



## Gut Health for Overall Wellbeing

Gut health and its impact on overall wellbeing are key drivers for today's consumers.

Increasingly, pre-clinical and clinical research supports the importance of gut health in a wide variety of conditions, from digestive health to mental health and many conditions in between.

### INVESTIGATING THE GUT MICROBIOME AND ITS ROLE IN OVERALL WELLBEING

Our cutting-edge microbiome solutions portfolio is stronger than ever, with our proprietary probiotic strain to address inflammation in the gut.

With ADM, you will benefit from the most advanced microbiome research capabilities, from DNA sequencing to *C. elegans* testing models, which isolate the most efficient strains and elaborate the best microbiome solutions.

60% of consumers recognize that digestive health leads to overall health<sup>1</sup>

51% of consumers consider digestive health the key reason for turning to probiotics<sup>1</sup>

52% of consumers are proactively seeking digestive health products to promote overall wellness<sup>1</sup>

# Studying Microbiome Solutions with ADM's Proprietary *Bifidobacterium longum* CECT 7347

ADM's proprietary *Bifidobacterium longum* CECT 7347 strain has a powerful anti-inflammatory effect demonstrated throughout its portfolio of pre-clinical and clinical evidence.

*Bifidobacterium longum* CECT 7347 is a probiotic strain isolated from healthy breast-fed infants. Pre-clinical trials and human clinical trials demonstrate the anti-inflammatory and microbiome-modulating effects of this strain.<sup>2,3</sup>

## Anti-Inflammatory and Microbiome-Modulating Effects of *Bifidobacterium longum* CECT 7347

### 1. Capacity to protect gut barrier integrity

- Increases the width of the villi of the intestine and the height of the enterocytes in an enteropathy animal model.<sup>4</sup>
- Decreases the expression of TNF- $\alpha$  in intestinal epithelial cells exposed to gliadins digested by *B. longum* CECT 7347.<sup>5</sup> TNF- $\alpha$  is increased in people suffering from chronic intestinal inflammation and is related to barrier defects at high levels.
- Offers stability under acidic and bile salt conditions to ensure viability during GI transit.

>50% survival at pH 2; >60% survival at 3% bile salts<sup>6</sup>

### 2. Shown to exert anti-inflammatory effects in multiple models of inflammation

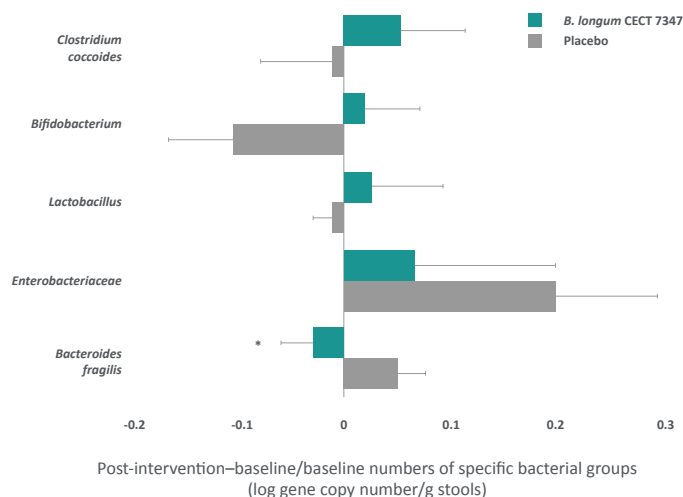
- In a pre-clinical model of inflammation, *Bifidobacterium longum* CECT 7347 significantly reduced levels of the pro-inflammatory agents IFN- $\gamma$  and TNF- $\alpha$ , associated with tissue damage and inflammation.<sup>7</sup>
- In an *in vitro* model of human cell inflammation, *Bifidobacterium longum* CECT 7347 reduced pro-inflammatory markers and increased the level of the anti-inflammatory cytokine IL-10.<sup>8</sup>
- *Bifidobacterium longum* CECT 7347 decreases oxidative stress in *C. elegans* model, increasing its survival under this stress.<sup>9</sup>

Oxidative stress is intimately involved in the upregulation of inflammatory cytokines; both processes are simultaneously found in many pathological conditions.<sup>10</sup>

### 3. Shown to modulate gut microbiome composition

- *In vitro* the strain has been shown to inhibit the growth of pathogenic species of the digestive tract, including *Clostridium difficile* isolates.<sup>6</sup>
- In a clinical trial on children with newly diagnosed celiac disease, administration of *Bifidobacterium longum* CECT 7347 was associated with a significant decrease in the opportunistic pathogen *Bacteroides fragilis*.<sup>11</sup>

Inhibits growth of *C. difficile*<sup>6</sup> and decreases *B. fragilis*.<sup>11</sup>



# Published Clinical Trial Evidence: Human Clinical Trials

A double-blind, randomized, placebo-controlled intervention trial to evaluate the effects of *Bifidobacterium longum* CECT 7347 in children with newly diagnosed coeliac disease<sup>11</sup>

## DESIGN:

Double-blind placebo-controlled design. 36 children newly-diagnosed with celiac disease, a disease characterized by intestinal inflammation, intestinal dysbiosis and an altered intestinal structure.

## INTERVENTION:

*Bifidobacterium longum* CECT 7347 1B CFU/day for 12 weeks.

## RESULTS:

- Greater height percentile increases in the *Bifidobacterium longum* CECT 7347 group compared to placebo group (P=0.048).
- Decreased peripheral CD3+ T lymphocytes in the *Bifidobacterium longum* CECT 7347 group compared to placebo (P=0.004).
- **Comparison between the groups showed that the administration of *Bifidobacterium longum* CECT 7347 reduced the numbers of the opportunistic pathogen *Bacteroides fragilis* (P=0.020) and the concentration of secretory IgA in stools (P=0.011) compared to the placebo group.**

A pilot study on non-celiac gluten sensitivity: effects of *Bifidobacterium longum* CECT 7347 co-administered with a gluten-free diet<sup>3</sup>

## DESIGN:

Non-randomized, open label study. 30 participants with symptoms attributable to non-celiac gluten sensitivity (NCGS).

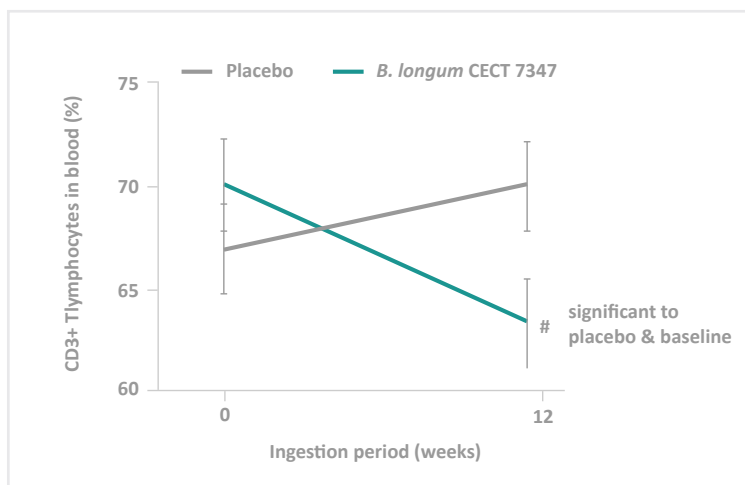
## INTERVENTION:

*Bifidobacterium longum* CECT 7347

## RESULTS:

A combination of gluten-free diet plus *Bifidobacterium longum* CECT 7347 resulted in significant improvements in the frequency and intensity of digestive and extra-intestinal symptoms:

- **Improvements in multiple outcome measures including abdominal pain, abdominal swelling and constipation, compared to baseline.**



# More Applications, More Benefits

Through pre-clinical discovery and clinical validation, ADM has a depth and breadth of expertise to support our growing range of cutting-edge microbiome solutions, including *Bifidobacterium longum* CECT 7347 – Gut Health.



## CLAIMS AND CERTIFICATIONS

- EU Permitted | QPS List
- GRAS
- Non-GMO
- Organic Compliant
- Gluten Free
- Kosher

### The Right Products

Composition	Concentration
<i>Bifidobacterium longum</i> CECT 7347	50B CFU/g

## SOURCES

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- <sup>2</sup> Genovés, S., et al. (2016) *Nutrafoods*. 15: 157–60
- <sup>3</sup> Di Pierro, F. et al. (2020) *Minerva Gastroenterol Dietol*. DOI:10.23736/S1121-421X.20.02673-2
- <sup>4</sup> Laparra, J. M., et al. (2012) *PloS one*. 7(2): e30744
- <sup>5</sup> Laparra, J.M. and Sanz, Y. (2010) *J. Cell Biochem*. 109(4): 801-7
- <sup>6</sup> Sanz, Y., et al. (2009) Patent WO 2009/080862 A1; Izquierdo, E., Medina, M., Ennahar, S. et al
- <sup>7</sup> Medina, M., et al. (2008). *J Inflamm*. DOI:10.1186/1476-9255-5-19
- <sup>8</sup> De Palma, G., et al. (2012) *J Leukoc Biol*. DOI:10.1189/jlb.1111581
- <sup>9</sup> Valcarce, D.G., et al. (2017) *Benef Microbes*. 8(2): 193-206
- <sup>10</sup> Biswas, S.K. (2016) *Oxidative Medicine and Cellular Longevity*. 2016: Article ID 5698931
- <sup>11</sup> Olivares, M., et al. (2014) *Br J Nutr*. 112: 30–40

## ADM DELIVERS FOR YOU

As part of ADM, one of the world’s largest agricultural processors and food ingredient providers, ADM Health & Wellness offers an extensive range of microbiome solutions.

An innovative leader in the microbiome field, ADM delivers future-forward nutrition fueled by science, with a complete range of solutions from prebiotic to probiotic and postbiotic strains, all clinically documented to deliver consumer benefits.

An expansive pantry of health & wellness ingredients including probiotics, botanical extracts, vitamins, minerals and more means you can deliver innovative, science-driven supplements and food & beverage formulations to meet consumers’ evolving functional nutrition needs. With our vertically integrated supply chain to ensure the reliability and availability of high-quality products and our dependable customer service, you get industry-leading quality solutions to ensure your success.

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