

Insulin

Biohacker Report

REPORT CATEGORY —



Sample Client

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DISCLAIMER

This report does not diagnose this or any other health conditions. Please talk to a healthcare professional if this condition runs in your family, you think you might have this condition, or you have any concerns about your results.

Personal information

NAME

Sample Client

SEX AT BIRTH

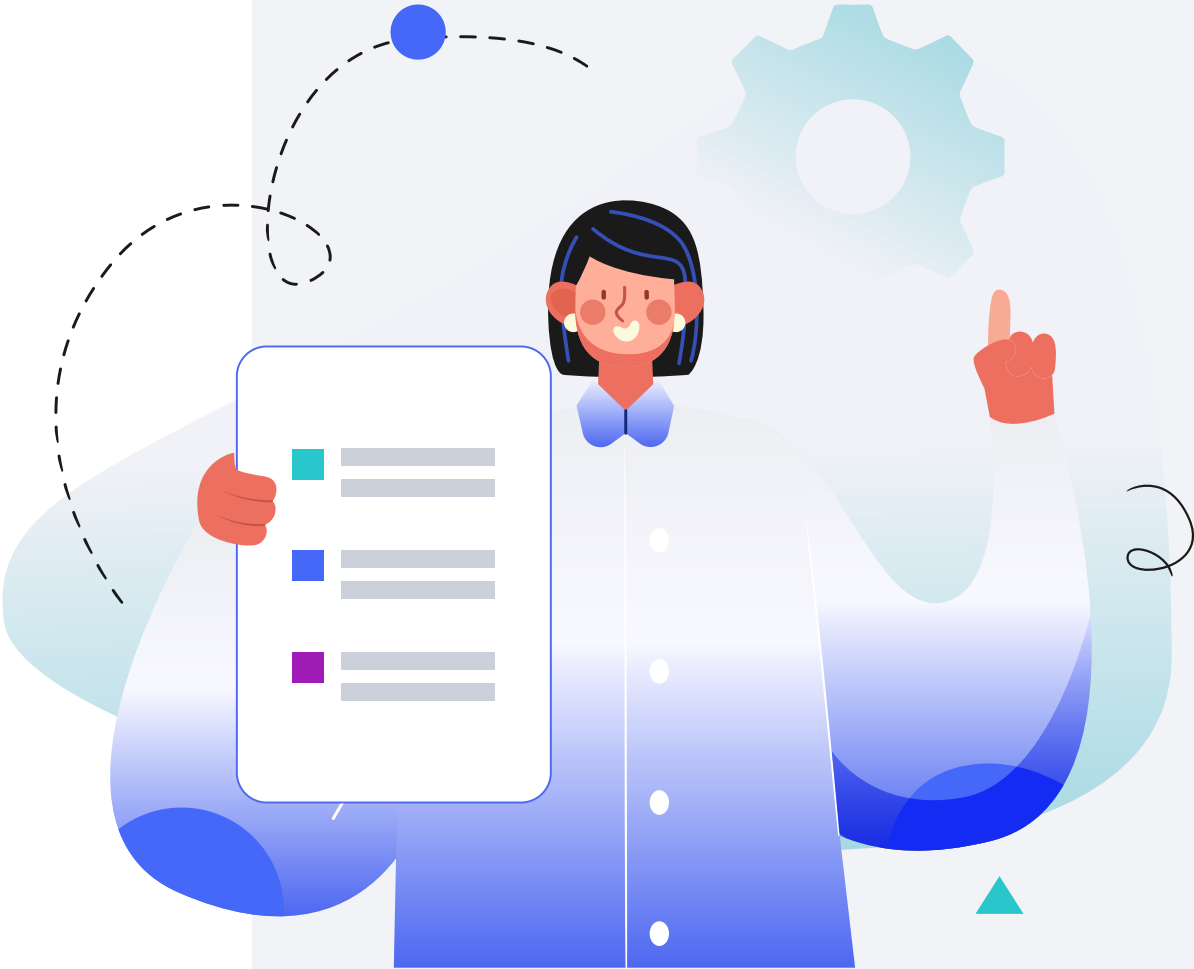
Male

HEIGHT

5ft 5" 165cm

WEIGHT

137lb 62kg



How this works

Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.



Similarly, our Trait Reports look at how your DNA influences your traits.



Your DNA is like an instruction manual — it contains a lot of information.
You can think of it as a blueprint for your body.

Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



We use artificial intelligence and machine learning to analyze all this information.
We then summarize your results as a risk score or display it on a gauge.

In total, we analyze up to 83 million genetic variants.

When we give a risk score, the risk icon tells you if you are at a higher or lower risk compared to other people:



Genotype color info:

AA

You don't have any risk alleles

AA

You have 1 risk allele

AA

You have 2 risk alleles

Your risk is also displayed as a percentile. This will tell you how your risks compare to our sample population. The lower your percentile number, the lower your risk. The "50th percentile" would be an average risk.

Similarly, the gauge tells you your relative risk score compared to our sample population, or it indicates a specific trait or haplotype you are more likely to have based on your genetic variants.

When applicable, we also list top evidence-based recommendations that may help lower your risk. The focus is on recommendations that may be of benefit to you, based on your genetics.

Our recommendations come in four categories: lifestyle, diet, supplements and drugs.
The following icons tell you which category a recommendation falls into:



Our team of scientists also ranks each recommendation.
We rank based on impact and the strength of evidence in the medical literature.

Impact shows how strongly a recommendation will affect your health in a certain area.
Evidence is how much scientific support there is for the recommendation. Rankings are from 1 to 5 (low to high):



Impact

Impact scores range from 1-5. These scores reflect how much of an effect each recommendation can have. An impact score of 5 predicts the biggest effect.

When a recommendation affects something we can measure, we use those measurements to assign the impact score. For example, a recommendation that decreases cholesterol by 20% will have a higher impact score than one that decreases it by 5%.

Some recommendations affect things that we cannot directly measure, like stress or mood. For these, the impact score is based on how well they work relative to other recommendations and standard treatments. The best ones get the highest scores.

If there is a lot of research that shows a recommendation works especially well for your genotype, the impact score gets increased.

Recommendation Evidence

- 5 / 5
- Recommendations that are considered effective and generally recommended by experts and medical bodies.
-
- 4 / 5
- Recommendations that are considered likely effective and that have multiple independent meta-analyses and a great many studies supporting them.
-
- 3 / 5
- Recommendations that are considered possibly effective and have many studies supporting them
-
- 2 / 5
- Recommendations that have insufficient evidence, with two or several clinical trials supporting them, or many studies but with ambiguous results.
-
- 1 / 5
- Recommendations that have insufficient evidence, with a single clinical trial, or with many studies most of which didn't find support for the recommendation.
-
- 0 / 5
- No evidence in humans.

Genotype-specific Evidence

- High-quality
- Direct evidence that a recommendation helps more in people with your gene variant (many clinical trials, a few large clinical trials, or a meta-analysis).
- Medium-quality
- Direct evidence that a recommendation helps more in people with your gene variant (a few clinical trials or one large clinical trial).
- Low-quality
- Direct evidence that a recommendation helps more in people with your gene variant (a single clinical trial or more trials with inconsistent results).
- Indirect
- A recommendation may help more in people with your gene variant because it targets a specific gene or protein affected by your variant (e.g., MTHFR, dopamine).
- In theory
- A recommendation may help more in people with your gene variant because it targets a specific mechanism affected by your variant (e.g., inflammation, oxidative stress).

Some things to keep in mind:

- Genetics doesn’t play a considerable role in a condition or a trait.
- There is not enough research available to estimate a genetic predisposition.
- There are technical limitations to estimating or presenting a genetic predisposition.
- The topic is sensitive, and a genetic predisposition should only be estimated and presented by a healthcare professional.

Introduction

When you eat, your digestive system breaks down carbohydrates into [glucose](#) (sugar). The rise in blood sugar stimulates the pancreas to produce [insulin](#) to signal an abundance of energy in the body [\[R\]](#).

Insulin is a hormone that increases the uptake and storage of sugar in muscles, liver, and fat cells for energy production. By doing this, insulin lowers blood sugar levels. Insulin also helps build proteins and fat [\[R, R, R, R, R\]](#).

Your doctor may order an insulin test to check for insulin resistance or help determine the cause of low blood sugar (hypoglycemia).

High insulin levels may play a role in [\[R, R, R, R, R\]](#):

- Heart disease
- Cancer

Factors Affecting Insulin Levels

Key Takeaways:

- Insulin is the key hormone for blood sugar control.
- High insulin levels may play a role in diabetes, obesity, heart disease, and cancer.
- Low insulin levels may result from type 1 diabetes and pancreas conditions.
- Up to 55% of differences in people's insulin levels may be due to genetics.

Insulin is a hormone that increases the uptake and storage of sugar in muscles, liver, and fat cells for energy production. By doing this, insulin lowers blood sugar levels [\[R, R, R, R, R\]](#).

Between **30%-55%** of differences in people's insulin levels may be due to genetics [\[R, R, R\]](#).

Besides genetics, factors linked to **high insulin levels** include:

- Insulin resistance [\[R\]](#)
- Type 2 Diabetes [\[R\]](#)
- Weight change and obesity [\[R, R, R, R\]](#)
- Insulinomas (usually benign pancreatic tumors) [\[R, R\]](#)

Low insulin levels may result from:

- Type 1 diabetes [\[R, R\]](#)
- Inflammation of the pancreas (pancreatitis) [\[R\]](#)
- Pancreas removal [\[R\]](#)



TYPICAL LEVELS

Predisposed to typical insulin levels based on 462 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
HDAC7	rs111264094	CC
PPARG	rs11712037	CC
PPARG	rs1801282	CC
RFC4	rs17300539	GG
CETP	rs708272	AA
MRPS31	rs10507486	GG
FOXO3	rs2802292	GG
PPARA	rs1800206	CC
IGF1	rs860598	AA
SPX	rs6487237	AA
BCL2	rs12454712	TT
/	rs200678953	TT
BMP2	rs979012	TT
PPARGC1A	rs8192678	TC
TCF7L2	rs7903146	CT
ADRB2	rs1042713	GA
ADRB2	rs1042714	GC
UCP2	rs659366	CT
TMEM60	rs848494	AA
ZC3H11B	rs6674544	AG
ARL15	rs4865796	AG
/	rs77935490	AT
CDHR4	rs9819511	TC
STC1	rs13258890	TC
PDGFC	rs6855363	CT
VEGFA	rs998584	CA
CHRD1	rs12007422	T
PDE3A	rs12369443	AG
EVI5L	rs4804833	AG
GLIS3	rs4339696	GT
HMGA1	rs116141873	GG
INSR	rs1799815	GG

GENE	SNP	GENOTYPE
TSC22D2	rs62271373	TT
FTO	rs9939609	TT
SLC2A2	rs5400	GG
FCER1G	rs5082	AA
DIO2	rs225014	TT
IRS1	rs1801278	CC
TNF	rs1800629	GG
FABP2	rs1799883	CC
IRS1	rs17508368	CC
DPYSL5	rs61007968	GG
BLK	rs12541800	GG
RBL2	rs2024449	CC

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Your Recommendations

Your recommendations are prioritized according to the likelihood of it having an impact for you based on your genetics, along with the amount of scientific evidence supporting the recommendation.

You’ll likely find common healthy recommendations at the top of the list because they are often the most impactful and most researched.

		DOSAGE			DOSAGE
1	Methylfolate	400 mcg	2	Behavioral Sleep Extension	
3	Resveratrol	150 mg	4	Green Coffee Extract	400 mg
5	Beta-Glucans		6	Paleo Diet	
7	Pistachios		8	Kefir	
9	Chickpeas		10	Oats	
11	Barberry	500 mg	12	Yacon	
13	Dill		14	Berberine	1000 mg
15	Kimchi		16	Taurine	500 mg
17	Avoid Perchlorate		18	Tocotrienols	100 mg
19	Spinach		20	Green Peas	
21	Myo-inositol	4 g	22	Lactobacillus Casei	10 billion CFU
23	Rutin		24	Probiotics	30 billion CFU
25	Red Clover	40 mg	26	Strawberries	
27	Glutamine	5 g	28	Akkermansia	
29	Lactobacillus Acidophilus NCFM	10 billion CFU	30	Amaranth	
31	Inositol	2 g	32	Glycine	3 g

33	Jiaogulan (Gynostemma Pentaphyllum)	1350 mg	34	Saccharomyces Boulardii	10 billion CFU
35	Raspberries		36	Aerobic Exercise (Cardio)	1 hour
37	Berries		38	Swimming	30 minutes
39	Restorative Yoga	30 minutes	40	Banaba	32 mg
41	Stair Climbing	10 minutes	42	Buckwheat	
43	Pecans		44	White Kidney Bean Extract	500 mg
45	Hyperbaric Oxygen Therapy	90 minutes	46	Sea Buckthorn	
47	Moringa	400 mg	48	Lettuce	
49	L-Citrulline	3 g	50	Blackberries	
51	Artemisia Extract	200 mg	52	Brown Seaweed And Bladderwrack	500 mg
53	Kiwifruit		54	Black Strap Molasses	
55	Low-Carbohydrate Diet		56	Ascophyllum Nodosum	100 mg
57	Cruciferous Vegetables		58	Gymnema	200 mg
59	Legumes		60	Bladderwrack	300 mg
61	Vegetables		62	Chromium	200 mcg
63	American Ginseng	200 mg	64	Chia Seeds	
65	Apple Cider Vinegar		66	Low-Intensity Exercise	1 hour
67	Cinnamon	1 g	68	Fenugreek	500 mg
69	Bitter Melon Supplement	500 mg	70	Quinoa	
71	DASH Diet		72	Brown rice	

1



Methylfolate

IMPACT

4 / 5

EVIDENCE

3 / 5

How to implement

Take an L-methyl folate supplement (400-800 micrograms daily), ideally with a meal, to improve absorption. This dosage is recommended for adults, including pregnant women, to support overall health, especially to reduce the risk of neural tube defects in developing fetuses. Continue daily use as part of your regular supplement routine.

TYPICAL STARTING DOSE

400 mcg

Description

Folate, a B-vitamin, is crucial for DNA synthesis, cell growth, and the formation of red blood cells. Adequate folate intake supports overall health and reduces the risk of neural tube defects during pregnancy.

[Vitamin B9](#) (*folate*) plays an essential role in [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Making DNA
- Metabolism
- Energy production

SelfDecode recommends L-methylfolate as the preferred folate supplement for those who need one. It is superior to folic acid because it doesn't require activation, but the research is still ongoing [\[R\]](#), [\[R\]](#).

How it helps

Folate, a type of B vitamin, can improve insulin sensitivity and b-cell function, thus promoting proper insulin regulation in the body. This can help prevent the development of insulin resistance, a condition that can lead to type 2 diabetes.

Three meta-analyses (the largest one with 29 trials and 22,250 participants) concluded that supplementation with folate (typically, 0.8-10 mg/day for 4-12 weeks) **lowers fasting glucose (by 0.15 mmol/L or 2.17 mg/dL), HOMA-IR (by 0.40-0.83 units), and fasting insulin (by 1.94 µIU/mL or 1.63-13.47 pmol/L), but not HbA1c** [\[R\]](#), [\[R\]](#), [\[R\]](#).

A meta-analysis of 16 studies and 763 patients with metabolic diseases found that folate supplementation **lowers insulin and HOMA-IR but not fasting glucose or HbA1c** [\[R\]](#).

2



Behavioral Sleep Extension

IMPACT

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EVIDENCE

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How to implement

To implement behavioral sleep extension, aim to increase your total sleep time by going to bed 15 to 30 minutes earlier than your usual bedtime, or by allowing yourself to sleep later in the morning. Gradually increase this time as needed to reach a target of 7 to 9 hours of sleep per night, consistently, including on weekends. Adjust your daily schedule to accommodate this change, making sleep a priority.

Description

Behavioral sleep extension involves adopting healthier sleep habits to extend the duration and improve the quality of sleep. It can lead to improved cognitive function, mood, and overall well-being by addressing sleep deficiency.

How it helps

Extending your sleep can improve your body's insulin sensitivity, reducing risk of diabetes. Better sleep supports a healthy metabolism, allowing your body to process sugars more efficiently.

A systematic review of 7 studies and 138 participants concluded that behavioral sleep extension interventions improve direct and indirect measures of insulin sensitivity. In a non-placebo-controlled trial of 18 overweight or obese men not included in the meta-analyses, a 6-week sleep extension intervention lowered fasting insulin (by 18.10 pmol/L), mean amplitude of glucose excursions (by 0.39 mmol/L), and insulin resistance. Similarly, sleep extension to over 6 h/night for 2 weeks improved insulin resistance, early insulin secretion, and β -cell function in a non-placebo-controlled trial of 21 chronically sleep-deprived participants [\[R\]](#), [\[R\]](#), [\[R\]](#).

3



Resveratrol

IMPACT3 / 5

EVIDENCE3 / 5

How to implement

Take 150-500 mg of resveratrol as a supplement daily, preferably with meals to enhance absorption. This dosage range is based on studies for various health benefits, and it's advised to not exceed 500 mg per day without medical supervision.

TYPICAL STARTING DOSE

150 mg

Description

Resveratrol is a natural compound found in red grapes, red wine, and some berries. It is known for its potential antioxidant properties and its role in promoting heart health.

[Resveratrol](#) is an antioxidant found mainly in [\[R\]](#):

- Berries
- Red grapes
- Red wine
- Peanuts

It’s purported to have anti-inflammatory and antioxidant effects [\[R, R, R\]](#).

How it helps

Meta-analyses reveal that resveratrol supplementation can positively impact glycemic control. It may lower fasting glucose levels (by 4.77 mg/dL), especially in doses of at least 500 mg/day and interventions lasting at least 10 weeks. In individuals with diabetes, it may reduce fasting glucose (by 7.97 mg/dL), insulin, HbA1c, and insulin resistance, with larger doses (at least 1000 mg/day) showing more significant effects. In those with type 2 diabetes already on hypoglycemic therapy, resveratrol may also lower fasting glucose and insulin levels [\[R, R, R, R, R\]](#).

Resveratrol may help by improving insulin sensitivity and reducing insulin resistance.

4



Green Coffee Extract

IMPACT

3 / 5

EVIDENCE

3 / 5

How to implement

Take a 400 mg dose of green coffee extract supplement daily. This can be consumed in the morning or as directed on the supplement’s packaging.

TYPICAL STARTING DOSE
400 mg

Description

Green coffee extract is believed to support weight management due to its high content of chlorogenic acids, which may help regulate blood sugar levels and promote fat metabolism.

Green coffee is made from unroasted coffee beans. It’s rich in an anti-inflammatory and antioxidant compound called [chlorogenic acid](#) [R, R].

Green coffee may help lower [R]:

- Blood pressure
- Weight
- Blood sugar levels

How it helps

Three meta-analyses (the largest one with 15 studies and 637 participants) concluded that green coffee bean extract lowers insulin by 0.63 μU/L. In one of them, green coffee extract only lowered insulin (by 1.942 mg/dL) at doses above 400 mg/day [R, R, R].

Please note: *Green coffee bean extract contains caffeine. Keep this in mind if you're trying to limit your caffeine intake. If you're pregnant, limit caffeine to 200 mg per day* [R].

Please note: *chlorogenic acid from green coffee beans may inhibit the production of the thyroid hormone T4 (thyroxine). Individuals with thyroid disorders, particularly hypothyroidism or low T4 levels, should exercise caution when using coffee bean extract and always consult with a healthcare provider before taking this supplement* [R].

Please note: *polyphenols and tannins from coffee may bind to iron and form insoluble complexes, which reduces iron absorption in the gut. If you have anemia, consult your healthcare provider before using coffee or coffee supplements.*

5



Beta-Glucans

IMPACT3 / 5

EVIDENCE3 / 5

How to implement

Take a beta-glucan supplement daily, with a dosage ranging from 250mg to 500mg. It is best consumed with a meal to enhance absorption. Continue this routine daily to support immune health.

Description

Beta-glucans are types of soluble fiber found in foods like oats and barley. They have been associated with immune system support and may help lower cholesterol levels when consumed as part of a heart-healthy diet.

Beta-glucan is a type of soluble fiber with antioxidant properties. It is abundant in [\[R\]](#) [\[R\]](#):

- Baker's yeast
- Cereals (e.g., oats, barley)
- Mushrooms (e.g., maitake)
- Seaweeds

People use beta-glucans to [\[R\]](#) [\[R\]](#) [\[R\]](#) [\[R\]](#) [\[R\]](#):

- Improve immunity (e.g., fight infections)
- Reduce blood sugar
- Reduce cholesterol

How it helps

In hypercholesterolemic subjects, beta-glucan supplementation **lowers fasting glucose (by 0.05 mmol/L) and fasting insulin (0.75 pmol/L)** according to a [meta-analysis of 12 trials and 603 participants](#) [\[R\]](#).

6



Paleo Diet

IMPACT

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EVIDENCE

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How to implement

Adopt a diet that includes lean meats, fish, fruits, vegetables, nuts, and seeds, resembling the diet of our hunter-gatherer ancestors. Exclude all dairy products, legumes, grains, added sugar, and processed foods. This should be a consistent dietary approach, not a short-term diet, to observe its benefits on health and well-being.

Description

The paleo diet, also known as the caveman diet, emphasizes whole foods such as lean meats, fish, fruits, vegetables, nuts, and seeds while excluding processed foods, grains, and dairy. It is believed to support weight management and reduce the risk of chronic diseases by focusing on foods more in line with our ancestors' diets.

How it helps

The Paleo diet significantly lowers fasting insulin levels by approximately 12.17 μ U/mL in individuals with metabolic disorders according to a meta-analysis of 10 studies. Another meta-analysis (21 studies) found a more substantial short-term impact of this diet on fasting insulin and insulin resistance than other diets. This diet was the only one that sustained lower insulin levels in the long term [\[R, R\]](#).

The Paleo diet may help by reducing your intake of processed foods and sugars, which lessens your body's demand for insulin.

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Pistachios

IMPACT

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How to implement

Incorporate a handful of pistachios (about 1-2 ounces) into your daily diet. You can add them to your breakfast cereals, salads, or simply snack on them throughout the day. Do this regularly for ongoing heart health benefits and to aid in maintaining a balanced diet.

Description

Pistachios are a type of nut native to Asia but grown extensively in the Mediterranean. They are packed with healthy fats, fiber, protein, and various vitamins and minerals, like vitamins C, B6, and E, as well as potassium, copper, and iron. They are also rich in antioxidant and anti-inflammatory compounds, which can help lower cholesterol levels and support weight management.

The pistachio (*Pistacia vera L*), known as **the “green nut”**, is a nut native to Asia but widely cultivated in the Mediterranean. Pistachios have **low fat content** and high levels of [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Unsaturated fats
- Vitamins (C, B6, E, K, thiamin)
- Minerals (Potassium, copper, iron, and magnesium)

Pistachios also have a high **antioxidant and anti-inflammatory** effect [\[R\]](#).

How it helps

Eating pistachios could help regulate blood sugar levels as they have a low glycemic index and are high in healthy fats, fiber, and protein. This helps slow down the digestion process and thus can prevent spikes in blood sugar after eating.

Four meta-analyses (the largest one with 17 studies) concluded that consuming pistachios lowers fasting glucose (by 3.62-5.32 mg/dL), insulin (by 1.86 µIU/mL), insulin resistance, and HbA1c. However, the results were mixed for insulin resistance and HbA1c [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

8



Kefir

IMPACT

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EVIDENCE

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How to implement

Incorporate kefir into your daily diet by drinking approximately 1-2 cups (240-480 ml) per day. It can be consumed on its own, blended into smoothies, or used as a base for salad dressings or soups. Continuous consumption over several weeks is recommended to observe its health benefits.

Description

Kefir is a fermented dairy product packed with probiotics, which can promote gut health and support digestion. Regular consumption of kefir is associated with improved digestive function and may enhance the immune system.

How it helps

Kefir is a probiotic-rich food that can help regulate the body's blood sugar levels, which is crucial for managing insulin. Its high protein content aids in slowing digestion and preventing spikes in blood sugar, contributing positively to insulin regulation.

A meta-analysis of 6 trials and 314 participants found that kefir reduced fasting insulin (by 3.69 mIU/mL) and HOMA-IR (by 2.56), but not HbA1c or fasting glucose. Another meta-analysis (6 trials) concluded that kefir reduces fasting glucose and insulin [\[R, R\]](#).

9



Chickpeas

IMPACT

3 / 5

EVIDENCE

2 / 5

How to implement

Incorporate chickpeas into your diet by adding them to salads, soups, and stews, or by making hummus. Aim for at least a half-cup serving, 3-4 times a week.

Description

Chickpeas, also known as garbanzo beans, are a good source of fiber, protein, and various vitamins and minerals. They can promote digestive regularity, provide sustained energy, and contribute to overall well-being when included in a balanced diet.

Chickpeas are a good source of minerals like manganese, iron, copper, zinc, and phosphorus, as well as folate and fiber. A ½ cup serving provides 0.9 mg of manganese or 39%DV.

How it helps

Chickpeas have demonstrated favorable effects on insulin response in several non-placebo-controlled trials. Consumption of chickpea bread reduced post-meal glucose while increasing insulin levels and insulinemic index. In women, a single chickpea meal lowered plasma glucose and improved insulin response. Prolonged chickpea-based dietary interventions also reduced fasting insulin levels and insulin resistance in healthy individuals [\[R, R, R\]](#).

Eating chickpeas can help prevent insulin resistance as they are rich in fiber, which slows down digestion and offers a steady supply of glucose to the blood. Plus, the proteins in chickpeas can further improve insulin sensitivity.

10



Oats

IMPACT

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EVIDENCE

3 / 5

How to implement

Incorporate oats into your diet daily by having them for breakfast as oatmeal, or adding them to smoothies, baking recipes, or overnight oats. Aim for at least a half-cup (40 grams) of dry oats to reap the health benefits.

Description

Oats are a whole grain known for their high fiber content and nutritional value, like zinc, iron, and manganese. Including oats in one's diet can promote heart health, stabilize blood sugar levels, and provide sustained energy.

Oats are a good source for manganese, zinc, iron, magnesium, and vitamins B1 and B5. A ½ cup serving provides 0.7 mg of manganese or 30%DV.

How it helps

Three meta-analyses (the largest one with 59 trials) found that oats interventions (20-136 g/day) decrease fasting glucose, fasting insulin, HbA1c, and glucose AUC [\[R\]](#), [\[R\]](#), [\[R\]](#).

A meta-analysis of 14 studies found that oats intake reduces HbA1c (by 0.42%), fasting glucose (by 0.39 mmol/L), total cholesterol (by 0.49 mmol/L), and LDL cholesterol (by 0.29 mmol/L) in diabetic patients [\[R\]](#).

Whole grains or thick flakes may be better than thin or instant flakes for lowering postprandial blood glucose according to a systematic review of 10 studies [\[R\]](#).

Oats contain beta-glucan, a soluble fiber that can improve insulin sensitivity.

11



Barberry

IMPACT

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EVIDENCE

3 / 5

How to implement

Take a barberry supplement of 500-1000 mg daily, divided into two or three doses with meals for up to 12 weeks. Do not exceed the recommended dose without consulting a healthcare provider.

TYPICAL STARTING DOSE
500 mg

Description

Barberry is an herbal remedy used in traditional medicine for its potential to support digestive health and reduce inflammation. It contains compounds that may have antimicrobial and antioxidant properties.

How it helps

Supplementation with barberry appears to have an impact on insulin levels without significantly affecting other glycemic control parameters, according to a meta-analysis of 7 studies. When a combination of barberry and milk thistle was administered to obese individuals with type 2 diabetes, it resulted in notable improvements in insulin and other parameters. Furthermore, this combination reduced the insulin dose needed for adequate glycemic control in patients with type 1 diabetes in another placebo-controlled trial [\[R\]](#), [\[R\]](#), [\[R\]](#).

Barberry contains berberine, which impacts glucose metabolism and insulin sensitivity.

12



Yacon

IMPACT

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EVIDENCE

2 / 5

How to implement

Incorporate yacon, which is a sweet-tasting root vegetable, into your diet by consuming 1-2 teaspoons of yacon syrup with meals daily to benefit from its prebiotic and blood sugar-lowering properties. Alternatively, yacon root can be eaten raw, baked, or made into tea. It's recommended to start with smaller amounts to assess tolerance.

Description

Yacon is a root vegetable native to South America and is used as a natural sweetener due to its high content of fructooligosaccharides. Yacon syrup or powder is often consumed for its potential prebiotic effects, promoting gut health and supporting weight management.

How it helps

In a placebo-controlled trial of 55 obese women, consuming yacon syrup (0.14-0.29 g/kg/day) for 120 days decreased fasting insulin and insulin resistance [\[R\]](#).

Yacon is rich in fructooligosaccharides, a type of sugar that the body doesn't absorb, thus helping to control blood sugar levels.

13



Dill

IMPACT

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EVIDENCE

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How to implement

Take a dill supplement in capsule form, as directed on the product label, typically once per day with water. Always follow the manufacturer's recommended dosage or the advice of a healthcare professional. It's essential to check the product label for specific dosage information.

Description

Dill is an herb known for its potential to aid digestion and provide antioxidant benefits. It can be used as a flavorful addition to meals and may support digestive comfort.

How it helps

Dill can help manage your insulin levels as it is known to stimulate the secretion of insulin, helping to lower blood sugar levels. However, it should be used as a supplement to regular diabetic treatment, not a replacement.

A meta-analysis of 7 trials (330 participants) found that *A. graveolens* supplementation lowered LDL-cholesterol, insulin levels, and insulin resistance, particularly in higher doses and long-term use, but had no impact on total cholesterol, triglycerides, or HDL, except for a drop in fasting blood glucose at 1500 mg/day [R].

In a single-blind, placebo controlled study with 150 hyperlipidemic patients, enteric-coated anethum tablet (650 mg, 2x/day for 6 weeks) **increased triglycerides (by 14.74 mg/dL, 6.0%), without changing total cholesterol and LDL-cholesterol** [R].

A single-center, randomized, double-blind, placebo-controlled study with 42 patients with type 2 diabetes found that dill (3 g/day for 8 weeks) **decreased insulin, homeostatic model assessment of insulin resistance, LDL-cholesterol, total cholesterol and malondialdehyde** although less than placebo. It also **increased HDL-cholesterol**, more than placebo, and total antioxidant capacity [R].

14



Berberine

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Take 500 mg of berberine two times a day before meals. Continue this regimen for up to three months, then evaluate its effects with your healthcare provider.

TYPICAL STARTING DOSE

1000 mg

Description

Berberine is a compound found in certain plants, known for its potential to support blood sugar control and heart health.

[Berberine](#) is an active compound of some plants used in traditional medicine, such as [\[R\]](#):

- European barberry
- Oregon grape
- Goldenseal
- Chinese goldthread
- Tree turmeric

Berberine is also available as a supplement. People use it to help with [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Diabetes
- High cholesterol
- High blood pressure
- PCOS

How it helps

A meta-analysis of 20 studies and 1761 participants concluded that supplementation with berberine lowers fasting insulin (by 2.36 mU/L) [\[R\]](#).

Berberine may help by improving insulin sensitivity and glucose breakdown.

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Kimchi

IMPACT

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EVIDENCE

2 / 5

How to implement

Incorporate about a half cup of kimchi into one of your daily meals. This could be as a side dish or part of the meal for at least one month to observe potential health benefits such as improved digestion.

Description

Kimchi is a fermented vegetable dish commonly consumed in Korean cuisine. It's packed with probiotics and nutrients, which can promote gut health and boost the immune system.

How it helps

Eating kimchi can boost your gut health, which has been linked with better insulin regulation. Additionally, it may increase insulin sensitivity lowering your risk for type 2 diabetes.

- In a [non-placebo-controlled trial of 100 healthy volunteers](#), consuming kimchi (15-210 g/day) for 7 days had a **dose-dependent lowering effect on fasting glucose, total glucose, TC, and LDL-C**. The lipid-lowering effects of kimchi were **stronger in people with TC above 190 mg/dL and LDL-C above 130 mg/dL** [\[R\]](#).
- In a [non-placebo-controlled trial of 22 overweight and obese participants](#), consuming kimchi (both fresh and fermented) for 4 weeks **lowered fasting glucose, fasting insulin, and total cholesterol, especially if fermented** [\[R\]](#).
- In a [non-placebo-controlled trial of 21 prediabetic participants](#), consuming fermented kimchi for 8 weeks **decreased insulin resistance and improved glucose tolerance** [\[R\]](#).
- In a [placebo-controlled trial of 40 prediabetic participants](#), supplementation with the kimchi-derived probiotic Lactobacillus plantarum HAC01 for 8 weeks **reduced 2h-PPG and HbA1c levels** [\[R\]](#).

16



Taurine

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Take 1-4 g of taurine supplement daily, divided into two or three doses with meals for optimal absorption. It can be taken continuously, with periodic evaluations of its effects and benefits.

TYPICAL STARTING DOSE

500 mg

Description

Taurine is an amino acid found in various foods and often used in energy drinks and supplements. It plays a role in neurological and cardiovascular health and can help support energy metabolism.

[Taurine](#) is the most abundant free amino acid in humans. It's not essential, which means we can produce it. We can also get it from protein-rich foods, such as [\[R\]](#):

- Seafood
- Meat
- Dairy

Taurine is a popular additive in energy drinks and can also be taken as a supplement [\[R\]](#).

Taurine plays an important role in [\[R\]](#), [\[R\]](#):

- Bile production
- Calcium metabolism

It is also well-known for its antioxidant and anti-inflammatory properties [\[R\]](#).

How it helps

Supplementation with taurine (3000 mg/day) for 8 weeks may decrease insulin in patients with type 2 diabetes [\[R\]](#), [\[R\]](#).

However, taurine (1.5 g/day for 8 weeks) may not affect insulin secretion or sensitivity in nondiabetic subjects [\[R\]](#).

17



Avoid Perchlorate

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

To avoid perchlorate, check water quality reports for your area to ensure your drinking water does not contain high levels of perchlorate. Also, limit consumption of foods known to have higher perchlorate levels, such as leafy green vegetables, dairy products, and fruits, or opt for organic versions of these foods as organic farming standards restrict certain chemicals.

Description

Perchlorate is a chemical that can interfere with the thyroid gland's ability to produce thyroid hormone. This can lead to a variety of health problems, including hypothyroidism, developmental delays, and cancer. Avoiding perchlorate can help to protect your health.

How it helps

A study of 11,433 participants associated high levels of urinary perchlorate with a 53% higher risk of diabetes and higher fasting glucose, HbA1c, insulin, and insulin resistance [R].

Perchlorate can disrupt the function of the thyroid gland, which plays a crucial role in regulating sugar and insulin processing.

18



Tocotrienols

IMPACT2 / 5

EVIDENCE1 / 5

How to implement

Take tocotrienols as a dietary supplement in doses ranging from 100 to 200 mg, 1-2 times a day, ideally with meals to enhance absorption. This intake can be continuous, but it's recommended to review its effects with a healthcare provider periodically, typically every 6 to 12 months.

TYPICAL STARTING DOSE

100 mg

Description

Tocotrienols are a form of vitamin E that helps to protect your cells. They fight harmful substances in your body called free radicals, which can damage our cells and lead to illness. By helping your body in this way, tocotrienols contribute to overall health, boosting immunity, and slowing down aging processes.

How it helps

In 2 randomized controlled trials of 77 individuals with prediabetes and 110 with type 2 diabetes, delta-tocotrienol (300-250 mg/day for 12-24 weeks) reduced fasting plasma glucose, HbA1c, insulin, and insulin resistance [R, R].

19



Spinach

IMPACT

2 / 5

EVIDENCE

1 / 5

How to implement

Incorporate one cup of fresh spinach or half a cup of cooked spinach into your daily diet. You can add spinach to salads, smoothies, omelets, or pastas to easily increase your intake.

Description

Spinach is a leafy green vegetable packed with essential nutrients, including vitamins A and K, iron, and folate. Incorporating spinach into the diet supports eye health, bone health, and overall nutrition.

Spinach is a good source of molybdenum, folate, calcium, and iron, as well as vitamins A, C, and K1. A ½ cup serving provides 8 mcg of molybdenum or 18%DV.

How it helps

In a [placebo-controlled trial of 48 women with PCOS](#), supplementation with spinach-derived thylakoid (5 g/kg/day) for 28 weeks **decreased insulin (by 4.21 µU/mL) and insulin resistance markers** [\[R\]](#).

Spinach can aid in controlling your blood sugar levels, which is a key aspect of managing insulin resistance. Additionally, its high magnesium content may improve your body's ability to use insulin effectively.

20



Green Peas

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate a half cup of cooked or raw green peas into your diet at least three times a week. This can be as a side dish, added to salads, soups, or pasta dishes.

Description

Green peas are a nutritious vegetable packed with vitamins, fiber, and antioxidants. Including green peas in your diet can support digestive health, provide essential nutrients, and contribute to overall well-being.

Green peas are a good source of folate, manganese, iron, vitamins C , K, and A, fiber, as well as antioxidants. A ½ cup serving provides 47 mcg of folate or 12%DV.

How it helps

Green peas contain fiber and protein, which can slow down the digestion process, leading to a slower release of sugars into the blood and therefore more stable blood sugar levels. Regular consumption can reduce the risk of insulin resistance, a condition that can lead to diabetes.

In a non-placebo-controlled trial of 9 patients with type 2 diabetes, consuming a meal with dired peas as carbohydrate source delayed and reduced postprandial plasma glucose and insulin responses [\[R\]](#).

21



Myo-inositol

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 2 grams of myo-inositol supplement orally twice a day, preferably with meals to enhance absorption. This regimen should be followed daily for at least 6 months to observe significant benefits.

TYPICAL STARTING DOSE

4 g

Description

Myo-inositol is a naturally occurring compound that plays a role in various cellular functions. It is used in dietary supplements and is believed to have potential benefits for mental health, hormone regulation, and insulin sensitivity.

Inositol is a type of sugar that our bodies need to function. It was considered a vitamin (vitamin B8) until it was discovered that our bodies can make it from another common sugar, glucose [R].

[Myo-inositol](#) is the most common form of inositol. It plays a role in [R, R, R, R]:

- Heart health
- Normal blood sugar levels
- Mental health
- Cognitive function
- Reproductive health

Myo-inositol can convert to [D-chiro-inositol](#) in the body. These two forms of inositol are often combined in supplements. People use them to improve blood sugar control and PCOS [R, R, R].

How it helps

In a 12-month study with 80 postmenopausal women and metabolic syndrome, myo-inositol (2 g b.i.d) showed significant improvements in glucose, insulin, HOMA-IR, triglycerides, HDL cholesterol, and blood pressure compared to placebo, while BMI and waist circumference remained unchanged [R].

22



Lactobacillus Casei

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Take a supplement containing Lactobacillus casei daily, with a dosage recommended by the product's manufacturer or a healthcare professional. The specific amount can vary, but it is commonly found in doses around 10 billion colony-forming units (CFUs). Continue this regimen for at least 4 weeks to observe potential health benefits.

TYPICAL STARTING DOSE
10 billion CFU

Description

Lactobacillus casei is a probiotic bacterium known for its potential to support gut health and immune function. It contributes to a balanced gut microbiome and may help alleviate digestive issues like diarrhea.

[Lactobacillus casei](#) is a [probiotic](#) bacterium found in fermented foods (e.g., cheese), as well as in the reproductive and gastrointestinal tracts of humans and other animals [\[R\]](#), [\[R\]](#).

People mainly take *L. casei* to support a healthy gut microbiota [\[R\]](#).

How it helps

In a placebo-controlled trial with type 2 diabetes patients, *L. casei* supplementation improved insulin levels [\[R\]](#).

L. casei can improve your gut health. Research shows a healthy gut can affect insulin resistance, an underlying cause of high fasting insuilm and glucose.

23



Rutin

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 500mg of rutin supplement daily, preferably with a meal to enhance absorption. Continue this supplementation regularly for at least 4 weeks to evaluate its benefits on your health, as effects may take some time to become noticeable.

Description

Rutin is a flavonoid found primarily in citrus fruits, buckwheat, and tea, and is known for its antioxidant and anti-inflammatory properties. It may support cardiovascular health and promote strong blood vessels.

How it helps

A double-blind, placebo-controlled trial with 50 type 2 diabetes mellitus patients found that rutin (500 mg/day for 3 months) decreased fasting blood glucose, insulin, HbA1c, HOMO-IR, LDL-c, TG, VLDL, total cholesterol, LDL-c:HDL-c ratio, atherogenic index of plasma (AIP), IL-6, and malondialdehyde (MDA), while increasing HDL-c, quantitative insulin sensitivity check index (QUICKI), BDNF, and total antioxidant capacity (TAC). Hence rutin may improve metabolic parameters, BDNF, and inflammatory and oxidative stress factors in T2DM patients [\[R\]](#).

In a prospective, randomized, controlled study conducted on 53 type 2 diabetes patients. rutin with vitamin C and vitamin C only reduced fasting blood glucose and LDL- and total cholesterol [\[R\]](#).

Rutin may help by improving insulin sensitivity.

Please note: *rutin may inhibit the production of the thyroid hormone T4 (thyroxine). Individuals with thyroid disorders, particularly hypothyroidism or low T4 levels, should exercise caution when using rutin and always consult with a healthcare provider before taking this supplement* [\[R\]](#).

24



Probiotics

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Take a probiotic supplement containing 10 billion or more live cultures once daily, preferably with a meal or as directed by the packaging or a healthcare provider.

TYPICAL STARTING DOSE

30 billion CFU

Description

Probiotics are live beneficial bacteria and yeasts that can support gut health and digestive function when consumed as supplements or found in fermented foods like yogurt and sauerkraut. They may be beneficial to gut health, immune function, blood sugar, and mood.

[Probiotic bacteria](#) are “good” bacteria found mainly in the large intestine. They support your body and mind by [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Maintaining gut health
- Supporting a healthy immune system
- Improving your mood
- Helping to maintain healthy blood sugar

Prebiotics are certain types of fiber and other complex carbs that serve as food for gut bacteria. **They support gut health by helping boost the activity and growth of “good” bacteria** [\[R\]](#), [\[R\]](#).

Prebiotics are also added to foods and supplements. Common prebiotic ingredients are [\[R\]](#), [\[R\]](#):

- Oligo-fructose
- Oligo-galactose
- [Inulin](#)

Mixtures of probiotics and prebiotics are known as **synbiotics** [\[R\]](#).

How it helps

In a placebo-controlled trial with type 2 diabetes patients, *L. casei* supplementation improved insulin levels [\[R\]](#).

25



Red Clover

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take a red clover supplement in the form of capsules, typically ranging from 40 to 80 milligrams daily. This should be done under the guidance of a healthcare provider, especially if you're using it for menopausal symptoms or bone health, to ensure it's appropriate for your individual needs. Generally, it's used for periods ranging from 3 to 12 months.

TYPICAL STARTING DOSE

40 mg

Description

Red Clover is a plant that's often utilized for its health benefits. Not just pleasing to the eyes with its bright color, it's known to help with skin health and menopause symptoms. Additionally, it may improve heart health and bone density. It's like a power-plant, offering multiple health benefits in one package.

How it helps

In a placebo-controlled trial of 36 participants, supplementation with red clover extract (1.9 g/day for 8 weeks) lowered fasting insulin by 0.75 µIU/mL [\[R\]](#).

26



Strawberries

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate a serving of strawberries, which is approximately eight medium-sized strawberries (about 1 cup or 150 grams), into your daily diet. You can enjoy them as a snack, add them to your breakfast cereal or oatmeal, blend them into smoothies, or use them as a topping for salads and desserts.

Description

Strawberries are a delicious fruit rich in vitamin C, antioxidants, and dietary fiber. They provide essential nutrients and are associated with various health benefits, including improved immune function and heart health.

Strawberries (*Fragaria ananassa*) are one of the most consumed berries, both fresh and processed in juices, jams, yogurts, and desserts [R].

Strawberries have a high content of antioxidants and vitamins, such as [R, R]:

- Vitamin C
- Folate
- Flavonoids

How it helps

Strawberries have a low glycemic index, meaning they raise your blood sugar slowly, which is beneficial for those with insulin resistance. They're also high in fiber, which can help control blood sugar levels by slowing digestion and preventing spikes in blood sugar.

In a randomized controlled study with 24 overweight adults, strawberry beverages attenuated the postprandial inflammatory response as measured by **hs-CRP and IL-6** induced by the high-carbohydrate, moderate-fat meal (HCFM). It is also **associated with a reduction in postprandial insulin response** [R].

In a parallel, double-blind, controlled, and randomized clinical trial in 41 free-living insulin-resistant non-diabetic overweight or obese human subjects, a beverage with strawberry and cranberry polyphenols (333 mg/day for 6 weeks) **increased insulin sensitivity and lowered first-phase insulin secretion response as measured by C-peptide levels**. However, it did not change lipids and markers of inflammation and oxidative stress [R].

27



Glutamine

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 5 to 10 grams of glutamine powder, mixed with water or another beverage, daily. It can be divided into two servings, one in the morning and the other in the evening. This supplementation is generally considered safe for long-term use, but it's best to consult with a healthcare provider for personalized advice.

TYPICAL STARTING DOSE

5 g

Description

Glutamine is an amino acid that plays a role in various bodily functions, including immune support and gut health. It may help with muscle recovery and overall well-being, particularly for individuals engaging in strenuous exercise.

L-glutamine is an amino acid produced by the body. Its levels may decrease during periods of stress or illness. It is important for protein and energy production, and helps control kidney pH balance [\[R\]](#).

Some people take L-glutamine as a supplement to help with [\[R\]](#):

- Gut health
- Immunity
- Exercise recovery and muscle performance
- Brain health

How it helps

In a placebo-controlled trial of 15 patients with type 2 diabetes, a single dose of glutamine (30 g) reduced the postprandial glycemic response, enhanced late postprandial insulinemia, and increased postprandial GLP-1. In another placebo-controlled trial (8 healthy volunteers, 8 healthy obese, and 8 obese with type 2 diabetes), glutamine (30 g) increased circulating GLP-1, GIP, and insulin [\[R\]](#), [\[R\]](#).

28



Akkermansia

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take Akkermansia muciniphila as a supplement in capsule form, usually one capsule per day. It is best consumed with a glass of water, preferably in the morning. Follow this routine for a duration as advised by a healthcare provider, but commonly for a period of at least 8 to 12 weeks to observe potential benefits.

Description

Akkermansia is a type of gut bacteria that resides in the human digestive system. It has been studied for its potential role in gut health and its association with metabolic and immune functions.

How it helps

In a placebo-controlled trial of 32 overweight or obese participants with insulin resistance, supplementation with *Akkermansia muciniphila* (10^10 cfu/day) for 3 months reduced insulin levels [\[R\]](#).

Akkermansia can improve insulin sensitivity, thus helping stabilize blood glucose and insulin levels.

29



Lactobacillus Acidophilus NCFM

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

TYPICAL STARTING DOSE

10 billion CFU

Description

[Lactobacillus acidophilus](#) is a [probiotic](#) bacterium that has been traditionally and widely used in the dairy industry to make yogurt [\[R\]](#).

More recently, *L. acidophilus* has been used as a probiotic. People take it to help with [\[R, R, R, R\]](#):

- High cholesterol
- Gut diseases
- Allergies
- Vaginal infections

L. acidophilus NCFM is a specific strain that may help relieve diarrhea, improve gut health, and boost the immune system. It can be taken as a supplement or found in some yogurts and other fermented foods.

How it helps

The combination of a diet richer in fruits and vegetables and supplementation with a synbiotic containing *L. acidophilus* NCFM and *Bifidobacterium lactis* HN019 decreased weight, fasting glucose, insulin resistance, insulin, and triglycerides better than either of these interventions alone in a non-placebo-controlled trial of 55 overweight or obese participants [\[R\]](#).

30



Amaranth

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate amaranth into your diet by adding it to your daily meals. You can use amaranth grains as a substitute for rice in dishes, add them to your morning porridge, or use amaranth flour in your baking recipes. Aim to include amaranth 2-3 times per week to reap its benefits.

Description

Amaranth is a nutritious, gluten-free grain-like seed that has been a staple in the diets of various cultures for centuries. It is rich in protein, fiber, vitamins, and minerals like calcium and iron. Amaranth is used to promote heart health, support digestion, and provide sustained energy.

How it helps

In a non-placebo-controlled trial of 81 obese participants, consuming amaranth seed oil (20 mL/day) as part of a 3-week weight-loss program improved insulin resistance, fasting insulin, and fasting glucose [\[R\]](#).

Amaranth is high in fiber, which slows sugar absorption and helps maintain blood sugar levels. Additionally, its magnesium content might aid the body in responding effectively to insulin.

31



Inositol

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take inositol as a daily supplement, usually available in powder or capsule form. The typical dosage ranges from 2 grams to 18 grams per day, divided into smaller doses taken with meals and water to aid absorption. It's important to start with a lower dose and gradually increase to avoid digestive side effects.

TYPICAL STARTING DOSE

2 g

Description

Inositol is a naturally occurring compound that plays a role in cell signaling and neurotransmitter function. It has been studied for its potential in promoting mental health and managing conditions like anxiety and depression when used as a supplement under the guidance of a healthcare professional.

Inositol is a type of sugar that our bodies need to function. It was considered a vitamin (vitamin B8) until it was discovered that our bodies can make it from another common sugar, glucose [\[R\]](#).

[Myo-inositol](#) is the most common form of inositol. It plays a role in [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Heart health
- Normal blood sugar levels
- Mental health
- Cognitive function
- Reproductive health

Myo-inositol can convert to [D-chiro-inositol](#) in the body. These two forms of inositol are often combined in supplements. People use them to improve blood sugar control and PCOS [\[R\]](#), [\[R\]](#), [\[R\]](#).

How it helps

In a 12-month study with 80 postmenopausal women and metabolic syndrome, myo-inositol (2 g b.i.d) showed significant improvements in glucose, insulin, HOMA-IR, triglycerides, HDL cholesterol, and blood pressure compared to placebo, while BMI and waist circumference remained unchanged [\[R\]](#).

32

Glycine

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 3 to 5 grams of glycine supplement per day with water, preferably before bedtime for sleep improvement or spread throughout the day for general health benefits. Continue indefinitely as needed, but consult a healthcare provider for long-term use beyond three months.

TYPICAL STARTING DOSE

3 g

Description

Glycine is an amino acid that may have calming and anti-inflammatory effects, potentially benefiting sleep quality and joint health.

If you can't get enough glycine from food sources, glycine supplements are available. Daily doses of up to **6 g** have been safely used for up to **4 weeks**. Consult your doctor before supplementing.

How it helps

In a placebo-controlled trial of 12 healthy volunteers with first-degree relatives with type 2 diabetes, supplementation with glycine (5 g/day) increased early, late and total insulin responses without changes in insulin action [R].

33

Jiaogulan (Gynostemma Pentaphyllum)

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take a capsule of jiaogulan (gynostemma pentaphyllum) containing 450 mg to 500 mg, three times a day with meals. Continue this routine daily for best results.

TYPICAL STARTING DOSE

1350 mg

Description

Jiaogulan, often referred to as the "immortality herb," is an herb used in traditional Chinese medicine for its potential adaptogenic and antioxidant properties. Some research suggests it may support overall well-being and longevity, but more studies are needed to confirm these effects.

[Gynostemma](#) (*Gynostemma pentaphyllum*), also called jiaogulan, is a climbing vine native to Southeast Asia. It is used in traditional Chinese medicine for [R]:

- High cholesterol
- Diabetes

People call it the "poor man's [ginseng](#)" because it may have similar benefits but cost less than Panax (Asian) ginseng [R, R].

How it helps

According to a [placebo-controlled trial of 56 patients with NAFLD](#), supplementation with Gynostemma pentaphyllum (80 mL for 4 months) as an add-on to a controlled diet may **lower BMI, AST, ALP, insulin, and HOMA-IR better than the diet alone** [R].

34



Saccharomyces Boulardii

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take Saccharomyces boulardii as an oral supplement, typically available in capsule or powder form, twice daily with a glass of water. Continue this regimen for 4-8 weeks, or as directed by a healthcare provider.

TYPICAL STARTING DOSE
10 billion CFU

Description

Saccharomyces boulardii is a beneficial yeast often used as a probiotic supplement to support digestive health and prevent or alleviate symptoms of diarrhea, including those caused by antibiotics or infections.

How it helps

In a placebo-controlled trial of 25 obese adults, supplementation with *S. boulardii* (5.0 × 10⁹ CFU, 2x/day) for 60 days decreased insulin (by 2.27 mcU/mL) [R].

S. boulardii may help regulate insulin levels indirectly by improving digestive function.

35



Raspberries

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate a half cup to one cup of fresh or frozen raspberries into your daily diet. You can add them to your breakfast cereal, blend them into a smoothie, or snack on them throughout the day.

Description

Raspberries are a type of berry native to Europe and Asia, known for their high vitamin C and dietary fiber content. They have astringent properties, can support immune health, and aid in digestion.

How it helps

In a study involving adults with prediabetes, consuming 125g or 250g of frozen red raspberries significantly lowered insulin response and glucose levels compared to control, suggesting improved glycemic control. However, another study found no significant impact of berries on glycemic response to starchy foods. Separate research indicated that raspberry supplementation reduced post-meal glucose and inflammation markers. Additionally, black raspberry fortification slightly improved glucoregulatory hormone response in young adults. Lastly, combining various berries with white or rye bread reduced insulin response, indicating potential benefits for glycemic control [R, R, R, R, R].

36

Aerobic Exercise (Cardio)

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Engage in at least 150 minutes of moderate-intensity aerobic exercise or 75 minutes of vigorous-intensity activity each week. Distribute this time over at least 3 days per week, avoiding consecutive days of vigorous exercise to allow for recovery.

TYPICAL STARTING DOSE

1 hour

Description

Engaging in regular aerobic exercise, such as running, swimming, or cycling, offers numerous health benefits, including improved cardiovascular fitness, weight management, and mood enhancement. It supports overall physical and mental well-being while reducing the risk of chronic diseases.

Cardio, short for cardiovascular exercise, is any type of physical activity that temporarily increases your heart rate. Examples include **running, cycling, swimming, and brisk walking**.

Regular cardio exercise has many benefits for your overall health. It can help lower your risk of heart disease and diabetes, support weight loss, and improve your mood and energy levels. To get the most out of cardio, try to do it for at **least 30 minutes, 3-5 times a week**.

Interval training is a type of cardio that combines periods of high-intensity training with brief rest periods.

How it helps

Aerobic exercise works to increase your body's insulin sensitivity, thereby helping the cells in your body use insulin more efficiently. This regimen can also aid in controlling your blood sugar levels, a key factor in managing Insulin resistance and diabetes.

A [meta-analysis of 13 studies](#) concluded that aerobic exercise **significantly reduces HbA1c and HOMA-IR in prediabetic individuals** [\[R\]](#).

Another [meta-analysis \(11 studies\)](#) found that structured exercise programs **reduce insulin resistance, HbA1c, fasting glucose and insulin, and BMI in patients with type 2 diabetes** [\[R\]](#).

In overweight and obese youth, aerobic exercise (over 60 min/session, at least 3 sessions/week for 12 weeks) **decreases insulin (by 4.52µU/mL), HOMA-IR, fasting glucose, and body fat** according to [2 meta-analyses \(the largest one with 17 studies\)](#) [\[R\]](#), [\[R\]](#).

37



Berries

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate a variety of berries such as strawberries, blueberries, raspberries, and blackberries into your daily diet. Aim for at least one cup of fresh or frozen berries every day, either as a snack, part of your breakfast (such as in oatmeal or yogurt), or as a dessert.

Description

Berries, such as strawberries, blueberries, and raspberries, are packed with antioxidants, vitamins, and fiber. Regular consumption of berries may support heart health, improve cognitive function, and contribute to overall well-being.

How it helps

In a study involving 27 overweight men on a high-fat diet, blackberries (600 g/day, 1500 mg flavonoids for 7 days) increased fat oxidation, lowered insulin levels (reduced AUC to 6485 vs. 8245 $\mu\text{U}\cdot\text{min}/\text{mL}$), and improved HOMA-IR compared to a control group (GEL) [\[R\]](#).

Berries are high in antioxidants and fiber, which can have a positive effect on insulin sensitivity.

38



Swimming

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate swimming into your routine for at least 30 minutes, 3 times a week. Choose a pace and stroke that keeps your heart rate elevated yet allows you to breathe comfortably. Continue this practice regularly for long-term health benefits.

TYPICAL STARTING DOSE

30 minutes

Description

Swimming is a whole-body workout that engages various muscle groups, promoting strength and endurance. It helps keep the heart and lungs healthy, improves flexibility, and can even help reduce stress. Regular swimming is a great way to maintain a balanced, fit, and healthy lifestyle.

How it helps

In a non-placebo-controlled trial of 116 sedentary women, supervised swimming for 6 months decreased insulin levels [\[R\]](#).

39



Restorative Yoga

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Engage in restorative yoga sessions for 20-30 minutes, at least three times a week. Choose a quiet, comfortable space where you won't be disturbed, using props such as yoga mats, bolsters, and blankets to support your body in relaxing poses.

TYPICAL STARTING DOSE

30 minutes

Description

Restorative yoga is a gentle and therapeutic form of yoga that involves holding poses for extended periods to promote relaxation, reduce stress, and improve flexibility and joint mobility.

How it helps

In a non-placebo-controlled trial of 135 patients with metabolic syndrome, practicing restorative yoga for 48 weeks decreased insulin, fasting glucose, and HbA1c [\[R\]](#).

Restorative yoga may help by reducing stress and promoting relaxation, which can decrease your body's insulin resistance.

40



Banaba

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 32-48 mg of a standardized banaba extract containing 1% corosolic acid, once daily with water. It is best taken with a meal for optimal absorption and effectiveness. Continue this supplementation for at least 2 weeks to potentially begin observing benefits such as improved blood sugar levels.

TYPICAL STARTING DOSE

32 mg

Description

Banaba, a plant traditionally used in herbal medicine, is believed to have potential benefits for blood sugar management and weight control. It is used in various dietary supplements and herbal remedies.

How it helps

In a placebo-controlled trial of 24 patients with metabolic syndrome, supplementation with banaba (500 mg, 2x/day) for 12 weeks lowered systolic blood pressure (by 5.2 mmHg), fasting glucose (by 0.2 mmol/L), VLDL-C (by 0.2 mmol/L), AUC insulin, and insulinogenic index [\[R\]](#).

Banaba may help by improving your body's insulin sensitivity.

41



Stair Climbing

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate stair climbing into your daily routine by choosing stairs over elevators or escalators whenever possible. Aim for at least 10 minutes of continuous stair climbing or multiple shorter sessions that add up to 10 minutes per day. This practice can be continued indefinitely to maintain or improve cardiovascular health and lower body strength.

TYPICAL STARTING DOSE

10 minutes

Description

Stair climbing is a great way to get a full-body workout, improve your cardiovascular health, and burn calories. It can also help to improve your balance and coordination.

How it helps

Brief stair-climbing exercise breaks during prolonged sitting reduced postprandial insulin and nonesterified fatty acids in overweight adults but had no significant effect on healthy-weight individuals' glucose, NEFA, or triglyceride levels [\[R\]](#).

Climbing stairs increases physical activity, helping your body use insulin more efficiently to control blood sugar levels. It also aids in weight loss, which can reduce insulin resistance.

42



Buckwheat

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate buckwheat into your diet by adding it to meals 2-3 times per week. You can use buckwheat flour for pancakes or bread, include buckwheat groats in soups, salads, or as a side dish instead of rice or pasta.

Description

Buckwheat is a gluten-free whole grain that provides essential nutrients, including protein, fiber, and minerals. It can contribute to heart health, digestive regularity, and balanced nutrition.

How it helps

Buckwheat is high in fiber and has a low glycemic index, which can slow the absorption of sugar into your bloodstream and reduce insulin and blood sugar levels. Incorporating buckwheat in your diet may lower your risk of developing insulin resistance, a precursor to type 2 diabetes.

In a non-placebo-controlled trial of 165 patients with type 2 diabetes, replacing a portion of staple food with tartary buckwheat (at least 110 g/day) for 4 weeks lowered fasting insulin and insulin resistance [\[R\]](#).

43



Pecans

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate about a handful of pecans (roughly 1 ounce or 28 grams) into your daily diet. You can eat them as a snack, sprinkle chopped pecans over salads, or blend them into smoothies. Aim to do this regularly as part of your daily dietary habits to enjoy their health benefits.

Description

Pecans are a type of nut derived from the hickory tree, primarily native to North America. They are rich in nutrients like healthy fats, protein, dietary fiber, and various vitamins and minerals, including vitamin E, manganese, and zinc.

Pecans are a good source of fiber, along with manganese, molybdenum, copper, thiamine, and zinc. A 1-ounce serving provides 1.1 mg of manganese or 48%DV.

How it helps

Pecans are high in healthy fats and fiber which slow down digestion, decreasing the rate of sugar absorption into your bloodstream and preventing spikes in insulin. Additionally, they contain antioxidants that may improve insulin sensitivity, helping your body use insulin more effectively.

In a non-placebo-controlled trial of 26 obese or overweight older adults, consuming a pecan-enriched diet (15% of total calories) for 4 weeks improved insulin, insulin resistance, and beta-cell function [\[R\]](#).

44



White Kidney Bean Extract

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take a supplement containing 500 to 1500 mg of white kidney bean extract before meals containing carbohydrates, once to twice daily. It's advisable to start with the lower dose to assess tolerance and gradually increase to the desired dose as directed on the product label or by a healthcare provider.

TYPICAL STARTING DOSE

500 mg

Description

White kidney bean extract contains compounds that inhibit the digestion of carbohydrates, potentially supporting weight management by reducing the absorption of calories from starchy foods.

[White kidney bean](#) is a variety of the common bean (*Phaseolus vulgaris*), which is native to South America. People use the extract of white kidney bean to [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Decrease appetite
- Support weight loss

How it helps

The withe kidney bean extract Beanblock, taken with a meal after a 12-hour fast, reduced appetite, production of the hunger hormone ghrelin, and postprandial glucose and insulin in a small trial of 12 healthy people [\[R\]](#).

Purified white kidney bean α-amylase blocker reduced postprandial glucose and insulin in a small trial of 8 non-insulin-dependent diabetics [\[R\]](#).

45



Hyperbaric Oxygen Therapy

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Schedule and attend sessions in a hyperbaric oxygen therapy chamber as your doctor prescribes, typically for about 60 to 90 minutes per session. The exact number of sessions required can vary based on the condition being treated, but it often ranges from 20 to 40 sessions, which may be conducted daily or a few times a week.

TYPICAL STARTING DOSE

90 minutes

Description

Hyperbaric oxygen therapy increases the amount of oxygen in the blood and tissues, which can help to improve circulation, reduce inflammation, and promote healing.

How it helps

In a non-placebo-controlled trial of 12 men with type 2 diabetes, receiving hyperbaric oxygen therapy for 2 hours decreased fasting blood glucose by 19% and increased insulin sensitivity by about one-third. The combination of hyperbaric oxygen therapy and autologous bone marrow stem cell transplantation (10 sessions over 180 days) decreased HbA1c, fasting glucose, and insulin requirements in a non-placebo-controlled trial of 23 patients with type 2 diabetes [R, R].

Hyperbaric oxygen therapy can improve the efficiency of insulin in the body by providing extra oxygen, thus enhancing cell function and glucose metabolism.

Please note: Hyperbaric oxygen therapy is a potentially dangerous procedure that should only be performed under medical supervision. People with pneumothorax or congestive heart failure are at especially high risk of adverse effects. Because highly concentrated oxygen can easily catch on fire, avoid potential fire sources around hyperbaric oxygen chambers, oxygen gas cylinders, tanks, and concentrators [R, R].

46



Sea Buckthorn

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 500mg of sea buckthorn oil capsules twice daily with meals for at least 3 months to see beneficial effects on skin hydration and elasticity.

Description

Sea buckthorn is a deciduous shrub native to Europe and Asia, and its fruits are rich in vitamins, particularly vitamin C, and antioxidants. It is used for its potential health benefits, including immune support and skin health.

How it helps

In a non-placebo-controlled trial of 18 healthy volunteers, eating a test meal with sea buckthorn decreased insulin at 30 min (by 39.6%) and 45 min (by 16.5%), as well as maximal insulin increase (by 23.6%) [R].

Sea buckthorn enhances pancreatic beta-cell function, which aids insulin production and regulation.

47



Moringa

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 400-800 mg of moringa leaf powder capsule form once daily, preferably with meals to enhance absorption. For fresh moringa leaves, a dose of 10 grams daily can be consumed directly or added to meals. Continue this regimen for at least 3 to 6 months to observe significant benefits.

TYPICAL STARTING DOSE

400 mg

Description

Moringa is a nutrient-dense plant known for its high levels of vitamins, minerals, and antioxidants. It is used in traditional medicine for a range of issues due to it's potential anti-inflammatory, antioxidant, and antimicrobial properties.

How it helps

Moringa supplements can help regulate insulin levels because they contain compounds that improve how the body metabolizes glucose. This could help protect against spikes in blood sugar levels, which is beneficial for people dealing with conditions such as diabetes where insulin function is impaired.

In a non-placebo-controlled trial of 10 healthy volunteers, a single dose of moringa leaf powder (4 g) increased mean plasma insulin (by 1.8 μ U/mL) [\[R\]](#).

48



Lettuce

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate fresh lettuce into your diet by adding it to salads, sandwiches, and wraps. Aim for at least one serving (approximately one cup of chopped lettuce) daily for general health benefits.

Description

Lettuce is a low-calorie, nutrient-dense leafy green that can be a valuable addition to a balanced diet. It provides essential vitamins and minerals while contributing to hydration and supporting overall health.

Lettuce is a good source of the vitamins A, C, and K, and minerals like chromium, calcium, and potassium. A 5-ounce serving provides 1.8 mcg of chromium or 5%DV.

How it helps

In a non-placebo-controlled trial of 16 healthy young adults, adding lettuce (100 g) to a moderately high-fat test meal reduced the postprandial insulin response [\[R\]](#).

Lettuce is low in carbohydrates and high in fiber. As a result, it can aid in blood sugar control and reduce insulin spikes.

49



L-Citrulline

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 1.5 to 5 grams of L-citrulline supplements per day, orally, with or without food. This dosage can be taken all at once or divided into two to three smaller doses throughout the day. It's generally recommended to start at the lower end of the dosage range and adjust based on your body's response.

TYPICAL STARTING DOSE

3 g

Description

L-citrulline is an amino acid that may help improve blood flow and reduce muscle soreness, making it a popular supplement for athletes and individuals with certain cardiovascular conditions. Its potential to enhance nitric oxide production supports vascular health and overall circulation.

[Citrulline](#) is an amino acid (protein building block). Citrulline can be found in foods like [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Watermelon
- Pumpkins
- Cucumber
- Bitter melon

The body uses L-citrulline to produce nitric oxide, a compound that helps widen blood vessels. It is important for heart and sexual health [\[R\]](#), [\[R\]](#), [\[R\]](#).

L-citrulline is commonly used as supplement to support [\[R\]](#):

- Blood vessel health
- Muscle health
- Metabolic health
- Sexual health

How it helps

L-Citrulline helps improve the body's insulin sensitivity by promoting greater nitric oxide production. This leads to better blood flow and nutrient uptake, assisting in glucose metabolism and overall insulin function.

In a placebo-controlled trial of 54 patients with type 2 diabetes, supplementation with citrulline (3 g/day) for 8 weeks lowered serum levels of insulin, glucose, HbA1c, and HOMA-IR [\[R\]](#).

50



Blackberries

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate a serving of blackberries into your daily diet, which is about 1/2 to 1 cup. You can add them to your morning cereal, blend them into a smoothie, or eat them as a snack.

Description

Blackberries are a delicious and antioxidant-rich fruit packed with vitamins and fiber. They can promote immune health, support digestive regularity, and contribute to overall well-being.

How it helps

In a study involving 27 overweight men on a high-fat diet, blackberries (600 g/day, 1500 mg flavonoids for 7 days) increased fat oxidation, lowered insulin levels (reduced AUC to 6485 vs. 8245 μ U·min/mL), and improved HOMA-IR compared to a control group (GEL) [\[R\]](#).

51



Artemisia Extract

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take an artemisia extract supplement, usually available in capsule form, with a typical dosage ranging from 200 to 400 mg daily. This should be taken with water, preferably after meals to reduce the risk of stomach upset. Follow the specific dosage recommended on the product label or by a healthcare provider for up to 4 weeks.

TYPICAL STARTING DOSE

200 mg

Description

Artemisia extract is derived from various species of the Artemisia plant, and it is used in traditional medicine for its potential medicinal properties. It is being studied for its possible role in supporting digestive health and immune function.

How it helps

Supplementation with *Artemisia dracunculus* (1000 mg before breakfast and dinner) for 90 days lowered systolic blood pressure (by 7 mmHg), HbA1c (by 0.2%), AUC of insulin, and total insulin secretion, while increasing HDL cholesterol, in a placebo-controlled trial of 24 patients with impaired glucose tolerance [\[R\]](#).

Artemisia extract may increase insulin sensitivity, thus improving glucose control in the body.

52



Brown Seaweed And Bladderwrack

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Take a brown seaweed and bladderwrack supplement according to the product's instructions, typically around 500-1000 mg daily, with meals to reduce the risk of stomach upset. It's important to check the label for specific dosage recommendations. This supplement is usually taken for periods of up to two months followed by a break or as directed by a healthcare professional.

TYPICAL STARTING DOSE

500 mg

Description

Brown seaweed, such as kelp and wakame, is a nutrient-dense marine plant often used in Asian cuisine and dietary supplements. It's a natural source of essential minerals like iodine and may offer various health benefits, including thyroid support and potential antioxidant effects. Bladderwrack is a type of seaweed that has been used for its potential health benefits, including iodine content that supports thyroid function.

How it helps

In a placebo-controlled trial of 65 patients with poor blood sugar control, supplementation with bladderwrack and brown seaweed extract for 6 months lowered fasting blood glucose, postprandial blood glucose, and HbA1c [R].

A study with 23 participants found that taking a seaweed blend before consuming carbohydrates led to a 12.1% reduction in insulin levels and a 7.9% increase in insulin sensitivity, without affecting glucose response [R].

53



Kiwifruit

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Eat one to two kiwifruits daily, either as a snack or incorporated into your meals. You can consume them for breakfast, add them to a salad for lunch, or blend them into a smoothie. Continue this practice as a regular part of your diet to gain its nutritional benefits.

Description

Kiwifruit is a vitamin C-rich fruit that supports immune health, digestion, and skin vitality. It's also a good source of dietary fiber, making it a nutritious addition to a balanced diet.

Kiwifruit are technically berries, full of vitamin E, fiber, other minerals and vitamins, particularly vitamin K and C. One kiwifruit provides 1.1 mg of vitamin E or 7%DV.

How it helps

Kiwifruit is high in fiber and fructose, which help regulate insulin levels by slowing down the absorption of sugar into the bloodstream. This way, you avoid sudden spikes in insulin, making it beneficial for people with insulin-related conditions.

A randomized controlled trial with 20 people found that a cereal meal with flaked wheat biscuit plus kiwifruit **reduced postprandial blood glucose response amplitude, and prevented subsequent hypoglycemia and hunger at 180 min** in comparison with the same meals plus kiwi sugars (glucose, fructose, sucrose 2:2:1) [\[R\]](#).

A randomized controlled crossover trial with Chinese adults found that preloading a rice meal with kiwifruit compared with consuming the rice meal in one sitting **reduced postprandial glycaemic peak concentration** (by 0.9 mmol/L), **glycaemic peak concentrations** (by 1.1 mmol/L), and **postprandial insulinemia area-under-the-curve** (by 1385 mU/L·min) after lunch. It did not change energy intake [\[R\]](#).

Another study found that whole kiwifruit pulp significantly reduced blood glucose response compared to sugar alone, while other kiwifruit components had lesser effects. Fiber and organic acids equally contributed to kiwifruit's anti-glycemic impact by slowing intestinal absorption [\[R\]](#).

54



Black Strap Molasses

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate 1 to 2 tablespoons of blackstrap molasses into your daily diet. You can consume it by mixing it with a cup of warm water or milk in the morning, or use it as a sweetener in your porridge, tea, or smoothies.

Description

Black strap molasses is a natural sweetener that contains minerals like iron, calcium, and magnesium. It can be a healthier alternative to refined sugars and offers potential benefits for bone health and overall nutrition.

How it helps

In a placebo-controlled trial of 38 healthy volunteers, consuming filtered sugarcane molasses concentrate (8-22 g) before a standard breakfast lowered postprandial insulinemic responses, especially in subjects with worse insulin sensitivity [\[R\]](#).

Black strap molasses is high in chromium, a mineral that enhances insulin's action in the body. It also contains magnesium, which can help maintain healthy blood glucose levels.

55



Low-Carbohydrate Diet

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Limit your daily intake of carbohydrates to less than 26% of your total daily calories. For a standard 2000-calorie diet, this means consuming no more than 130 grams of carbohydrates per day. Focus on including non-starchy vegetables, lean proteins, and healthy fats in your meals while minimizing the intake of sugars, bread, pasta, and other high-carb foods.

Description

Low-carbohydrate diets can promote weight loss, improve blood sugar control, and support heart health. They may also be beneficial for individuals with certain medical conditions, such as epilepsy or metabolic syndrome.

How it helps

Eating a low-carbohydrate, low-calorie diet may lower fasting insulin only in people with certain gene variants [R].

 PERSONALIZED TO YOUR GENES

Eating a low-carbohydrate, low-calorie diet may lower fasting insulin more in people with your [ADIPOQ](#) gene variant [R].

YOUR GENETIC VARIANTS			
GENE	SNP	GENOTYPE	EVIDENCE
ST6GAL1	rs1501299	GG	

56



Ascophyllum Nodosum

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take 100-200 mg of Ascophyllum nodosum extract daily with water. It is suggested to take this supplement in the morning to potentially benefit from its effects throughout the day. Continue daily use for at least 8-12 weeks to observe benefits.

TYPICAL STARTING DOSE

100 mg

Description

Ascophyllum nodosum is a type of brown seaweed commonly known as knotted wrack. It's used in various industries, including agriculture, cosmetics, and food production. In cosmetics, extracts of Ascophyllum nodosum are incorporated into skincare products for their moisturizing, antioxidant, and anti-inflammatory properties. Additionally, it's used as a food additive and supplement for its potential health benefits, such as improving thyroid function and supporting overall well-being.

How it helps

A study with 23 participants found that taking a seaweed blend before consuming carbohydrates led to a 12.1% reduction in insulin levels and a 7.9% increase in insulin sensitivity, without affecting glucose response [R].

Please note: *There is no evidence from controlled clinical trials to support this recommendation. It is included based on uncontrolled clinical trials, animal or cell studies, or non-scientific criteria. Please take this recommendation with a grain of salt until more research is available.*

57



Cruciferous Vegetables

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate a serving of cruciferous vegetables, such as broccoli, cauliflower, Brussels sprouts, kale, or cabbage, into at least one meal each day. A serving size is about a half cup cooked or one cup raw. Try to maintain this habit consistently over time for the best health outcomes.

Description

Cruciferous vegetables like broccoli, cauliflower, and kale are rich in vitamins, fiber, and antioxidants. Including them in your diet can promote overall health and may offer cancer-protective properties.

Cruciferous vegetables are a group of vegetables that belong to the Brassicaceae family. They are rich in fiber, vitamins, minerals, and other nutrients.

Some common cruciferous vegetables include broccoli, cauliflower, cabbage, kale, and brussels sprouts.

How it helps

High-fiber cruciferous vegetables can improve insulin sensitivity by lowering blood glucose levels.

How to implement

TYPICAL STARTING DOSE

200 mg

Description

Gymnema is an herb used in traditional medicine for its potential to support blood sugar control. Some studies suggest it may have benefits for individuals with diabetes, but it's important to consult with a healthcare provider before using it as a supplement.

[Gymnema](#) (*Gymnema silvestris*), also known as cowplant, gurmar, or periploca of the woods, is a plant originally from India. In Ayurvedic medicine, it is known as meshashringi or “the destroyer of sugar” because it temporarily **reduces the taste of sugar** on the tongue [R, R].

It is traditionally used for [R](#), [R](#):

- Diabetes
- Weight loss
- High cholesterol

How it helps

Gymnema sylvestre can contribute to the reduction of sugar absorption and improve the function of insulin.

59



Legumes

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate a serving of legumes, such as beans, lentils, chickpeas, or peas, into your diet at least four times a week. A serving size is approximately half a cup cooked. Ensure to prepare them properly by soaking and rinsing beans, if applicable, to reduce anti-nutrients and improve digestibility.

Description

Legumes, such as beans, lentils, and chickpeas, are excellent sources of plant-based protein, fiber, and various vitamins and minerals. Including legumes in your diet can promote satiety and support digestive health.

Legumes are plants from the *Fabaceae* family. Their edible seeds are called **pulses**. Legumes are important food staples and sources of carbohydrates, fiber, protein, iron, and other key nutrients.

Common legumes include:

- Peanuts
- Beans
- Chickpeas
- Peas
- Lentils

How it helps

Legumes are a good source of protein and fiber, potentially improving insulin sensitivity.

60



Bladderwrack

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take 300-500 mg of bladderwrack supplement daily, preferably with meals to enhance absorption. It's recommended to start with the lower dose and gradually increase if needed. Consult with a healthcare provider before beginning, especially if you are pregnant, nursing, or have a medical condition like hyperthyroidism.

TYPICAL STARTING DOSE

300 mg

Description

Bladderwrack is a type of seaweed that has been used for its potential health benefits, including iodine content that supports thyroid function.

How it helps

A study with 23 participants found that taking a seaweed blend before consuming carbohydrates led to a 12.1% reduction in insulin levels and a 7.9% increase in insulin sensitivity, without affecting glucose response [\[R\]](#).

Bladderwrack may help by improving insulin sensitivity.

61



Vegetables

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate at least 2-3 cups of various vegetables into your daily diet, ensuring a mix of colors like greens, reds, and yellows to maximize nutrient intake. Aim to include vegetables in most meals, either as a side, part of the main dish, or snacks.

Description

Vegetables are edible parts of plants that offer various health benefits due to their rich nutrient content, including vitamins, minerals, fiber, and antioxidants. They are essential components of a balanced diet and contribute to overall health, supporting various bodily functions.

How it helps

Non-starchy vegetables can help with insulin sensitivity due to their low glycemic load and high fiber content.

62



Chromium

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take a 200 mcg chromium supplement daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

200 mcg

Description

Chromium is a trace mineral that plays a role in insulin sensitivity and glucose metabolism. Adequate chromium intake through diet or supplements may help support blood sugar control and overall metabolic health.

[Chromium](#) (Cr) is a trace element. It helps regulate carb, fat, and protein breakdown [\[R\]](#).

Women need 20-25 micrograms (mcg) of chromium per day, while men need 30-35 mcg [\[R\]](#).

It’s easy to get chromium from your diet. Good sources include [\[R\]](#):

- Grape and orange juice
- Ham
- Beef
- Lettuce

You can also get chromium from supplements [\[R\]](#).

How it helps

Chromium assists insulin in the metabolism of sugar, which may improve blood sugar control and decrease insulin resistance.

63



American Ginseng

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take 200-400 mg of American ginseng extract daily, preferably with a meal to enhance absorption. This regimen can be followed continuously for up to 12 weeks, after which a break or reassessment of the need to continue should be considered.

TYPICAL STARTING DOSE

200 mg

Description

American ginseng is a perennial herb native to North America, particularly regions of the United States and Canada. It is valued for its potential health benefits, including immune system support, stress reduction, and enhanced cognitive function, with the primary active compounds being ginsenosides.

[Ginseng](#) is a plant people use to improve [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Sexual function
- Immunity
- Fatigue
- Attention

There are many different types of ginseng. The most common ones are [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Korean red ginseng, also called Asian ginseng (*Panax ginseng*)
- [American ginseng](#) (*Panax quinquefolius*)
- Chinese notoginseng, also called Sanchi (*Panax notoginseng*)

How it helps

American ginseng has been shown to have a glucose-lowering effect, which may aid in the control of blood sugar levels after meals.

64



Chia Seeds

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate 1 to 2 tablespoons of chia seeds into your daily diet. You can add them to yogurt, smoothies, oatmeal, or salads. Do this regularly as part of your daily meals.

Description

Chia seeds are high in fiber, omega-3 fatty acids, and various vitamins and minerals. Adding chia seeds to your diet can support digestive health, provide essential nutrients, and contribute to overall nutritional wellness.

Chia seeds are a healthy source of omega-3s, calcium, as well as fiber, iron, magnesium phosphorus, and vitamins B1 and B3. A 1-ounce serving provides 5.06 g of ALA.

How it helps

Chia seeds have a high fiber content that can slow the absorption of sugar, helping to regulate insulin.

65



Apple Cider Vinegar

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate 1-2 tablespoons of apple cider vinegar into your diet daily by diluting it in a large glass of water. Consume this mixture before meals to potentially benefit from its effects.

Description

Apple cider vinegar is a fermented liquid made from crushed apples and is known for its potential health benefits. It is rich in acetic acid and may aid in weight management, improve digestion, and help regulate blood sugar levels, often used as a natural remedy for various conditions like acid reflux and insulin resistance.

[Vinegar](#) is often used in cooking to add sour flavor and to preserve foods through pickling. Some people also use vinegar for cleaning [\[R\]](#).

Apple cider vinegar is one of the most common vinegars produced from apples. As a health food, apple cider vinegar may help [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Reduce blood sugar
- Lower cholesterol
- Fight infections

How it helps

Apple cider vinegar may lower blood sugar levels and enhance the effects of insulin.

66



Low-Intensity Exercise

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate 60 minutes of low-intensity activities, such as walking or gentle yoga, into your daily routine. Aim to do this 5 days a week to achieve the best results.

TYPICAL STARTING DOSE

1 hour

Description

Low-intensity exercise, such as walking or gentle yoga, provides numerous health benefits, including improved cardiovascular health, stress reduction, and enhanced overall fitness without the strain of high-intensity workouts.

How it helps

Engaging in low-intensity exercise can help in managing blood glucose levels and increasing insulin sensitivity.

67



Cinnamon

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take a 1 g cinnamon supplement once daily, ideally with a meal to aid absorption. This can be in the form of a capsule or tablet. Continue this regimen as long as it aligns with your health goals and under the guidance of a healthcare provider.

TYPICAL STARTING DOSE

1 g

Description

Cinnamon is a popular spice that may have various health benefits, including improving blood sugar control, reducing inflammation, and providing antioxidants. It's commonly used in both culinary and herbal applications.

[Cinnamon](#) is a spice made from the bark of *Cinnamomum* trees. Cinnamon can [\[R\]](#):

- Decrease inflammation
- Fight [oxidative stress](#)
- Kill microbes

Cinnamon is mainly used in cooking and fragrances. **As a natural remedy, people use cinnamon to reduce blood sugar** [\[R\]](#).

There are two main types of cinnamon [\[R\]](#):

- Ceylon or ‘true’ cinnamon (*Cinnamomum verum*)
- Chinese or Cassia cinnamon (*Cinnamomum cassia*)

How it helps

Compounds in cinnamon have been found to improve insulin sensitivity and may mimic insulin's effects and increase glucose transport.

68



Fenugreek

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take a 500 mg fenugreek supplement daily, preferably with a meal to aid in digestion and absorption.

TYPICAL STARTING DOSE

500 mg

Description

Fenugreek is an herb and spice commonly used in traditional medicine for its potential to support digestive health, regulate blood sugar levels, and promote lactation in nursing mothers. Its compounds, such as soluble fiber and fenugreek seeds, contribute to its various health benefits.

[Fenugreek](#) is a leafy green legume originating from central Asia. Its leaves and seeds are both used in cooking. Some people also use the seeds to make tea [[R](#), [R](#)].

People use fenugreek tea or supplements for [[R](#), [R](#), [R](#), [R](#)]:

- Reproductive health
- Blood sugar control
- Decreasing cholesterol

How it helps

Fenugreek may help control blood sugar levels by improving insulin function due to its high soluble fiber content.

69



Bitter Melon Supplement

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take a bitter melon supplement in the form of capsules or tablets, typically ranging from 500 mg to 1000 mg per day, split into two to three doses before meals. It's recommended to follow the dosage instructions on the product label or consult a healthcare provider for personalized advice. Continue for as long as recommended by the healthcare provider, usually a few weeks to months, to monitor effectiveness and tolerance.

TYPICAL STARTING DOSE

500 mg

Description

Bitter melon supplements are often used in traditional medicine for their potential to support blood sugar control. They contain compounds that may help regulate glucose metabolism and promote overall metabolic health.

How it helps

Bitter melon contains compounds that have been shown to act on glucose metabolism, aiding in lowering blood sugar levels.

70



Quinoa

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate quinoa into your diet by replacing rice or pasta with it in meals. Aim for 1-2 servings, which is about 1/2 to 1 cup cooked, 2-3 times a week to benefit from its high protein, fiber, and mineral content.

Description

Quinoa is a nutrient-rich, gluten-free grain-like seed originating from South America. It is packed with protein, fiber, B-vitamins, vitamins A, C, and E, as well as minerals like calcium phosphorus, iron, and zinc, making it a valuable addition to diets for promoting muscle health, aiding digestion, and providing essential nutrients.

[Quinoa](#) (*Chenopodium quinoa Willd*) is a flowering plant native to The Andes in South America. There, it is a **food staple for indigenous cultures** [\[R\]](#), [\[R\]](#), [\[R\]](#).

Quinoa is famous for its seeds, which are **gluten-free and high in protein**. In comparison with many grains, quinoa seeds have a greater amount of many nutrients, including [\[R\]](#), [\[R\]](#):

- Fiber
- [Fatty acids](#) (e.g., linoleic and α-linolenic acid)
- Vitamins (e.g., B1, B2, B6, C, and E)
- Minerals (e.g., calcium, phosphorus, iron, and zinc)

Quinoa seeds can be used whole or ground to a fine powder and shaped into flakes before use [\[R\]](#).

How it helps

Quinoa has a favorable effect on blood sugar control, which can benefit insulin regulation.

71



DASH Diet

IMPACT

0 / 5

EVIDENCE

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How to implement

Adopt a dietary pattern that emphasizes fruits, vegetables, whole grains, lean proteins, and low-fat dairy, while reducing sodium, red meat, sweets, and sugary beverages. Aim for 4-5 servings of both fruits and vegetables per day, 6-8 servings of grains (with at least half being whole grains), and 2-3 servings of low-fat dairy. This diet should be followed daily to manage blood pressure effectively.

Description

The DASH (Dietary Approaches to Stop Hypertension) diet is a dietary plan designed to reduce high blood pressure. It emphasizes fruits, vegetables, lean proteins, and whole grains while limiting sodium intake.

Health experts developed the DASH diet to reduce blood pressure. This diet also helps support weight control while reducing inflammation and cholesterol [\[R\]](#).

It **limits salt, sweets, and saturated fat**, while promoting the intake of [\[R\]](#):

- Fruits (4-5 servings/day)
- Vegetables (4-5 servings/day)
- Whole grains (6-8 servings/day)
- Low-fat dairy (2-3 servings/day)
- Nuts, seeds, and legumes (4-5 servings/week)
- Fish and poultry (up to 6 ounces/day)

The DASH diet focuses on fresh, minimally processed food rich in nutrients. Magnesium, calcium, and potassium-rich foods are particularly important due to their beneficial effects on the heart and blood vessels [\[R\]](#).

Although similar to the [Mediterranean diet](#), DASH is lower in sodium (<2,300 mg a day) and omega-3 fatty acids. On the other hand, it’s higher in red meat and dairy [\[R\]](#).

How it helps

The DASH diet promotes foods that may lower insulin resistance and enhance insulin sensitivity.

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Brown rice

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How to implement

Replace white rice with brown rice in your meals. Aim to consume brown rice 3-4 times a week, incorporating it into dishes such as stir-fries, salads, or as a side to your main protein source. Start with a serving size of about 1/2 to 1 cup of cooked brown rice per meal.

Description

Brown rice is a whole grain rich in fiber, vitamins, and minerals. It provides sustained energy, supports digestive health, and contributes to overall nutritional well-being.

Brown rice contains a host of B-vitamins including thiamine, and minerals like magnesium, phosphorus, manganese, and selenium. A ½ cup serving provides 0.1 mg of thiamine or 8%DV.

How it helps

Choosing brown rice over white rice can help maintain healthy blood sugar levels, benefiting insulin responsiveness.

Next Steps

Remember, your genes only tell one important part of your health story!

Now that you've seen your DNA-based results for this health topic, let's take a look at other contributing factors.

Your lab results

Your lab results are impacted by the combined effect of your genes, environment and lifestyle.

Lab tests will give you the best picture of your current health status, while your genes provide insight into your health predispositions and which recommendations are best for you.

	Glucose, Fasting	97 mg/dL		9 Nov 2025
	Vitamin D, 25-Hydroxy, Total	58.59 ng/mL		9 Nov 2025
	Insulin, Fasting	9.08 uU/mL		9 Nov 2025