

# SIBO - WHEN THE GUT IS MISCOLONISED



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***biovis'***  
DIAGNOSTICS



**BACTERIA FROM  
THE LARGE INTESTINE  
INCREASINGLY  
COLONISE THE  
SMALL INTESTINE.**

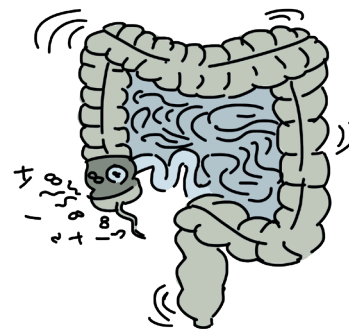
## **SIBO**

Our gastrointestinal tract is home to trillions of microorganisms, collectively known as the gut microbiome. While most of these microorganisms are found in the large intestine, an overgrowth of bacteria in the small intestine leads to a condition called small intestinal bacterial overgrowth (SIBO).

The small intestine and the large intestine are separated by a valve, which helps prevent improper colonisation. Additionally, cells in the small intestine release antibiotic substances to inhibit bacterial growth. When one or both of these protective mechanisms fail, it can result in bacterial overgrowth. The prevalence of SIBO is estimated to be between 0-20 %, and it is believed that many cases remain undiagnosed due to often unclear symptoms. Women, older adults, and certain risk groups are more frequently affected.

### **THESE RISK FACTORS INCLUDE:**

- mechanical changes (e.g. small intestinal tumour, bowel obstruction)
- chronic diseases (metabolic syndrome, diabetes mellitus)
- slowed bowel movements
- irritable bowel syndrome
- certain medications (e.g. opiates, proton pump inhibitors)
- diseases with inadequate food intake (e.g. chronic inflammatory bowel disease, coeliac disease, or carbohydrate malabsorption)
- weakened intestinal defence mechanisms



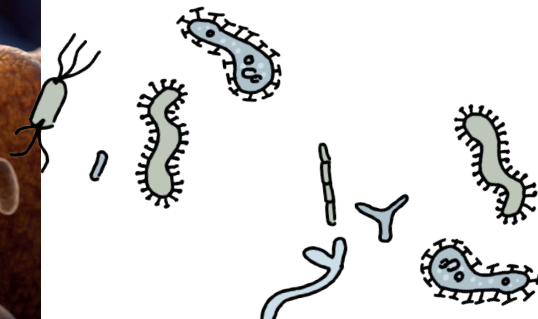
**SMALL INTESTINAL  
CELLS SECRETE  
ANTIBIOTIC  
SUBSTANCES.**





**IN THE CASE OF SIBO, BACTERIA IN THE SMALL INTESTINE ENCOUNTER UNDIGESTED FOOD COMPONENTS.**

In the small intestine, specific enzymes break down the primary components of food: carbohydrates, fats, and proteins as well as certain vitamins and minerals. These components are then absorbed through the intestinal wall into the body. In healthy individuals, any remaining indigestible components proceed to the large intestine, where only these residues are available for bacterial breakdown. However, in cases of SIBO, bacteria encounter significant quantities of undigested primary food components in the small intestine. Carbohydrates, especially, but also fats, serve as significant sources of energy for these bacteria. They metabolise these components into hydrogen, methane, carbon dioxide, and short-chain fatty acids. These metabolic byproducts can lead to symptoms such as flatulence or abdominal pain.



#### **COMMON SYMPTOMS:**

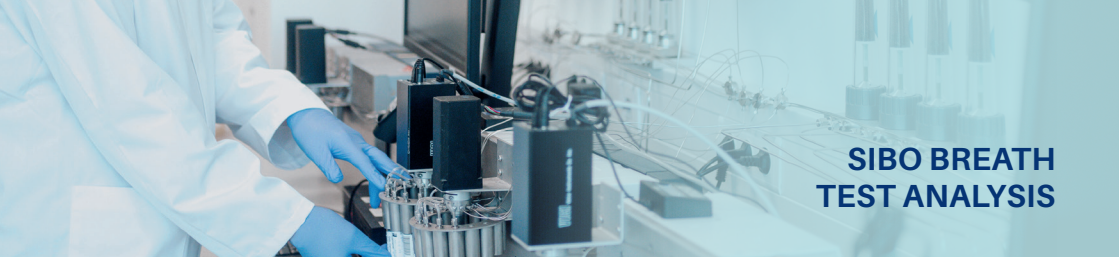
- severe abdominal pain
- abdominal cramps
- diarrhoea
- constipation
- flatulence

#### **FURTHER POSSIBLE SYMPTOMS:**

- depression
- migraines
- headaches
- general exhaustion
- poor ability to concentrate
- sleep disorders



**SIBO CAN PROMOTE INFLAMMATORY REACTIONS.**



## SIBO BREATH TEST ANALYSIS

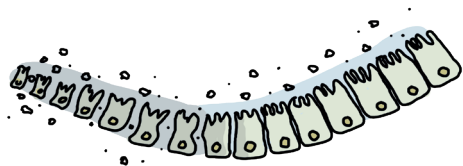
### DIAGNOSTICS

Bacterial overgrowth can be effectively detected with a SIBO breath test. The basic profile includes a breath gas analysis using either lactulose or glucose as the test substance. This test is reliable and easy to perform. The miscolonised bacteria produce hydrogen and methane from the ingested sugar, which can then be measured in the breath gas.

### DIGESTION AND MUCOUS MEMBRANE:

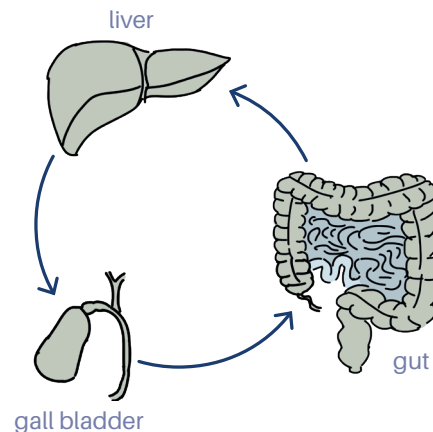
SIBO can promote inflammatory reactions, which can damage the intestinal villi and mucosa. This intestinal damage leads to compromised digestion, thereby reducing nutrient absorption. It can also result in leaky gut syndrome, where the intestinal mucosa becomes more permeable to undigested food components, toxins, and pathogens such as bacteria. Indications of poor digestion can be identified through digestive residues found in stool samples. Markers like calprotectin and  $\alpha$ -1-antitrypsin indicate inflammation, while zonulin can detect increased intestinal per-

meability. All these parameters are included in the **'SIBO Midi Profile'**.



### BILE ACIDS:

Bile acids play a crucial role in digesting fats and absorbing fat-soluble vitamins. They are produced in the liver and stored in the gallbladder. These acids follow a cycle, being released from the gallbladder into the intestine and then returning to the liver after they have been reabsorbed. SIBO can damage the intestinal mucosa, impairing the reabsorption of said bile acids. This results in a loss of bile acids from the circulation. A deficiency in bile acids can lead to decreased absorption of essential fats and fat-soluble vitamins. Because of reduced reabsorption, bile acids remain in the small intestine longer, where bacteria chemically alter them into secondary and free bile acids, which can further harm the intestinal cells. Bile acid levels can be determined through stool samples, allowing for the detection of both bile acid loss and subsequent deficiency.



### GET TESTED AT BIOVIS NOW:

DIGESTIVE  
RESIDUES

INFLAMMATION  
MARKERS

DEFICIENCY  
AND LOSS OF  
BILE ACIDS

LEAKY  
GUT

### MICRONUTRIENT DEFICIENCIES:

Reduced nutrient absorption can lead to micronutrient deficiencies. Therefore, it is important to check vitamin and mineral status if abnormalities are found. We have compiled all the important vitamins and minerals for you in the '**SIBO Complete Profile**'.



GET TESTED AT BIOVIS NOW:



If the lactose breath test is positive, products with a high lactose content should be avoided in order to prevent further damage to the intestinal mucosa. Lactase supplements can be used to help with lactose digestion.

**IS THERE A  
DEFICIENCY OF  
THE ENZYME LACTASE?**

### SECONDARY LACTOSE INTOLERANCE:

Damage to the small intestine's mucous membrane can result in a deficiency of the enzyme lactase, causing secondary lactose intolerance. Affected individuals cannot fully digest lactose. Lactose intolerance can be easily detected using a lactose breath test. If diagnosed, it is recommended to avoid foods with high lactose content.

**SIBO AND IRRITABLE BOWEL  
SYNDROME OFTEN HAVE  
SIMILAR SYMPTOMS.**



### RULING OUT SIBO IN CASE OF IBS

The symptoms of SIBO often resemble those of irritable bowel syndrome (IBS), with many symptoms being quite nonspecific. This similarity makes it challenging to differentiate between the two conditions. Therefore, it is important to rule out SIBO in patients diagnosed with IBS. For more information about irritable bowel syndrome, please visit our homepage or consult your healthcare provider.



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## WHAT TREATMENT OPTIONS ARE AVAILABLE?

If the cause of SIBO is a mechanical problem, such as an intestinal obstruction or a tumour, the mechanical cause is treated. If this is not the case, conventional medicine concentrates on eliminating the incorrect colonisation using antibiotics. However, antibiotics often lead to recurring symptoms and thus cause the same problems that the therapy was supposed to reduce.

A specific dietary intervention is also frequently used. The **FODMAP diet** is suitable as a temporary diet. A FODMAP diet contains significantly fewer fermentable foods than a wholefood diet. It is low in fibre and contains no alcohol sugar or sweeteners that can be fermented by the intestinal bacteria. This deprives the bacteria of food, preventing them from growing and spreading. The use of probiotics can also have a positive effect.

For further information, please visit our homepage, where you will find a flyer on the FODMAP diet.

- F** → Fermentable
- O** → Oligosaccharides
- D** → Disaccharides
- M** → Monosaccharides
- A** → And
- P** → Polyols

## BIOVIS OFFERS YOU



To uncover the underlying causes of SIBO, biovis offers comprehensive analyses that go beyond individual parameters and the **SIBO Basic Profile**. Our profiles address the various factors contributing to SIBO, providing a thorough understanding of your condition. For more information, please contact your trusted healthcare professional.



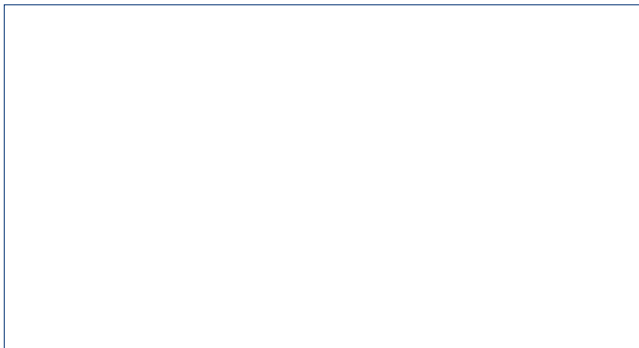


If you have any further questions, please contact the medical professionals you trust.



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Practice stamp

Further information  
can be found here:



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