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Akkermansia Claims to Support Gut Health — Here's What the Science Says

Analysis by Dr. Joseph Mercola | June 04, 2026

STORY AT-A-GLANCE

- Akkermansia muciniphila is a gut microbe that thrives in your intestinal mucus layer. It's linked to improved metabolic health, but its levels decrease with age and poor diet
- Studies suggest Akkermansia may support a healthy weight by influencing fat mass, insulin sensitivity, and inflammatory markers, as shown in animal models. It also has roles in glucose and lipid metabolism
- Akkermansia may stimulate natural GLP-1 production. It may also help support blood sugar regulation and cardiovascular health markers
- Research has also linked Akkermansia levels to intestinal barrier integrity, immune regulation, and the gut microbial ecosystem, and has been observed as a marker associated with favorable metabolic profiles
- To boost Akkermansia levels, consume polyphenol-rich foods and high-inulin vegetables. Supplements are available but require careful dosing and timing for effectiveness

Akkermansia muciniphila, a gut microbe you may have never heard of, is gaining attention in the world of metabolic health. This oval-shaped, anaerobic bacterium was first isolated in 2004 and has since become a subject of intense research. Akkermansia is unique in its ability to thrive in your intestinal mucus layer, using mucin as its primary food source. This gives it a survival advantage that isn't strictly dependent on your diet.

Akkermansia is a significant player in your intestinal ecosystem, but as you age, the abundance of Akkermansia in your gut changes. It's present in breast milk and increases rapidly in infants, reaching adult levels by age 2.[1]

Your diet also impacts Akkermansia levels, with high-sugar or high-fat diets reducing its abundance, while calorie restriction and certain prebiotics can increase it.[2] Many mainstream media outlets have picked up on Akkermansia's health potential, including its reputation for being a "game-changer for weight loss."[3,4] Research suggests this attention is well-founded, with a growing body of preclinical evidence now informing early human studies.

Akkermansia and Body Composition Research

Obesity has become a major health concern, and Akkermansia is one area researchers are studying as part of metabolic health approaches. Studies have consistently shown that obese individuals tend to have lower levels of Akkermansia in their gut compared to lean individuals.[5] This observation has led researchers to investigate whether supplementing with Akkermansia could help with obesity.

- **Animal studies have shown promising results —** When obese mice were given live Akkermansia, they showed reduced gain in fat mass and improved insulin sensitivity markers.[6] This suggests Akkermansia may have a role in glucose and lipid metabolism, though most direct evidence remains preclinical.

- **Akkermansia has been linked to lower inflammation markers —** In studies, higher Akkermansia levels correlated with lower levels of inflammatory markers like TNF-α and interleukin-6,[7] which are often elevated in obese individuals.

The bacterium also produces short-chain fatty acids (SCFAs) like acetate and propionate, which may contribute to glucose and lipid metabolism as well as weight regulation.[8]

Akkermansia and Natural GLP-1 Production

Injectable glucagon-like peptide 1 (GLP-1) agonists like **Ozempic** (semaglutide) have become widely used for weight loss. However, there are side effects reported in connection with these drugs, including disproportionate loss of muscle mass (associated with frailty), thyroid C-cell tumors in animal models, kidney dysfunction, pancreatitis, and intestinal obstruction.[9,10]

One disproportionality analysis published in JAMA Network Open also found that suicidal ideation was reported 45% more frequently among semaglutide users than expected relative to other drugs in the World Health Organization (WHO) adverse-event database.[11] However, regulatory reviews have not established a causal association.[12]

There is growing interest in whether the body's own GLP-1 production can also be supported through the gut microbiome. A study published in Nature Microbiology demonstrated that Akkermansia may not only help enhance thermogenesis but also induce GLP-1 secretion in mice fed a high-fat diet, suggesting a mechanistic overlap between GLP-1 agonist activity and the effects Akkermansia may have on natural GLP-1 secretion.[13]

In my interview with Dr. Colleen Cutcliffe, a molecular biology scientist and co-founder/CSO of Pendulum Therapeutics (a company that manufactures Akkermansia probiotic products), she discussed how naturally elevating GLP-1 levels by increasing the presence of Akkermansia may support metabolic health:

> *"When it was observed that people with Type 2 diabetes or prediabetes were low in Akkermansia, it was believed that it was because of this mucin deficiency. But as people started to study Akkermansia more, and the microbiome in general, what's become clear is that it's a lot more direct than just the mucin layer.*
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> *What happens in your body naturally, if you've got all the right microbes, is that you eat a meal, your microbiome metabolizes that food and generates postbiotics [excretions from beneficial bacteria] like butyrate [and] a protein called P9. Some of these postbiotics then signal your body to produce GLP-1.*

All that signaling is happening from the microbiome directly to the L cells. And so you eat a meal, your microbiome digests them, these postbiotics get created and tell your L cells, 'Hey, go produce GLP-1,' and then you get a spike in GLP-1 in your body.

GLP-1 stimulates your body too. It says, 'We've got to metabolize the sugar in the bloodstream, release insulin.' It also signals to your brain, 'We just ate, we're full, we don't need to eat again.' After a period of time, GLP-1 goes down — until the next time you eat a meal. Then it spikes again.

So that's the natural way of things. There are only two strains that have been published, to date, that have been shown to be able to stimulate L cells to produce GLP-1, and one of them is Akkermansia. It actually secretes three different [postbiotics] that stimulate L cells to produce GLP-1.

So, what's been found is that if you are low or missing Akkermansia, your body is not naturally producing as much GLP-1 as it's supposed to be. By giving people back Akkermansia, you can now have these physiological benefits of reducing A1C and lowering blood glucose spikes.

To be clear, the natural GLP-1 you produce is different from the drug. The drug is a mimic. It's an analog. It looks like GLP-1. It gets injected into the bloodstream directly, which means that rather than the natural spike after you eat [followed by a decline], the [drug] is keeping those levels really high all the time.

So, this signaling of 'we got to metabolize sugar in the blood and we're full, we just ate' is going on constantly. That's why people experience these incredible, amazing overnight effects because that's how those drugs are working. But if you actually have the right microbes, you can generate your body's natural GLP-1 and get back into this natural cycle."

Akkermansia in Metabolic and Cardiovascular Research

Akkermansia has also been studied in the context of other metabolic conditions, particularly Type 2 diabetes and cardiovascular disease (CVD). Studies have found that individuals with Type 2 diabetes often have lower levels of Akkermansia in their gut. When diabetic mice were supplemented with Akkermansia, they showed improvements in glucose tolerance markers and intestinal barrier function.[14]

- **Akkermansia's effects on gut and cardiovascular markers —** By supporting intestinal barrier integrity, Akkermansia may help regulate chronic low-grade inflammation markers in insulin resistance. In preclinical animal research, Akkermansia supplementation was found to correlate with improvements in Western diet-induced atherosclerosis markers.[15]

- **It achieves this by inhibiting the formation of trimethylamine N-oxide (TMAO) —** This is a compound linked to increased cardiovascular risk. These findings suggest that Akkermansia may play a role in supporting healthy blood-sugar and cardiovascular markers, though most direct evidence remains preclinical.[16]

Akkermansia — Your Gut's Tiny Guardian

Sometimes called the "sentinel of the gut," Akkermansia may help support gut barrier integrity, regulate immune reactions, lower inflammatory response markers, and support a healthy balance of beneficial bacteria.[17] It may also serve as a marker for a favorable metabolic profile.[18]

- **Akkermansia plays a role in strengthening your intestinal barrier —** This is your body's first line of defense against harmful substances. Akkermansia may help increase the number of mucus-producing goblet cells in your colon and regulate mucus layer thickness by both metabolizing and stimulating the production of new mucin. This process not only provides nutrients for the bacterium but also helps maintain the protective shield for your intestinal epithelial cells.[19]

- **It may also affect gene expression —** Akkermansia has been shown to influence the expression of genes involved in immune regulation and metabolism,[20] and may accelerate the development of intestinal epithelial cells by stimulating the proliferation of intestinal stem cells.

  It may also help increase the expression of the Wnt signaling pathway and promote the production of SCFAs, which interact with specific receptors to maintain the proliferation of intestinal stem cells and promote the differentiation of specialized cells.[21]

- **Furthermore, Akkermansia may upregulate the expression of tight junction proteins —** These are key regulators of your intestinal epithelial barrier function. These proteins control the passage of molecules through your epithelial layer based on their size and charge, physically impeding the invasion of microorganisms.

  Akkermansia's extracellular vesicles have been shown to reduce intestinal permeability in mice by modulating these tight junctions. By influencing these various components of the intestinal barrier, Akkermansia may help support the gut's defense system.[22]

- **Akkermansia interacts with specific receptors to activate the NF-κB pathway —** It not only regulates your intestinal immunological microenvironment but also helps prevent intestinal inflammation. By modulating these various inflammatory pathways, Akkermansia plays an important role in maintaining the delicate balance of your gut's immune system, with potential implications for inflammatory bowel conditions.[23]

The Role of a Balanced Microbiome in Gut Health

The diverse array of microorganisms inhabiting your gut demonstrates resilience and harmony, with countless microscopic life forms working together to safeguard your health. By nurturing beneficial, oxygen-intolerant bacteria like Akkermansia, you may

help support intestinal barrier health, reduce endotoxin exposure, and cultivate a healthier gut environment.

- **These bacteria metabolize dietary fibers, producing SCFAs, primarily butyrate —** This compound serves as the main fuel for colonic epithelial cells, empowering them to reinforce your intestinal barrier. Additionally, SCFAs stimulate goblet cells to produce mucin, which may help defend epithelial cells against pathogenic oxygen-tolerant bacteria.

- **When the oxygen-intolerant bacterial population diminishes, it can lead to leaky gut syndrome —** In this condition, the large intestine's lining may become compromised, which may allow substances like endotoxins, undigested food particles, and microbes to pass through tight junctions that normally control this passage. Research has associated this with systemic inflammation and various chronic conditions.

- **Oxygen-intolerant bacteria play a vital role in gut health —** These bacteria thrive in an oxygen-free environment, which requires adequate cellular energy to maintain. However, modern factors like seed oil consumption and toxin exposure may compromise mitochondrial energy production, limiting your ability to maintain a gut environment with little to no oxygen present.

- **Excessive seed oil consumption shifts the bacterial population from oxygen-intolerant to oxygen-tolerant species —** This shift is significant because oxygen-tolerant bacteria produce more virulent endotoxins than their oxygen-intolerant counterparts. This could mean individuals with an abundance of oxygen-tolerant bacteria in their gut may experience more severe reactions to plant carbohydrates due to increased endotoxin exposure.

Grasping the interconnected relationship among cellular energy generation, oxygen distribution in your gut, and microbial diversity is essential for peak wellness, both physical and mental. Enhancing mitochondrial function and preserving a well-balanced

intestinal ecosystem can foster the growth of beneficial oxygen-intolerant bacteria while reducing the negative effects of harmful endotoxins.

Top Akkermansia Health Benefits

Akkermansia can be a notably beneficial member of the gut microbiome, with reported relative abundances of approximately 1–4% in healthy adult populations.[24] However, DNA analyses suggest that about one-third of people have few to no Akkermansia, which may be related to factors like poor cellular energy metabolism and resulting low oxygen levels in the gut. To summarize, here are some of the ways Akkermansia may benefit your health:

- **Diabetes risk —** DNA sequencing has observed that individuals with prediabetes and Type 2 diabetes often have lower levels of Akkermansia or are missing this strain. (This is an observational association, not an established treatment effect.)

- **Gut mucin layer —** Researchers have found through both human and animal studies that Akkermansia is the only strain known to date that regulates the mucin layer. Cutcliffe describes it as "the 'glue' that keeps your gut lining strong." She further explains:

> *"You have these epithelial cells and the junctions between them are held together by glue, which is called mucin. When the mucin layer gets too thin, you lose those tight junctions, and that's where you can start to get things moving across that boundary that are not supposed to move across it.*
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> *So, it's important to have a strong gut lining and Akkermansia is the only strain we know of that is there at the mucin layer, both consuming and regenerating it, and really regulating that layer. That's why it's so pivotal to all these different disease states, because it's basically in charge of your gut lining."*

- **Autoimmune-related research —** Studies suggest that leaky gut may be related to Akkermansia loss. Some researchers consider this a contributing factor in autoimmune-related conditions, though it remains an area of active investigation.

- **Food sensitivities, allergies, and inflammation —** These conditions are associated with mucin layer dysfunction and tight junction permeability. Research suggests that supporting Akkermansia levels may help restore mucin layer integrity and tight junction function.

Why Mitochondrial Function Is Key to Successful Akkermansia Supplementation

When your cellular energy decreases, your body struggles to effectively eliminate oxygen from your colon. This has serious consequences for the normal inhabitants of your colon, which can be killed when oxygen levels rise. This is why Akkermansia supplementation alone is not a complete solution.

- **It is important to address mitochondrial-toxin exposure before supplementing —** Reduced mitochondrial function may need to be addressed so the colon can maintain its oxygen-free environment. Without this preparation, Akkermansia supplements may have limited benefit, as newly introduced Akkermansia bacteria may not survive in an oxygen-rich colon environment.

- **This is one of the primary reasons why it's important to eliminate seed oils from your diet —** Aim for at least six months of seed oil-free eating before beginning the two-phase live-Akkermansia supplementation I will outline in the next section. This preparatory period helps support mitochondrial function and create a more hospitable colon environment.

By taking these steps, you can maximize the potential benefits of Akkermansia supplementation and support overall gut health. Remember, addressing the root cause — mitochondrial function and colon oxygenation — is essential for the success of any gut health intervention.

Two-Phase Akkermansia Supplementation

Rather than jumping straight to live bacteria, I recommend a two-phase approach to Akkermansia supplementation:

1. **Phase 1: Begin with a pasteurized Akkermansia postbiotic —** Pasteurized Akkermansia contains the protein Amuc_1100, which has been shown to help support gut barrier integrity and reduce inflammation markers. Look for postbiotic formulas with enteric coating or microencapsulation so they survive stomach acid and reach the colon intact. Without that protection, very little will survive the trip. Megadosing to compensate is expensive and inefficient, so prioritize coated formats.

2. **Phase 2: Introduce live Akkermansia only after gut tolerance is established —** Specifically, wait until bloating remains minimal or absent, stool form has been consistent for at least seven days, and fiber tolerance has expanded without symptom return.

   In Phase 2, pair the live probiotic with gentle prebiotics like small amounts of resistant starch to support butyrate-producing strains and a healthy oxygen-sensitive microbial environment. For live-Akkermansia formulations, look for delayed-release technology and take on an empty stomach to support survival through the upper digestive tract.

Probiotic Potency Explained — CFU, AFU, and TFU

When evaluating the potency of probiotics, two units of measurement often come into discussion: Colony Forming Units (CFU) and Active Fluorescent Units (AFU). Understanding the distinction between these units is crucial for both consumers and healthcare professionals to assess the effectiveness and quality of probiotic supplements accurately.

- **Colony Forming Units (CFU) —** This is the most widely recognized and utilized metric for quantifying the number of viable bacteria or fungal cells in a probiotic product. One CFU represents a single microorganism capable of dividing and forming a colony under specific laboratory conditions. This measure is relevant because the effects of probiotics tend to correlate with the number of live microorganisms that reach the gut.

  Probiotic manufacturers typically list CFU counts on product labels, indicating the number of live organisms per serving. Higher CFU counts are often marketed as more potent, though the optimal CFU dosage can vary depending on the specific strains and the health outcomes targeted.

- **Active Fluorescent Units (AFU) —** This unit is a less conventional and not widely standardized measure in the context of probiotics. While CFU shows the number of bacteria that are alive, AFU refers to the total number of bacteria present, both dead and alive. It is primarily a unit used to measure enzymatic activity.

  For instance, AFU could be used to evaluate the activity levels of specific enzymes produced by probiotics, which contribute to their health benefits, such as breaking down lactose or producing vitamins. In some specialized applications, AFU is also used to assess the metabolic activity or functional potency of probiotic strains beyond mere viability.

  However, because AFU is not a standardized metric in the probiotic industry, its use can lead to confusion and inconsistency in product labeling and efficacy claims.

- **Total Fluorescent Units (TFU) —** This unit measures the total bacterial mass, including both live and dead cells, through fluorescent labeling and is typically used only for pasteurized products.

The primary difference between CFU, AFU, and TFU lies in what they measure: CFU quantifies the number of live microorganisms; AFU assesses the functional activity of those microorganisms; and TFU measures the total bacterial mass.

While CFU provides a clear indicator of the potential for colonization and survival of probiotics in the gut, AFU could offer additional insights into the functional capabilities of the probiotic strains.

However, due to the lack of standardization and widespread recognition of AFU in the probiotic market, CFU remains the gold standard for assessing probiotic potency. Consumers are generally advised to focus on CFU counts and the specific strains included in a probiotic supplement to ensure they are selecting a product with proven efficacy for their health needs.

Akkermansia Clinical Trials

Clinical trials published in 2024 investigating Akkermansia have yielded promising results,[25] highlighting its potential across a range of health conditions, including infectious disease,[26] immune-related disease,[27] liver fibrosis,[28] stress management,[29] intestinal-related diseases,[30] metabolic health,[31] and brain function.[32]

- **Therapeutic doses vary —** These studies, which include both animal and human trials, have primarily used therapeutic doses ranging from 100 million to 10 billion CFU per day. The dosage selected often corresponds to the specific health condition being targeted, ensuring optimal therapeutic effects.

- **High doses are used for metabolic disorders —** For metabolic conditions such as obesity, diabetes, and metabolic syndrome, study doses of 10 billion CFU per day have been commonly administered. This higher dose aims to influence gut microbiota composition and metabolic function markers, and has been associated with improvements in insulin sensitivity, glucose metabolism, and other metabolic markers in studies.

- **Lower doses may be effective for gut-specific and liver-related conditions —** Conversely, lower doses of 1 billion CFU per day have shown promise for gut-specific conditions like leaky gut syndrome, as well as liver health, by promoting intestinal and immune homeostasis.[33]

At these levels, Akkermansia's anti-inflammatory and gut barrier mechanisms, detailed in earlier sections, may be sufficient without the need for higher bacterial concentrations.

Note: *These findings are from a mix of laboratory, animal, and human clinical trials. Results may not directly apply to all individuals.*

Frequently Asked Questions About Akkermansia

Q: Does Akkermansia help with weight loss?

A: Research suggests Akkermansia may play a role in weight regulation by influencing metabolism, appetite signaling, and gut health. Higher levels have been associated with lower obesity rates in observational studies.

Q: Is Akkermansia safe?

A: Akkermansia is naturally present in a healthy microbiome. Available studies have not reported serious side effects from Akkermansia supplementation, though more long-term data are needed. As with any supplement, consult your health care provider before starting.[34]

Q: Does Akkermansia cause diarrhea?

A: Studies have not linked Akkermansia to diarrhea. On the contrary, one study showed that its presence in the gut helped reduce the occurrence of diarrhea in children.[35] However, keep in mind that sudden increases in any beneficial bacteria, including Akkermansia, may cause temporary digestive discomfort, so it's ideal to introduce Akkermansia gradually, whether through diet or supplements.

Q: What causes low Akkermansia levels?

A: Low levels of Akkermansia can be caused by a diet low in polyphenols and soluble fiber, but high in processed foods, added sugar, and harmful fats like linoleic acid. Aging, antibiotic use, chronic stress, sedentary lifestyle,[36] and metabolic disorders can also impact the gut microbiota composition,[37] including Akkermansia levels.

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

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