

Study Links Chronic Xanthan Gum Consumption to Colon Inflammation

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STORY AT-A-GLANCE

- › Long-term xanthan gum consumption triggered measurable inflammation in the colon of otherwise healthy rats, even though their weight, blood sugar and cholesterol remained normal, suggesting digestive changes can develop before routine health markers reveal a problem
- › Researchers found that xanthan gum altered proteins that help maintain the gut's protective barrier, making the intestinal lining more permeable and allowing inflammation to become established
- › The study also found subtle shifts in specific groups of gut bacteria that occurred alongside inflammation, indicating that repeated xanthan gum exposure affected both the gut microbiome and the intestinal environment
- › Xanthan gum is widely used in processed foods, including gluten-free products, salad dressings, sauces, protein powders, frozen meals, and many packaged snacks, making it easy to consume multiple times a day without realizing it
- › Reading ingredient labels, choosing fresh whole foods over heavily processed products and preparing more meals at home are practical ways to reduce your xanthan gum exposure and support a healthier digestive tract

For decades, xanthan gum has slipped into the food supply with almost no scrutiny. Manufacturers add it to gluten-free breads, salad dressings, sauces, ice cream, protein shakes, and countless packaged foods because it thickens, stabilizes, and improves texture without changing flavor. Many people don't think twice when they see it on an ingredient label.

Yet that confidence rests on surprisingly little long-term safety data, and most of what does exist focuses on surface-level markers — weight, blood sugar, cholesterol — that can look perfectly normal while something deeper goes wrong.

Xanthan appears across so many product categories that anyone eating a modern processed diet likely consumes it multiple times a day without realizing it. People with swallowing disorders may take in even more, since xanthan gum-based thickeners are standard in clinical nutrition. The question scientists have largely failed to ask is what happens inside the digestive tract when that kind of exposure continues week after week.

An animal study finally looked in the right place, and what the researchers found beneath the surface contradicted everything the conventional safety profile would predict. Next, I'll break down exactly what they discovered and why those changes deserve your attention.

Xanthan Gum Triggered Hidden Inflammation in the Colon

The study, published in PLOS One, investigated what happened when adult Wistar rats consumed **xanthan gum** every day for 10 weeks.¹ The researchers examined the colon itself, measuring inflammatory chemicals, immune cell activity, gut barrier proteins, and changes in the gut microbiome.

They also tested three different xanthan gum doses designed to reflect different patterns of human consumption, from people who regularly eat processed foods to those who rely on xanthan gum-based thickeners because of swallowing disorders. The researchers wanted to determine whether continuous exposure altered the intestinal environment. That's important because changes inside your digestive tract often develop long before routine blood work reveals a problem.

- **The colon became inflamed even though the animals looked healthy on the outside** — After 10 weeks, the rats showed no significant differences in body weight, food intake, body fat, blood glucose, triglycerides, cholesterol, or HDL cholesterol compared to animals that didn't receive xanthan gum.

If a doctor looked only at those numbers, everything would appear normal. Yet microscopic examination of the colon told a very different story. The researchers found that xanthan gum promoted "an inflammatory state" across all doses and concluded that "dietary xanthan gum induced moderate-grade inflammation and modified the colon gut barrier."

- **Immune cells accumulated inside the intestinal wall as xanthan gum intake continued —**

When researchers examined colon tissue under the microscope, they found inflammatory cells had infiltrated the intestinal wall, especially in the groups receiving the medium and highest xanthan gum doses. Most of these cells were lymphocytes, a type of white blood cell involved in long-lasting immune responses rather than short-lived reactions.

The researchers also assigned inflammation scores based on the severity of tissue changes. Compared to the control animals, both the medium- and highest-dose groups had significantly higher scores, confirming that the inflammatory response was measurable rather than simply a microscopic observation.

- **Proteins that help control what passes through your intestinal lining shifted in the wrong direction —** Researchers found greater amounts of Claudin-2 in the xanthan gum groups. Claudin-2 is a protein that acts like adjustable caulking between intestinal cells; it controls how tightly those cells seal together. When Claudin-2 levels rise above normal, the seal loosens, allowing substances to slip through the intestinal lining that would normally stay inside the digestive tract.

The researchers also observed higher levels of inflammatory signaling molecules known to increase Claudin-2 and weaken the gut barrier, creating conditions that reinforce inflammation instead of allowing the tissue to recover.

- **The gut microbiome changed in subtle but meaningful ways —** Xanthan gum didn't significantly alter the dominant bacterial groups known as Firmicutes and Bacteroidetes or the overall diversity of the [microbiome](#).

Even so, the highest-dose group developed significantly higher levels of Elusimicrobiota, a relatively rare group of gut bacteria that scientists are still working to understand, while the medium-dose group showed a trend toward more Patescibacteria, another uncommon group of microbes often found in complex microbial communities.

These shifts matter not because scientists fully understand what these bacteria do, but because they didn't occur in isolation — statistical analysis linked them directly to the inflammatory markers and barrier protein changes happening in the same tissue, suggesting the microbiome was responding to the inflammatory environment xanthan gum created rather than changing randomly.

- **The findings offer a biological explanation for earlier concerns about xanthan gum** — The researchers explained that their results support previous reports linking xanthan gum-containing thickeners with serious intestinal problems such as necrotizing enterocolitis — a life-threatening condition in which intestinal tissue becomes severely inflamed and begins to break down — in premature infants.

Although this study involved adult rats, it identified specific biological changes, including chronic inflammation, altered gut barrier proteins, and microbiome shifts, that help explain why long-term xanthan gum exposure deserves closer attention.

These findings come from an animal study. Additional research is needed to determine whether the same effects occur in humans.

How to Reduce Your Xanthan Gum Exposure at the Source

If your goal is a healthier gut, the smartest place to start is with the foods that introduce the problem in the first place. The research in this article showed changes in the colon after long-term xanthan gum exposure, not because of a nutrient deficiency but because of repeated intake of a common food additive. That means your greatest opportunity is to reduce the amount that enters your diet every day instead of searching for something that simply masks the effects afterward.

1. **Find the hidden sources of xanthan gum before you eat them** — Try a one-week label audit.

Xanthan gum appears in a wide variety of foods, including gluten-free breads, tortillas, wraps, salad dressings, sauces, gravies, soups, protein powders, meal replacement shakes, nondairy products, [ice cream](#), frozen meals, and many packaged snacks.

Make it a habit to read ingredient labels before you buy packaged foods. Every time you spot xanthan gum, choose a different product that doesn't contain it whenever possible. You might be surprised by how often it appears. Once you recognize where it hides, avoiding it becomes much easier and eventually turns into second nature.

A simple rule of thumb: spend most of your shopping time around the perimeter of the grocery store where fresh foods are located, and less time in the center aisles where xanthan gum is most likely to appear.

- 2. Build your meals around fresh whole foods instead of products that rely on stabilizers —** The easiest way to avoid xanthan gum is to eat foods that don't need it in the first place. Fresh fruits, properly prepared vegetables, whole-food carbohydrate sources that fit your digestive tolerance, high-quality animal protein, and simple homemade meals eliminate many **processed food additives**.

I also recommend avoiding the highly processed foods that commonly contain xanthan gum along with other unwanted ingredients. That includes many packaged sauces, gluten-free convenience foods, protein bars, frozen meals, salad dressings, and similar products.

Cooking more of your own meals gives you complete control over every ingredient. If a recipe calls for xanthan gum as a thickener, try whole-food alternatives instead — pureed cooked potato or vegetables, or a simple reduction, can often achieve the texture you need without any additive at all.

- 3. Support your gut instead of overwhelming it with more processed foods —** If your digestion already feels off, don't assume adding more **fiber** or more processed "health foods" solves the problem. Focus first on removing foods that repeatedly irritate your digestive tract, including not only xanthan gum but also seed oils, which are high in **linoleic acid** (LA); they weaken your colon's protective lining and make it harder for beneficial bacteria to thrive.

Begin with simple, easy-to-digest meals that minimize excessive fermentation and reduce the release of endotoxins — toxic compounds produced when certain gut bacteria break down. This gives your intestinal lining a better environment to recover. As your digestion becomes more consistent, gradually increase your carbohydrate intake using foods that your gut handles comfortably.

Start with whole fruit and well-cooked starches such as white rice, which provide glucose to fuel your cells without placing excessive demands on an already stressed digestive system. Next, introduce root vegetables, followed by non-starchy vegetables, then starchy vegetables such as squash and sweet potatoes. Save beans, legumes, and minimally processed whole grains for last, and only if your digestion remains stable. Most adults thrive on about 250 grams of carbohydrates per day.

4. Choose fats that support better metabolic health instead of processed seed oils — Xanthan gum often appears in the same packaged foods that contain seed oils. Those oils add another unnecessary burden to your metabolism. I recommend replacing soybean, corn, sunflower, safflower, cottonseed, grapeseed, and canola oils with more stable fats such as grass fed butter, ghee, or tallow. Avoid nuts and seeds as they're also high in LA.

FAQs About Xanthan Gum and Colon Inflammation

Q: Does this study prove xanthan gum is harmful to people?

A: No. This research was conducted in rats, not humans, so it doesn't prove the same effects occur in people. However, it showed that long-term xanthan gum consumption caused measurable inflammation, changes to proteins that regulate the gut barrier and shifts in the gut microbiome, giving scientists a biological reason to study its long-term effects in humans more closely.

Q: Why didn't routine health measurements reveal a problem?

A: The rats maintained normal body weight, blood sugar, cholesterol, and other metabolic markers throughout the study. The concerning changes only became apparent when researchers examined the colon tissue under a microscope, showing that gut inflammation can develop long before standard health measurements change.

Q: What happened to the intestinal lining after long-term xanthan gum intake?

A: Researchers found increased amounts of proteins associated with a leakier intestinal barrier, along with higher levels of inflammatory signaling molecules. Together, these changes suggest the colon became less effective at keeping unwanted substances inside the digestive tract and more prone to ongoing inflammation.

Q: Where is xanthan gum commonly found in the food supply?

A: Xanthan gum is widely used as a thickener and stabilizer in processed foods. Common sources include gluten-free breads and tortillas, salad dressings, sauces, soups, protein powders, meal replacement shakes, frozen meals, nondairy products, ice cream, and many packaged snack foods. Reading ingredient labels is the easiest way to identify and avoid it.

Q: What's the most effective way to reduce your exposure to xanthan gum?

A: Focus on replacing packaged foods with fresh, whole foods whenever possible. Preparing more meals at home, checking ingredient labels before you buy packaged products and choosing alternatives that don't contain xanthan gum are practical ways to reduce your daily exposure while also cutting back on many other processed food additives.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified healthcare provider before making changes to your health regimen.

Sources and References

- ¹ [PLOS One 2026 Apr 15;21\(4\):e0347232](#)