):2740)
BSE/TSE free
GMO free
colorant free and hypoallergenic
(list of allergens in compliance with Reg. UE 1169/2011)

L. rhamnosus IMC 501®
STRAIN DEPOSIT NUMBER
DSM 16105

L. rhamnosus IMC 502®
STRAIN DEPOSIT NUMBER
DSM 16104

CHARACTERISTICS

• bile and acid tolerance >95%
• survival in the GI tract
• adheres to epithelial intestinal cell line HT29.
SYNBIO® strains show a superior adhesion % compared to other commercial strains.
The adhesion assay applied to a combination of L. rhamnosus IMC 501® and L. paracasei IMC 502®, showed an increased adhesion on HT29 cells.

antimicrobial activity against pathogens, especially vs C. albicans

<table>
<thead>
<tr>
<th>Bacterial strain</th>
<th>Inhibition of growthª of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E. coli (ATCC 11775)</td>
</tr>
<tr>
<td>L. rhamnosus IMC 501®</td>
<td>+++++</td>
</tr>
<tr>
<td>L. rhamnosus IMC 502®</td>
<td>+</td>
</tr>
</tbody>
</table>

ª zone of inhibition <2 x 1.5 cm, +++ zone of inhibition <2 x 2.5 cm, ++++ zone of inhibition <2 x 3 cm, ++++ +++ zone of inhibition >2.5 x 3 cm
SYNBIO® can alleviate the allergy symptoms caused by house dust mites.

Allergies are a disease of the immune system. One of the most common allergies is the house dust mites (HDM). Between 1 to 2% of the world’s population is suspected of being affected, approximately 65 to 130 million sufferers. The recent increase in allergy sufferers is observed to be a result of the relative lack of microbial stimulation of the infantile gut immune system and Western household’s exaggerated hygienic practices during early childhood. An innovative treatment consists in studying the microbiome in order to apply probiotics, prebiotics and synbiotics to prevent allergic disease.

**SYNBIO® AND HOUSE DUST MITE ALLERGY**

**SYNBIO® AND GUT HEALTH**

The health and composition of the intestinal microbiota is significantly related to the health of the host. Oral administration of probiotics is suggested to have a positive effect on general well-being; 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.**

**RESULTS**

- **improves intestinal microbiota in the probiotic group**

* Bifidobacterium
* Lactobacillus
* Clostridia
* Enterobacteria

<table>
<thead>
<tr>
<th>Culture method</th>
<th>Real-time PCR quantification</th>
<th>Culture method</th>
<th>Real-time PCR quantification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before consumption</td>
<td>8·5 ± 0·1</td>
<td>9·4 ± 0·3</td>
<td>8·2 ± 0·1</td>
</tr>
<tr>
<td>After consumption</td>
<td>10·5 ± 0·2</td>
<td>11·1 ± 0·5</td>
<td>10·3 ± 0·2</td>
</tr>
<tr>
<td>After wash-out</td>
<td>9·4 ± 0·1</td>
<td>9·8 ± 0·6</td>
<td>8·4 ± 0·2</td>
</tr>
</tbody>
</table>

- **improves bowel habits**

<table>
<thead>
<tr>
<th>Intestinal regularity (score)</th>
<th>% of subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

The graph represents the percentage of subjects recording a specific score for each parameter.

0 = worse, 10 = best.

( ) Control group, ( ) Probiotic group.

* Significantly different from control group, according to chi-square test (p<0.005).

**CLINICAL TRIAL**

Single arm

<table>
<thead>
<tr>
<th>Subjects</th>
<th>People age</th>
<th>Intervention period</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>18-41</td>
<td>6 months</td>
</tr>
</tbody>
</table>

**CLINICAL TRIAL**

Double-blinded, randomized, placebo controlled

<table>
<thead>
<tr>
<th>People age</th>
<th>Intervention period</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-65</td>
<td>12 months</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>25 PROBIOTIC</th>
<th>25 CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>L. rhamnosus</td>
<td>L. paracasei</td>
</tr>
<tr>
<td>IMC 501</td>
<td>IMC 502</td>
</tr>
</tbody>
</table>

**RESULTS**

- 50 healthy adults
- 23-65 Age
- 10x10⁹ CFU/day

- **improves intestinal microbiota**
- **improves bowel habits**

- **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.

- **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 15% and 87%
SYNBIO® AND SPORT - Effect on oxidant and antioxidant parameters

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 on inhibiting lipid peroxidation.

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

**CLINICAL STUDY**

double-blinded, randomized, placebo controlled

<table>
<thead>
<tr>
<th>24 male athletes</th>
<th>26-38 Age</th>
<th>10x10⁹ CFU/day</th>
<th>4 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 CONTROL</td>
<td>12 PROBIOTIC</td>
<td>1:1 Daily dose of <em>L. rhamnosus</em> IMC 501® and <em>L. paracasei</em> IMC 502®</td>
<td></td>
</tr>
</tbody>
</table>

**RESULTS**

**MICROBIAL ANALYSIS:**

*Lactobacillus* count increases 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 ROMs level (Reactive Oxygen Metabolites) at the end of the training was significantly higher than that measured before the physical activity p<0.05. After exercise ROMs levels were higher in the control group compared to the probiotic group p<0.05. In the probiotic group the level of ROMs before and after exercise was not different.

SYNBIO® can neutralize ROMs

**PLASMA BIOLOGICAL ANTIOXIDANT POTENTIAL**

In the probiotic group 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 increase the plasma antioxidant levels

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.

SYNBIO® AND SPORT - Effect on respiratory and gastrointestinal symptoms in athletes

There is a heightened incidence of upper respiratory tract (URTI) and gastrointestinal (GI) illness, particularly diarrhea, during heavy training and competitions that may have negative consequences for athletic performance.

The increase in URTI in athletes is a demonstrated consequence of exercise-induced changes in the immune system, which creates an opportunity for pathogens to establish themselves. Maintaining a healthy GI tract microbiota may possibly prevent and/or treat these illnesses.

**CLINICAL STUDY**

double-blinded, randomized, placebo controlled

<table>
<thead>
<tr>
<th>160 male cyclists</th>
<th>29-41 Age</th>
<th>10x10⁹ CFU/day</th>
<th>12 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 CONTROL</td>
<td>80 PROBIOTIC</td>
<td>1:1 Daily dose of <em>L. rhamnosus</em> IMC 501® and <em>L. paracasei</em> IMC 502®</td>
<td></td>
</tr>
</tbody>
</table>

**RESULTS**

• analysis revealed a significant increase in the probiotic group’s *Lactobacillus* presence post-treatment.

• treatment improved GI well-being 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

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.
REFERENCES


