Prediabetes Weekly Newsletter

Why Supplements Rarely Fix a Systems Problem

Understanding the glucose regulation hierarchy - and where real leverage lives.

Hi Reader,

In Monday's newsletter, we looked at moringa - where the evidence is promising, where it's thin, and why it's best seen as a supporting actor rather than a cure.

Today, I want to zoom out and look at supplements more broadly.

Because the key question isn't "Does berberine work?" or "Is cinnamon legit?"

It's this:

Why do so many supplements produce modest lab changes in studies, yet feel underwhelming in real-life prediabetes?

The answer, again, is systems.

Prediabetes is a systems issue, not a single-nutrient gap

Prediabetes is driven by chronic insulin resistance, impaired beta-cell function, excess liver glucose output, low-grade inflammation, and often sleep, stress, and activity patterns that push glucose regulation out of balance.

At any moment, your blood sugar reflects a web of inputs:

- Liver glucose output

- Muscle glucose uptake
- Insulin sensitivity
- Stress hormones
- Sleep quality
- Meal timing
- Body composition
- Physical activity

Most supplements act on one small part of that web.
They rarely create system-wide change on their own.

That's why even good science can translate into small, subtle changes rather than dramatic reversals.

What the evidence actually says about common supplements

Here's a quick, right-sized look at some of the most popular tools people reach for in prediabetes.

1️⃣ Berberine

- Proposed action: Improves insulin sensitivity, reduces liver glucose output.
- Evidence: RCTs in type 2 diabetes show modest reductions in fasting glucose and HbA1c; data in prediabetes are smaller but broadly similar in direction.
- Reality: One of the better-studied "natural" options, but still a modest mover, not a stand-alone fix.
- Caution: GI upset is common; can interact with other medications via liver enzyme pathways.

2️⃣ Cinnamon (Cassia or Ceylon)

- Proposed action: May improve insulin signaling and slow gastric emptying.
- Evidence: Meta-analyses report small fasting glucose reductions in some trials; others show no significant effect.
- Reality: Effect sizes are usually modest and may not feel dramatic day-to-day.
- Caution: Cassia cinnamon in high doses contains coumarin, which can stress the liver over time.

3️⃣ Alpha-Lipoic Acid (ALA)

- Proposed action: Antioxidant that may improve insulin-mediated glucose uptake.
- Evidence: More consistent benefits in diabetic neuropathy; glucose effects are mixed across trials.

- Reality: Best thought of as oxidative-stress support, not a primary glucose-lowering tool.
- Caution: Can lower blood sugar, especially when combined with insulin or sulfonylureas.

4️⃣ Magnesium

- Proposed action: Supports insulin receptor function and glucose transport.
- Evidence: Supplementation improves insulin sensitivity and fasting glucose primarily in people who are deficient.
- Reality: High-yield if your magnesium is low; low-yield if your levels are already adequate.
- Caution: Too much can cause diarrhea and, in kidney disease, elevated magnesium levels.

5️⃣ Vitamin D

- Proposed action: Modulates insulin secretion, immunity, and inflammation.
- Evidence: Large trials show mixed results overall; clearer benefits in those who start out deficient.
- Reality: Correcting deficiency is important but will not by itself normalize glucose.
- Caution: Test first; long-term high-dose use without monitoring can be harmful.

6️⃣ Chromium (usually chromium picolinate)

- Proposed action: Enhances insulin action.
- Evidence: Some studies show small improvements in glucose and insulin; others find minimal or no effect.
- Reality: Modest and inconsistent; not a cornerstone of management.
- Caution: High-dose, long-term safety data are limited.

7️⃣ Apple Cider Vinegar

- Proposed action: Slows gastric emptying and reduces post-meal glucose spikes.
- Evidence: Small short-term studies show modest reductions in post-prandial glucose and insulin when taken with or before high-carb meals.
- Reality: A useful meal-level tool, not a system-level fix.
- Caution: Can aggravate reflux; may damage tooth enamel if undiluted; potential interactions with some medications.

8️⃣ Psyllium / Soluble Fiber

- Proposed action: Slows carbohydrate absorption and blunts post-meal spikes.
- Evidence: Trials in type 2 diabetes show improvements in fasting and post-prandial glucose and modest HbA1c reductions when used regularly before meals.
- Reality: Often more effective—and more underused—than many “blood sugar herbs.”

- Caution: Increase gradually with plenty of water to avoid bloating or constipation.

9️⃣ Omega-3 Fatty Acids

- Proposed action: Anti-inflammatory; strongly lowers triglycerides.
- Evidence: Robust for triglyceride and cardiovascular risk markers; weak and inconsistent for lowering glucose directly.
- Reality: Cardiometabolic support tool rather than a glucose-lowering strategy.

🔟 Probiotics / “Gut Health” Formulas

- Proposed action: Microbiome modulation affecting metabolic signaling.
- Evidence: Small, strain-specific improvements in fasting glucose and insulin in some studies; overall effects are subtle.
- Reality: Gentle nudge at best; not a primary lever.

The pattern: modest effects, context-dependent gains

Across these different products, a clear pattern emerges:

- Most supplements produce modest changes in glucose and HbA1c compared with lifestyle interventions.
- Benefits are greatest when you’re deficient (magnesium, vitamin D) or have more pronounced dysregulation at baseline.
- In research, supplements almost always sit on top of diet, movement, and/or medication—not instead of them.

Supplements tend to amplify a system that’s already being supported.
They rarely rescue a system that’s chronically strained.

Where supplements actually fit in your plan

If we revisit the “hierarchy of leverage” from earlier this week, the evidence strongly supports this order:

1. Sleep quality and duration
2. Muscle activity and resistance training
3. Meal timing, composition, and consistency
4. Stress load and nervous system regulation
5. Supplements

Supplements live at Layer 5.

That doesn’t make them pointless. It means:

- Their impact is conditional on the layers beneath.
- They work best when sleep, movement, timing, and stress are at least partly in place.

For example:

- Berberine might gently lower your HbA1c when your routine of walking, resistance work, and consistent meals is already established.
- Psyllium can noticeably flatten post-meal spikes when used alongside balanced plates and portion awareness.
- Correcting low magnesium or vitamin D may unlock better insulin sensitivity—but only if your daily inputs aren't constantly pushing glucose upward.

A simple reflection before adding "one more thing"

Before you buy a new supplement, you might ask:

☐ Am I sleeping close to 7–9 hours most nights?
☐ Am I engaging my muscles (walking, strength work) on most days?
☐ Are my meals reasonably consistent in timing and composition?
☐ Is my stress being actively managed—or just endured?
☐ Have I checked and corrected key deficiencies with my clinician?

If several of these are a "no," your highest return on effort almost certainly lives there, not in another capsule.

The calm takeaway

Most prediabetes supplements are not scams. Many have real—but modest—effects under the right conditions.

But prediabetes is a systems condition.
And systems respond best to structural change.

Use supplements as careful, evidence-informed add-ons to a solid foundation—not as work-arounds for sleep, movement, stress, and food.

Next week, we'll dig into intermittent fasting—where it might help, where it can backfire, and how cortisol and circadian biology shape your response.

Until then,

Focus on leverage.
Small structural shifts still outperform quick fixes.

Warmly,

Jackie

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If you tell me which of these supplements you plan to foreground (e.g., berberine + psyllium + ACV + magnesium), I can trim this down to a very tight 4–6-item reference list for the final PDF.