

# Breath-Tests and Digestive Problems

When some bacteria digest (or ferment) food substances, they produce acids, water and gases. The major gases which are produced by bacteria include, primarily, carbon dioxide (CO<sub>2</sub>), hydrogen (H<sub>2</sub>), methane (CH<sub>4</sub>) and small concentrations of aromatic gases. Carbon dioxide is produced by all cells during metabolism, but only bacteria can produce H<sub>2</sub> and CH<sub>4</sub> as metabolic by-products, and this is accomplished primarily by bacteria which thrive in the absence of oxygen (called anaerobic bacteria). So, if either H<sub>2</sub> or CH<sub>4</sub> are produced biologically, it tells us that some food substance is exposed to bacterial fermentation.

In the digestive tract, bacteria are normally limited to the colon. Most of the bacteria contained in food are killed by the acidity of the stomach, so the small intestine usually has few bacteria. In some conditions, called “bacterial overgrowth”, bacteria exist in high concentrations in the small intestine. Their presence in that area can interfere with the absorption of some vitamins and other essential foodstuffs, so it is important to diagnose the condition.

The colon is concerned with conserving water and salt by reabsorbing them from the luminal contents. However, the colon is involved in other functions, some of which depend on having a high bacterial-count. Fiber, very popular in breakfast cereals, is not digested in the small intestine, so it undergoes bacterial fermentation in the colon. Short-chain fatty acids (SCFA) produced by that process are absorbed in the colon, and are beneficial to health. It is becoming apparent that substantial amounts of starch (10-20% of foods like legumes) escape digestion in the small intestine and are broken down in the colon, thus, adding to the efficiency of energy production by such food-stuffs.

In addition, colonic bacteria contribute to fecal bulk, and the short-chain fatty acids mentioned above reduce colonic pH. These factors may reduce the likelihood of diarrhea, confer some degree of protection against other severe colon problems, and enhance the colonic absorption of metal ions like calcium, magnesium and zinc. Thus, fermentation in the colon is normal, and it is important.

Gases which are produced in the colon are reabsorbed and equilibrated with the blood leaving that area. They appear in the lung and cross the capillary membrane into the alveoli, from which they are expired during breathing. The alveolar air can be collected with QuinTron collection devices and analyzed on BreathTracker or MicroLyzer instrument.



## Small Intestinal Bacterial Overgrowth Breath Test

### BEFORE YOU START THE TEST

Please read all directions and familiarize yourself with the test procedures.  
The test results will be useful only if the samples are properly collected.  
This test is intended for individuals over 25 lbs.



**Do not insert your finger into the tube holder of the EasySampler at any time; it contains a sharp needle.**



**Do not loosen or remove the tops of the vacuum-sealed collection tubes; this will destroy the vacuum and make the tubes useless for this test.**

### KIT CONTENTS

- EasySampler™ with tube holder
- Labels for the collection tubes
- 10 - Vacuum-sealed collection tubes
- 10 gram dose of Lactulose



### TIME NEEDED FOR TESTING

- This test will take 3 hours to complete.
- After collecting a baseline sample and drinking the solution, each breath sample will be collected in 20 minute intervals throughout the test period.
- Please schedule your time appropriately.

## PREPARATION FOR THE TEST

### Review the additional enclosed *Preparation Guidelines* prior to performing this test!

**Any recent antibiotic treatment, barium study, colonoscopy, or similar conditions can affect the test; therefore, DO NOT perform this test within 14 days of any of these conditions.**

- Avoid foods listed in the *Preparation Guidelines* sheet 12 hours prior to fasting.
- No smoking, including second-hand smoke, for at least 1 hour before or at any time during the test.
- No sleeping or vigorous exercise for at least 1 hour before or at any time during the test.
- With the exception of water, do not eat/drink anything while fasting or during the test! This can cause false-positive readings or cause your test to be unreadable.
- Suggested meals prior to fasting are located in the *Preparation Guidelines* sheet.
- If you are on any medication or special diets that conflict with these test instructions, it is recommended to speak with your physician before performing this test.

## Prepare Test Solution - DO NOT DRINK YET!!!

1. Mix the lactulose into 8-10 ounces of water.
2. Set drink aside, you will consume the solution after you collect your baseline sample.

SAMPLE CHART

| Sample   | Collection Time      |
|----------|----------------------|
| Baseline | Before drinking      |
| #1       | 20 min. after drink  |
| #2       | 40 min. after drink  |
| #3       | 60 min. after drink  |
| #4       | 80 min. after drink  |
| #5       | 100 min. after drink |
| #6       | 120 min. after drink |
| #7       | 140 min. after drink |
| #8       | 160 min. after drink |
| #9       | 180 min. after drink |

## PERFORMING THE TEST (Collection Steps)

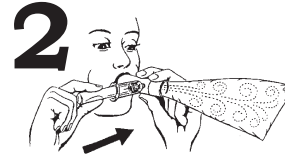
Collect your baseline sample following steps 1-4.



Hold the EasySampler device in one hand and a collection tube in the other hand.

**You will only exhale once per each sample collection.**

Take a normal (*not deep*) breath in; close your mouth around the mouthpiece then blow out normally.



Exhale once per each sample collection. As you exhale the bag fills with air. Keep it inflated.

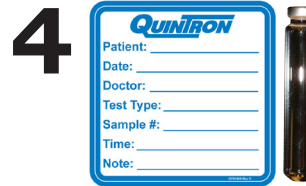
(*There is a small hole in the bag, this is intentional.*)

During your exhalation, insert the test tube into the needle holder completely so the stopper on the tube is punctured.



**Remove the test tube after 1-2 seconds.**

**Keep the bag inflated until after the test tube is removed from the test tube holder.**



Complete the tube label provided.

**Make certain you label the Sample # correctly or your results will be inconclusive.**

**Drink the entire test solution you prepared and then wait 20 minutes.**

Collect one breath sample every 20 minutes until all test tubes are used.

Collect all samples following the Sample Chart and Collection Steps 1-4.

Put collection test tubes in the bubble bag(s). Place the bubble bag(s), any paperwork, and the EasySampler device back in the cardboard container, and return to the laboratory for analysis immediately.

**Return the kit immediately for analysis.**

**Your breath sample is only stable for 14 days after collection.**