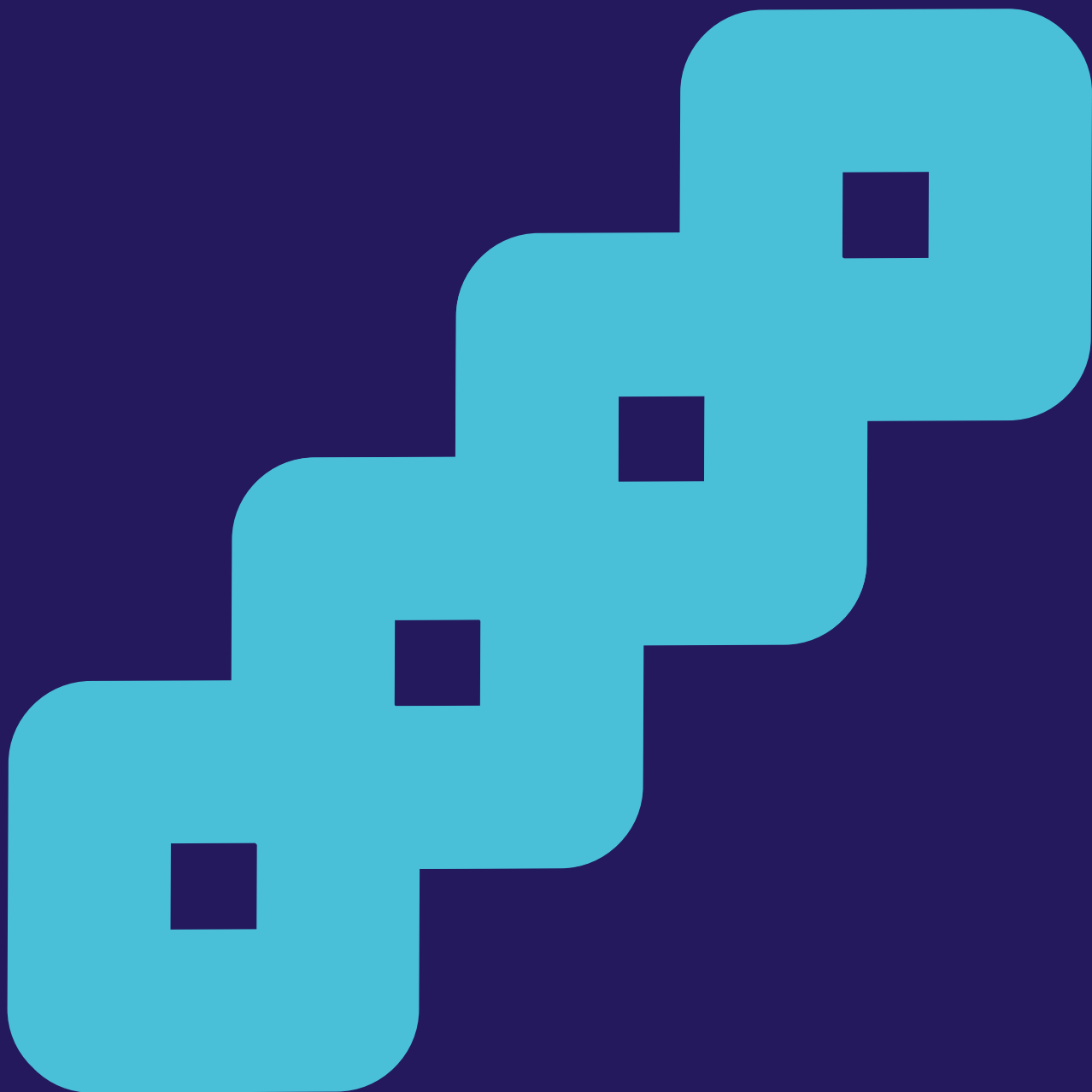


# *Probiotics+* **IBS & Intestinal Health**



The widest range of benefits



# *Probiotics+* **IBS & Intestinal Health**

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## Irritable Bowel Syndrome and Related Intestinal Health Conditions

Irritable Bowel Syndrome (IBS) is a common gastrointestinal disorder that affects both the small and large intestine. It is characterised by a combination of symptoms, including abdominal pain of varying frequency and severity, bloating, and altered bowel habit, which includes both diarrhoea and constipation, which may alternate between episodes. Collectively, these symptoms can significantly impact quality of life.

IBS is prevalent, with an estimated 5-20% of adults affected to some extent, although some cases may be mild, with bloating and altered bowel habit the main symptoms. More than 65% of IBS sufferers are women.

The exact cause of IBS is unknown, but the gut microbiome is thought to play a crucial and pervasive role. Dysbiosis, or an unhealthy gut microbiome, can lead to altered gut motility, increased gas production, and heightened sensitivity to pain, all of which are associated with IBS. Emotional and psychological factors (including stress) may also contribute to symptoms.

### The Role of Probiotics in IBS

Probiotics are proxies for the most beneficial members of our microbiome and can positively impact people suffering from IBS. These beneficial bacteria help restore a balanced microbiome, alleviating IBS symptoms such as bloating, by replacing gas producing bacteria with acid producing probiotic strains, and diarrhoea and constipation, by normalising bowel habit.

- 4 published randomised placebo-controlled clinical studies on IBS or IBS-type symptoms all showing significant benefits
- 2 clinical studies on Irritable Bowel Syndrome in sufferers
- 2 studies on gastrointestinal 'IBS-type' symptoms in athletes
- Lab4 Probiotics has shown an impact on symptoms throughout the intestinal tract at a clinically effective dose of 25 billion

*Microbiologists Dr. Nigel Plummer and Dr. Sue Plummer established Cultech Ltd in 1994 with the vision for a company with research at its heart.*





# Studies

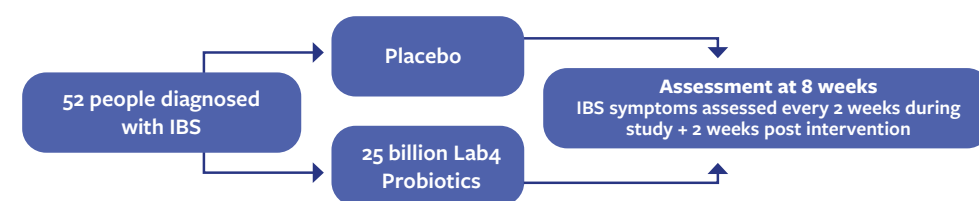
## The Evidence for Lab4 Effectiveness for IBS

Lab4 has shown consistent and significant reduction of IBS symptoms in both diagnosed IBS sufferers and endurance athletes (runners) who commonly exhibit almost classical IBS symptoms.

### The Sheffield IBS Study

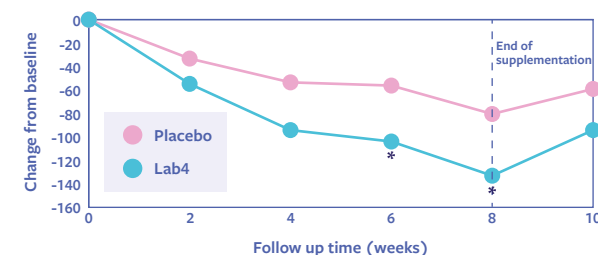
The first study with Lab4 Probiotics carried out with IBS patients was undertaken by Sheffield University Medical School.

This randomised, double-blind, placebo-controlled study investigated the effect of supplementation with Lab4 Probiotics on the symptoms of IBS.



### Results

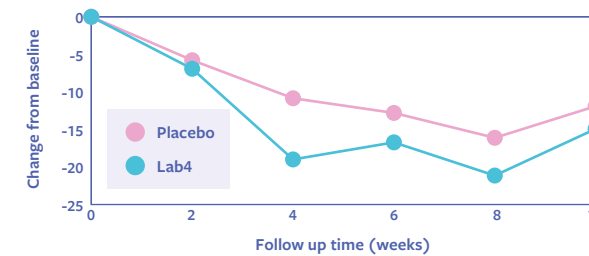
#### Total IBS Symptom Severity Score



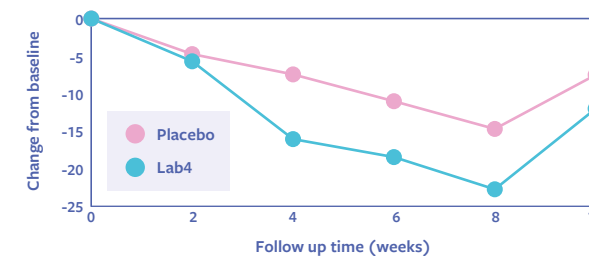
- Participants taking Lab4 Probiotics showed significant reduction in total IBS symptoms compared to placebo (\* $P < 0.05$ ), including:
- days with pain
  - severity of pain
  - days with bloating
  - dissatisfaction with bowel habit
  - quality of life

### Results

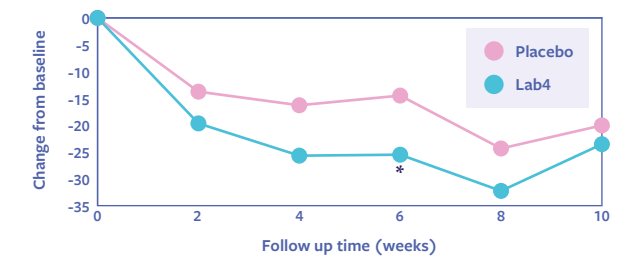
#### Abdominal Pain



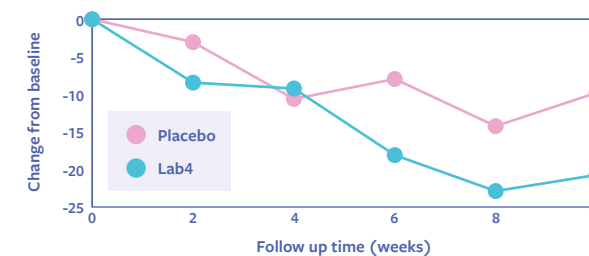
#### Bloating



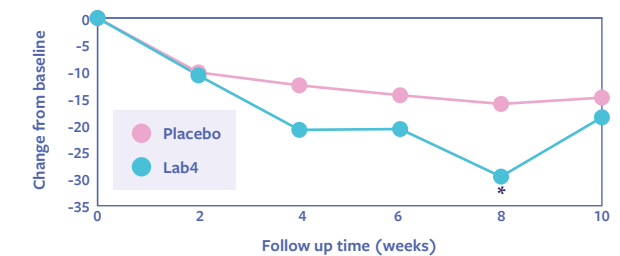
#### Dissatisfaction with Bowel Habit



#### Days with Pain



#### Quality of Life



- The days with pain and days with bloating both reduced in the group taking the Lab4 Probiotics.

- Dissatisfaction with bowel habits decreased significantly and quality of life significantly improved in the Lab4 Probiotics group.

### Conclusion

Lab4 Probiotics significantly reduced total symptoms and improved quality of life in diagnosed IBS sufferers. Continued supplementation was considered necessary to sustain this improvement.

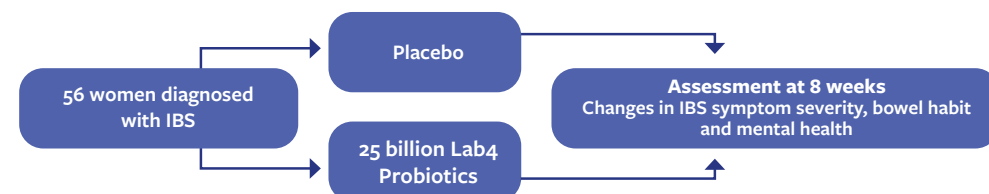


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# The IBS in Women Study ➤

The second study investigating the use of Lab4 Probiotics in IBS sufferers focused on women as there is a notably higher incidence of IBS in women compared to men.

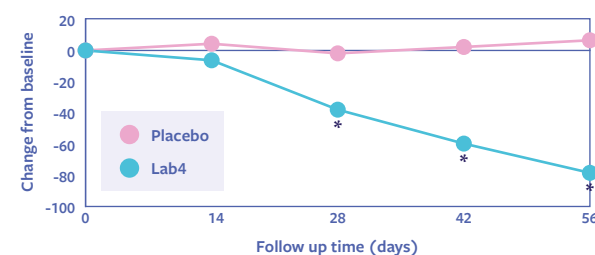
This randomised, double-blind, placebo-controlled study was designed to confirm the beneficial effect of Lab4 Probiotics on IBS symptoms in women aged 18 to 40 years.



## Results ➤

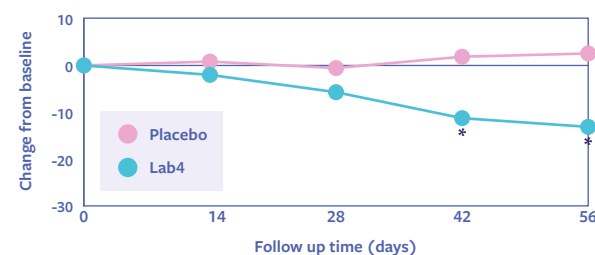
### IBS Symptoms

#### Total IBS Symptom Severity Score

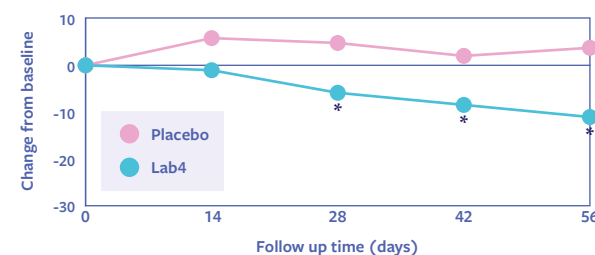


- During the 8-week study, a significant reduction in total IBS symptom scores was observed in women supplemented with Lab4 Probiotics compared to those taking a placebo (\* $P=0.0018$ ), (\* $P<0.0001$ ).
- Reductions  $\geq 50$  points are considered clinically meaningful and by the end of this study 63% of the women taking Lab4 Probiotics achieved this level of reduction in symptom severity (compared to only 4% in the placebo group).

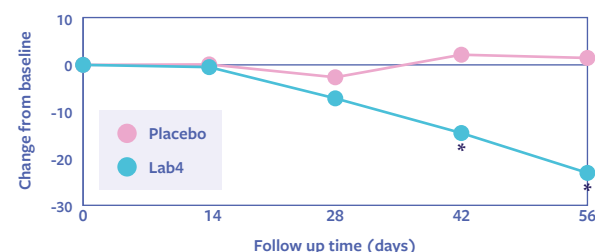
#### Quality of Life



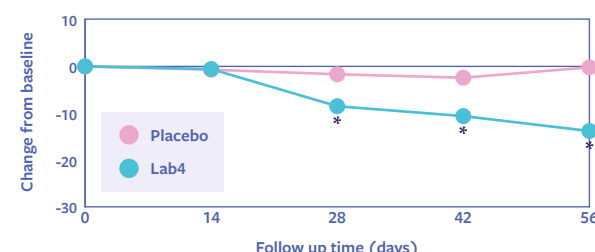
#### Bloating



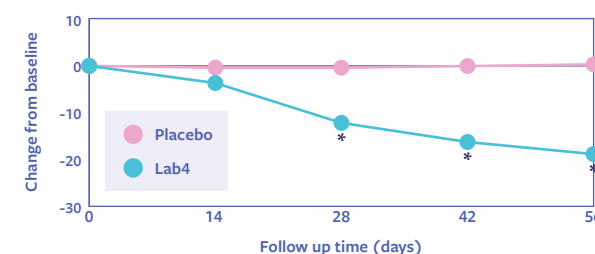
#### Dissatisfaction with Bowel Habit



#### Days with Abdominal Pain



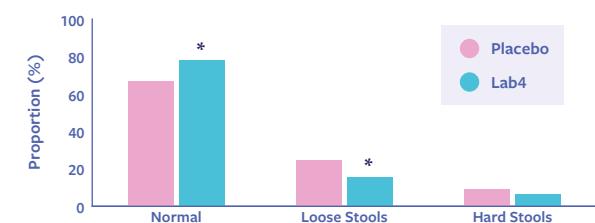
#### Abdominal pain



- In the Lab4 Probiotics group, the reduction in the IBS-symptom severity score was associated with significantly fewer days with abdominal pain, reduced pain and bloating severity, and improvements in bowel habit satisfaction and overall well-being and quality of life.

### Bowel Habits

#### Bowel Habits



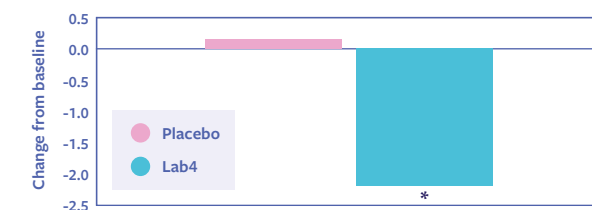
- The proportion of women with normal stool consistency in the Lab4 group was significantly higher than in the placebo group (\* $P=0.0106$ ).
- The Lab4 group experienced fewer loose stools (\* $P=0.0311$ ).

### Anxiety, Depression and IBS-related behaviour

#### Anxiety Score



#### Depression Score



#### Avoidance and Control Behaviour



- Significant reductions in both anxiety and depression scores were observed in the group taking Lab4 Probiotics compared to the placebo group (\* $P=0.0002$  and \* $P<0.0001$ , respectively).
- Lab4 supplementation significantly reduced IBS-related avoidance and control behaviour, such as food anxieties and the avoidance of social situations (\* $P=0.0002$ ).

## Conclusion ➤

This second study builds on the results of the first within a specific female cohort, demonstrating the benefits of Lab4 Probiotics supplementation in the management of IBS.



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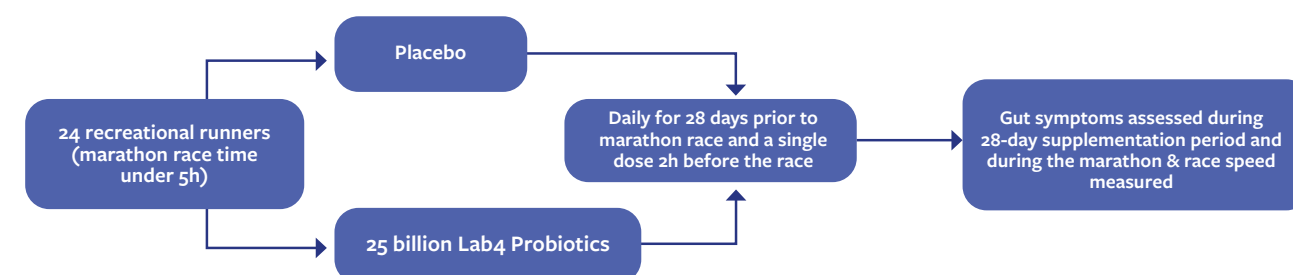
# Studies

## Lab4 and IBS-type Symptoms in Endurance Athletes

Endurance athletes, especially middle- and long-distance runners, frequently exhibit symptoms which are very similar to IBS. Adverse gastrointestinal tract symptoms during training or competing have a frequency of over 30%. As such, they make an excellent cohort to study as adults who have these symptoms but are otherwise healthy.

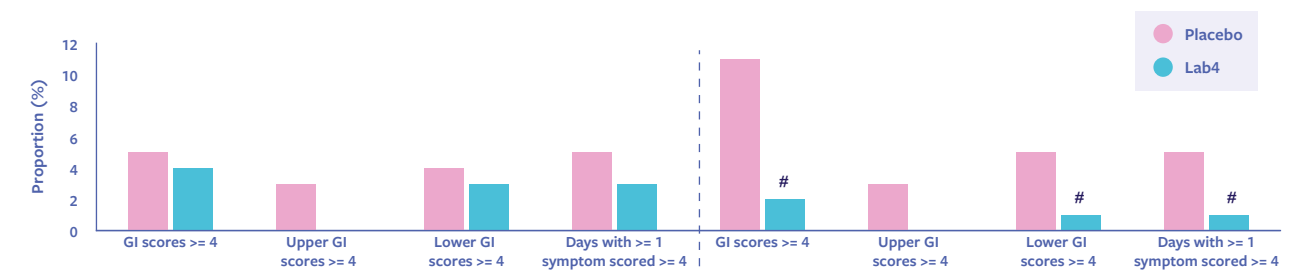
## The Marathon Endurance Study

This randomised, double-blind, placebo-controlled study assessed the effect of Lab4 Probiotics supplementation on gut symptoms, race time, intestinal permeability and immunological markers during marathon training and racing.



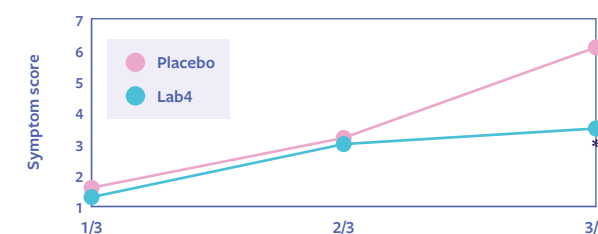
## Results

### GI symptoms reported during 28-day supplementation



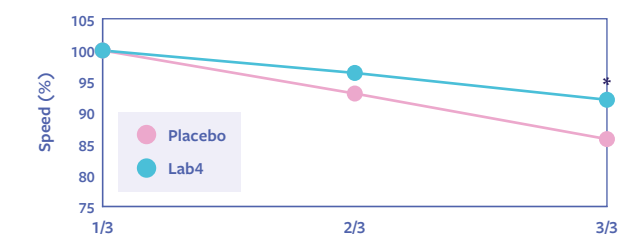
- The number of moderate gut symptoms and number of days with these symptoms were significantly reduced in the last 14 days of Lab4 Probiotics supplementation compared to the first two weeks (#  $P < 0.05$ ).

### Gut symptom scores during each third of the race



- A significant reduction in the severity of gut symptoms was seen in the Lab4 Probiotics group compared to the placebo group (\* $P = 0.01$ ) during the final third of the race.
- A significant association was observed between gut symptoms during the race and reductions in running speed, especially towards the later stage of the race.

### Running speed during each third of the race



- The reduction in average running speed from the first to the last third of the race was significantly greater in the placebo group (14.2% reduction) compared to the group taking Lab4 Probiotics (8% reduction, \* $P = 0.03$ ).

## Conclusion

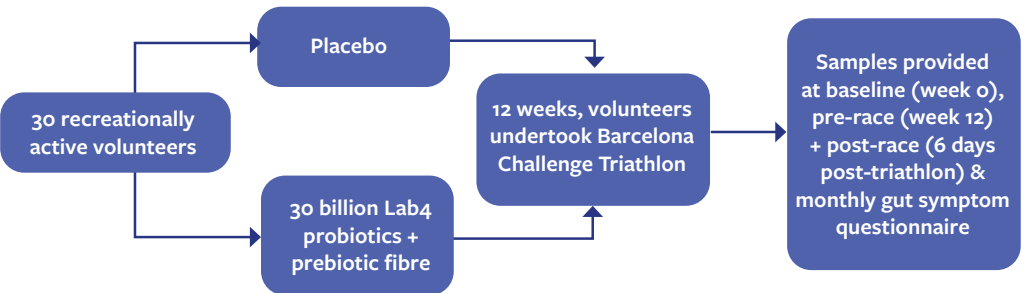
Lab4 Probiotics supplementation protected endurance runners from gut disturbances during a marathon race and supported maintenance of running pace during the latter stages of the race.



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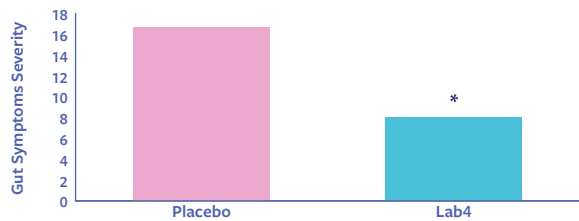
# The Hertfordshire Study >

This randomised, double-blind, placebo-controlled study aimed to assess the effect of a 12-week Lab4 probiotic/prebiotic intervention on gut symptoms, endotoxin levels, intestinal permeability and race time in recreational athletes.



## Results >

### Gut Disturbance



- Gut symptom severity scores during training were significantly lower in the Lab4 Probiotics group compared to placebo (\* $P < 0.001$ ).
- Gut disturbance symptoms include:
  - Bloating
  - Nausea
  - Stomach/intestinal pain or discomfort
  - Cramping
  - Headaches
  - Dizziness
  - Constipation
  - Diarrhoea
  - Belching
  - Urge to urinate and defecate

## Conclusion >

Lab4 Probiotics protected athletes from gut disturbances during endurance training.



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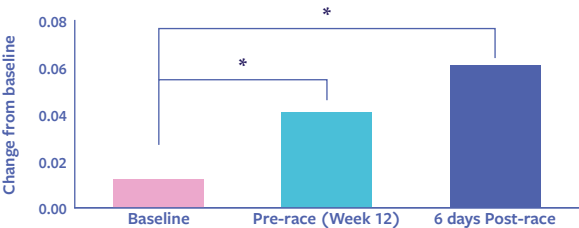
# Other Intestinal Health Benefits of Lab4

Lab4 Probiotics have also shown associated benefits for gastrointestinal health, including the two key areas of intestinal permeability and endotoxicity.

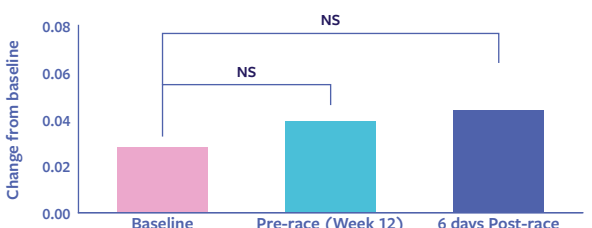
## Intestinal Permeability >

The intestinal barrier is the first line of defence, protecting against harmful pathogens and toxins, whilst allowing essential nutrients, electrolytes and water to pass through. Intestinal permeability is a sign of a perturbed gut barrier function. We used a standard Lactulose:Mannitol (L:M) test to assess intestinal permeability in triathletes.

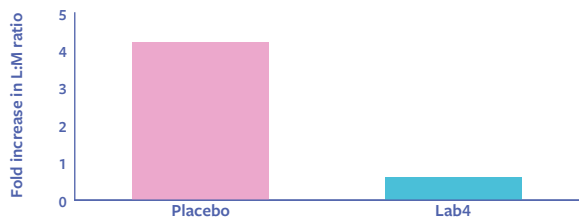
### Placebo Group L:M Ratio



### Lab4 Group L:M Ratio



### Lactulose:Mannitol Ratio

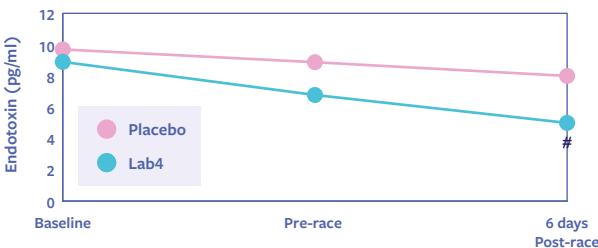


- Altered intestinal permeability was only observed in the placebo group, where the L:M ratio significantly increased from baseline to pre-race and six days post-race (\* $P < 0.05$ ).
- This represents a 4.2 fold increase compared to a 0.6 fold increase in the Lab4 Probiotics group.

## Endotoxicity >

Endotoxins are substances produced by gram-negative bacteria in the digestive tract, which may contribute to digestive symptoms. We investigated their production in triathletes and measured plasma endotoxin levels in triathletes during training and racing.

### Plasma Endotoxin



- Endotoxin levels were significantly reduced in the Lab4 Probiotics group, six days post-race compared to the start levels (# $P < 0.05$ ).
- This represented an overall 43.9% reduction in endotoxin levels.
- No changes in endotoxin levels were observed in the placebo group.



## A multitude of benefits

- Lab4 Probiotics has shown simultaneous benefits on digestive health, immune function, athletic performance, gut-brain axis, and alongside antibiotic use
- The Lab4 consortia are adapted to the human gut with demonstrable ability to survive stomach acidity and bile acids and to colonise epithelial tissue and mucous
- Lab4 has a shelf-life up to 24 months in ambient conditions\*

## Why Lab4 Probiotics Work

### One body system

The gut and hence the microbiome are extensively connected to almost all of the other physiological systems of the body, this includes the immune system, endocrine system, brain and central nervous system, and metabolic physiology.

### Proxies for microbes

Consequently, as proxies for our microbiome, effective probiotics could also impact beneficially on these distant physiologies – and these benefits may be manifest simultaneously as the intestinal health benefits outlined above.

### Bacterial colonisation

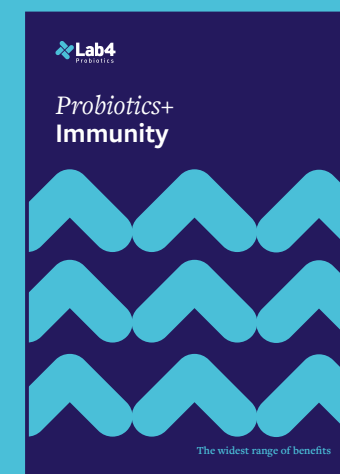
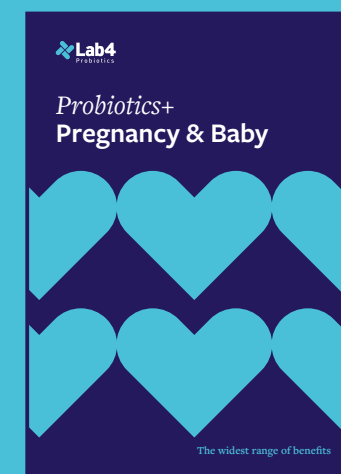
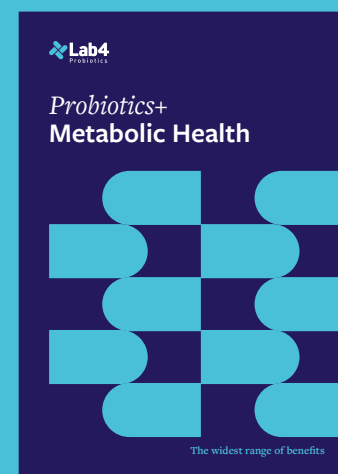
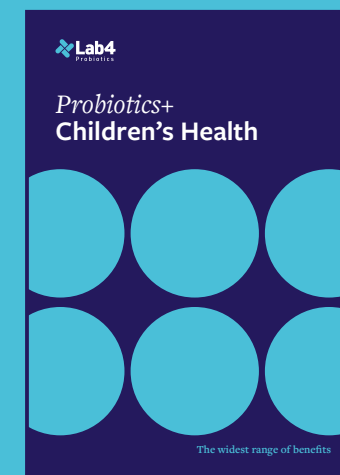
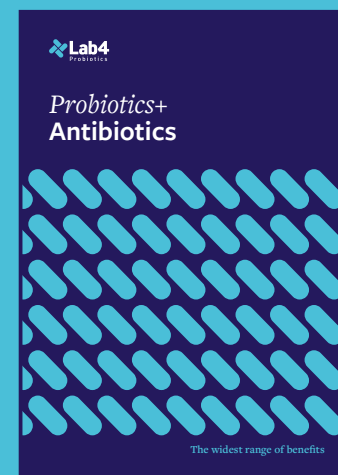
Lab4 contains *Lactobacillus acidophilus* (two strains) as well as *Bifidobacterium animalis* subsp. *lactis* and *Bifidobacterium bifidum*. The Lactobacilli are dominant colonisers of the sparsely populated small intestine and the Bifidobacteria constitute a significant population in the distal small intestine and are also present throughout the large intestine.

### High dose

Over the past 30 years it has become evident that higher doses of effective probiotic strains produce faster, greater and more consistent effects and benefits. In all clinical studies on adults performed to date, Lab4 has been supplemented at 25 billion a day. This is why we have seen a broad range of consistent health benefits across a wide range of conditions and particularly with intestinal health.

\*In powder and capsule products produced and packed appropriately

## See our other Guides



## Lab4 Specification

Lab4 Probiotics blends are available as freeze-dried concentrated powders at various concentrations. Please contact us for more details at [info@lab4probiotics.co.uk](mailto:info@lab4probiotics.co.uk) or on 01639 825100  
[www.lab4probiotics.co.uk](http://www.lab4probiotics.co.uk)

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