TEST

Lactose tolerance tests

Lactose tolerance tests assess how your body digests lactose using breath or blood samples after a lactose drink.

WHAT IT MEASURES
Breath hydrogen or blood glucose rise after lactose

SAMPLE
Breath samples or blood samples

FASTING NEEDED?
Yes, usually overnight following laboratory instructions

HOW LONG IT TAKES
About two to three hours

RESULTS IN
Same day to several days, based on laboratory processing

USED FOR
Supporting diagnosis of lactose malabsorption

MAIN LIMITATION
A positive test may not explain your symptoms

Overview

Lactose tolerance tests help find out whether your small intestine digests lactose normally. Lactose is the natural sugar in milk and many dairy products.

Your small intestine usually makes an enzyme called lactase. This enzyme breaks lactose into sugars that can be absorbed. When lactose is not fully digested, it passes into the large intestine. Bacteria then ferment it, producing gas and drawing water into the bowel.

There are two main tests:

The breath test is used more often. Blood testing is available in some settings but can be affected by how your body handles glucose.

A test can show lactose malabsorption , meaning lactose was not fully absorbed. Lactose intolerance means that lactose causes symptoms. These are related, but they are not identical. Some people have an abnormal test without troublesome symptoms, while others report symptoms that have another cause.

- Hydrogen breath test: measures hydrogen, and sometimes methane, in your breath after a lactose drink
- Blood lactose tolerance test: measures how much your blood glucose rises after the drink

Why the test is ordered

The test may be ordered if dairy foods appear to cause bloating, abdominal discomfort, gas or diarrhea. It can help separate lactose malabsorption from other possible explanations for these symptoms.

Testing may also be considered when avoiding lactose has not given a clear answer. Your clinician may want objective evidence before you make a long-term dietary change.

The test does not identify every cause of digestive symptoms. Conditions such as irritable bowel syndrome, coeliac disease, inflammatory bowel disease and small intestinal bacterial overgrowth can cause similar problems.

Who should have the test

Testing may be useful if you repeatedly develop digestive symptoms after consuming lactose and the cause remains uncertain. It is not usually a general screening test for people without symptoms.

A clinician may choose a different approach for a young child or someone who cannot safely fast or drink the test solution. Stool acidity testing is sometimes used in infants and young children, although it is less specific.

Tell the testing service beforehand if you are pregnant, have diabetes, recently had bowel surgery or have difficulty fasting. Also mention a known milk allergy. Lactose intolerance is not an allergy, but the ingredients of the test drink should still be checked if you have had an allergic reaction to milk.

How to prepare

Follow the instructions from your testing service because preparation and test drinks differ. Most tests require an overnight fast. Plain water may be allowed, but confirm this in your instructions.

You may be asked to avoid certain high-fibre or slowly digested foods the day before a breath

test. On the morning of the test, you will usually need to avoid food, coffee, tea, chewing gum, smoking and vaping.

Recent antibiotics like amoxicillin or doxycycline can change the bacteria that produce breath gases. Bowel-cleansing products, laxatives, probiotics and medicines that affect movement through the bowel may also matter. The laboratory may ask you to delay testing or pause selected products.

Do not stop a prescribed medicine unless the clinician or testing service tells you to. Bring a list of your medicines and supplements.

Avoid vigorous exercise shortly before and during a breath test. Exercise and changes in breathing can affect the gas concentration in a breath sample.

What happens during the test

For a hydrogen breath test, you first breathe into a collection bag or handheld device. This gives a baseline reading. You then drink a measured lactose solution.

Further breath samples are collected at set intervals, often over two to three hours. The laboratory measures hydrogen and may also measure methane. You may be asked to record symptoms such as bloating, pain, gas or diarrhea during the appointment.

For a blood lactose tolerance test, a blood sample is taken before you drink the lactose solution. Several more samples are then taken over the next few hours. The laboratory checks whether your blood glucose rises as lactose is digested and absorbed.

The drink is usually very sweet. If you do not finish it, vomit, or cannot provide a sample at the correct time, tell the staff because this can affect interpretation.

Understanding your results

On a breath test, a clear rise in hydrogen after the lactose drink supports lactose malabsorption. Some laboratories also consider methane because certain gut bacteria produce methane instead of hydrogen.

The timing of the rise matters. An unusually early increase may suggest that bacteria encountered the lactose sooner than expected, which can happen with rapid bowel movement or excess bacteria in the small intestine.

For a blood test, a smaller-than-expected rise in glucose may support lactose malabsorption. Each laboratory applies its own procedure and decision limits.

Results should be interpreted alongside your symptoms. An abnormal number without symptoms does not automatically mean you need to avoid all lactose. A normal result does not prove that dairy foods cannot contribute to symptoms through another mechanism.

Ranges and interpretation vary by laboratory, test method, age, sex, pregnancy status, medicines and clinical context.

What affects the results

Breath testing depends on your gut bacteria, bowel movement and preparation. The laboratory equipment can work correctly while the result is still misleading.

Important influences include:

For the blood test, diabetes and other conditions affecting glucose control can make the glucose rise harder to interpret. Delayed stomach emptying, rapid bowel transit, vomiting or mistimed blood samples may also change the result.

Temporary intestinal injury from a recent infection can reduce lactase activity. In that situation, the test may correctly show malabsorption even if the problem later improves.

- Recent antibiotics: may reduce gas-producing bacteria and hide malabsorption
- Poor fasting or certain foods: may cause a high starting hydrogen level
- Bowel preparation or laxatives: can alter bacteria and bowel transit
- Smoking, vaping or vigorous exercise: can change breath gas measurements
- Methane-producing gut bacteria: may cause little hydrogen despite malabsorption
- Small intestinal bacterial overgrowth: can cause an early rise that resembles lactose malabsorption
- Rapid or slow bowel transit: changes when lactose reaches bacteria

Accuracy and limitations

No lactose tolerance test is correct in every person. There is no single reliable figure for how often testing misses lactose malabsorption or gives an abnormal result when absorption is normal. Accuracy changes with the dose, sampling schedule, gases measured, preparation and the people being tested.

A breath test can miss malabsorption if your gut bacteria produce little hydrogen and methane is not measured. It can appear positive because of poor preparation, rapid bowel transit or

bacterial overgrowth rather than low lactase activity.

The blood test can miss or overstate the problem when glucose regulation or stomach emptying is unusual. For this reason, it is generally less direct than measuring gases produced from undigested lactose.

A supervised lactose elimination followed by reintroduction may sometimes answer the practical question of whether lactose triggers your symptoms. Genetic testing can identify common inherited patterns linked to reduced lactase production, but it does not show whether lactose currently causes symptoms and may be less informative for some ancestry groups.

Direct measurement of lactase from a small-intestinal biopsy is possible, but it is invasive and samples only a small area. It is generally reserved for situations where an endoscopy is being done for another reason.

Risks and complications

A breath test does not involve needles, but the lactose drink may cause temporary bloating, cramps, gas, nausea or diarrhea. These symptoms usually settle after the test.

Blood testing can cause brief pain, bruising or light-headedness. The repeated blood draws may be uncomfortable.

Severe reactions are not expected from lactose intolerance. Seek urgent help if you develop breathing difficulty, swelling, collapse or another sign of a serious allergic reaction after any test drink.

What happens next

Your clinician will consider the result together with your symptoms and medical history. If lactose malabsorption is supported, the next step may be to work out how much lactose you can tolerate rather than automatically removing all dairy products.

If the result is normal or does not explain your symptoms, routine follow-up may look for another cause. Further testing is based on your symptoms rather than the lactose result alone.

Arrange routine medical review if symptoms continue, restrict what you can eat, or are associated with ongoing weight loss. Seek prompt medical care for blood in the stool, severe or worsening abdominal pain, persistent vomiting, fainting, or signs of significant dehydration.

Common questions

Can I drink coffee before the test?

Usually not. Coffee may affect bowel activity, and milk or sweeteners break the fast. Follow the laboratory's instructions about plain water.

Does the time of day matter?

Most tests are scheduled in the morning because an overnight fast is required. The exact time matters less than completing the preparation correctly.

Can I exercise beforehand?

Avoid vigorous exercise shortly before and during a breath test. It can change your breathing pattern and the concentration of gases in the sample.

Can I take my usual medicines?

Some medicines affect gut bacteria or bowel movement, while others should not be interrupted. Ask the testing service in advance and do not stop prescribed treatment on your own.

Will the test make me feel unwell?

It may reproduce your usual symptoms because you drink lactose during the test. Bring any items the service recommends and allow time for symptoms to settle before travelling.

Can I use a home breath test?

Home kits are available, but collection timing, storage and preparation affect the result. Check that the kit uses an accredited laboratory and arrange clinical interpretation rather than relying on the number alone.

Sources

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