



Diet tips to improve insulin resistance




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By [Adam Felman](#) — Updated on Mar 3, 2023

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Dietary choices that support insulin resistance include non-starchy vegetables, whole grains, and citrus fruits. At the same time, a high intake of sugary drinks and highly processed foods may make it worse.

Insulin is a hormone that helps the body absorb glucose and keeps blood sugar levels balanced. Insulin resistance makes it harder for the body's cells to take in glucose.

[Insulin resistance](#) occurs when the cells in the body cannot use [insulin](#) effectively. Over time, insulin resistance [can cause](#)  a range of health problems, including damage to the organs, muscles, limbs, and eyes.

People with insulin resistance may receive a diagnosis of [prediabetes](#), which can progress to [type 2 diabetes](#). A person who has insulin resistance may need routine checkups with a doctor to ensure that they do not develop type 2 diabetes.

Certain diet and lifestyle habits can affect the risks related to insulin resistance. In fact, eating or limiting certain foods [can improve](#) insulin sensitivity, reduce insulin resistance, and decrease a person's risk of developing type 2 diabetes.

This article will explore the dietary and lifestyle changes a person can

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Foods to eat



A balanced diet may help people manage their blood sugar levels. Image credit: Vgajic/Getty Images

Many people do not consume enough [magnesium](#), [calcium](#), fiber, and [potassium](#), all of which [are essential](#) [👤] for regulating blood sugar levels. Therefore, it is important for people with insulin resistance to include plenty of foods rich in these nutrients in their diet.

Additionally, although people with insulin resistance do not need to

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The following foods may [support](#) insulin sensitivity and reduce the risk of developing diabetes in general:

- non-starchy [vegetables](#) such as broccoli, dark leafy greens, tomatoes, and peppers
- citrus fruits such as lemons, oranges, and limes
- high fiber foods, including beans, lentils, nuts, and seeds
- whole grains such as oats, [quinoa](#), and barley
- protein-rich foods, including lean meats, fish, soy, legumes, and nuts
- fish with high [omega-3](#) fatty acid content, such as salmon, sardines, and herring
- foods that contain [antioxidants](#), such as berries
- water, especially as a substitute for sweetened drinks
- unsweetened teas
- unsweetened yogurt

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Foods to limit

Certain foods are more likely to raise blood sugar. Regularly eating foods

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Over time, this [can also lead](#) to high amounts of insulin in the blood, which can cause cells to become more resistant to insulin's effects.

When this happens, the glucose remains in the blood, contributing to the health concerns that [accompany](#) consistently raised blood sugar, such as damage to the kidneys (nephropathy) or the limbs ([neuropathy](#)).

Limiting the following foods [may help](#) moderate blood sugar levels:

- sweetened beverages, including fruit juices, soda, and fountain drinks
- alcohol, especially in large quantities
- [highly processed snacks](#), convenience meals, and boxed foods
- sugary sweets such as cupcakes, ice cream, and chocolate bars
- [refined grains](#) such as white bread, rice, pasta, and flour-based foods, which are lower in fiber than whole grain versions
- fried foods
- foods high in [saturated fats](#), including chocolate, butter, and red meat

Finding a healthy balance

People can still eat foods on this list occasionally without negatively affecting long-term insulin sensitivity. The key is to limit these foods and replace them with more nutritious options when possible.

By sticking to a nutritious, [high fiber diet](#) that is low in added sugars, a person can steadily improve their insulin sensitivity.

Regular physical activity can also be helpful. Taking walks regularly or staying active throughout the day can significantly [improve](#) blood sugar regulation.

Additionally, some people may be able to reduce their risk of developing type 2 diabetes by losing [5–7%](#) of their body weight.

These changes can also reduce a person's risk of heart disease and other health conditions.

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Diet tips



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Following a balanced diet plan that includes foods from a variety of cultures can improve insulin sensitivity.

For example, the [Mediterranean diet](#) is a diet plan inspired by a specific culture that [involves](#) eating lots of seasonal, plant-based foods, such as fruits and vegetables, and using olive oil as the primary source of fat. People following this diet eat fish, lean meats, legumes, and nuts as main protein sources and enjoy dairy products in moderation.

People following the Mediterranean diet also limit their intake of red meat and may consume red wine in moderation during meals.

In a large 2018 study, researchers found that women who followed the Mediterranean diet had about a [25% reduced risk](#) of cardiovascular health conditions, including factors such as insulin resistance.

However, the Mediterranean diet is just one option for healthy eating. Other diet plans, such as the DASH (Dietary Approaches to Stop Hypertension) diet, may also [help improve](#) insulin resistance.

This DASH diet [provides](#) daily and weekly nutritional goals and specifies the amounts of certain food groups a person should aim for each day, including fruits, vegetables, whole grains, low fat dairy, fats and oils, and meat, fish, or poultry.

These diets can work well when a person combines them with other healthy lifestyle practices, such as [stress](#) management, adequate sleep of 7–9 hours per night, and regular physical activity.

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Glycemic index

One way to manage blood sugar levels and reduce insulin resistance is to eat foods with a low [glycemic index \(GI\)](#) and glycemic load (GL).

The GI [lists](#) carbohydrate-containing foods according to how quickly they increase the glucose levels in a person's blood. GL [accounts for](#) both the GI of a food and the serving size.

[Carbohydrate foods](#) with a high GI and GL can cause blood sugar spikes and put more demand on the body to produce insulin. Conversely, the digestive system processes foods with a low GI and GL slowly, which reduces blood sugar spikes.

Eating foods with a low GI and GL is an excellent way to maintain balanced blood sugar levels and preserve insulin sensitivity. This category includes many fruits and vegetables, whole grains, and legumes.

Understanding insulin resistance

The body needs glucose for energy. However, many cells cannot absorb glucose without assistance.

The pancreas [releases](#) insulin into the bloodstream. The insulin then helps the glucose travel to the body's cells, which use it for energy.

Insulin allows cells to absorb glucose, making sure that blood sugar levels remain at a safe level and that the cells in muscle, fat, liver, and other areas can get energy

When a person has insulin resistance, their cells are less sensitive to insulin. This means the pancreas has to produce more insulin to keep blood sugar levels stable.

If the pancreas cannot keep up with the increased demand for insulin, blood sugar levels rise. If the cells cannot use all the excess glucose in

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Causes

Genetic factors [may increase](#) the risk of insulin resistance. However, lifestyle factors also make a difference.

Certain daily habits can decrease insulin resistance and the risk of diabetes.

Diet

Diet affects insulin resistance in at least two major ways.

First, consuming too many [calories](#) can trigger weight gain. According to one study in middle-aged adults, weight gain [increases](#) the risk of insulin resistance. However, regular physical activity [can counteract](#) these effects.

Second, various types of foods may have different effects on insulin resistance and blood sugar levels.

A person should follow a balanced diet and [prioritize](#) foods high in fiber, protein, and [heart-healthy fats](#). A doctor or dietitian may provide advice on which foods to eat to maintain steady blood sugar levels.

Body weight

People with excess fat around their waist and abdomen, in particular, are at a higher risk of developing insulin resistance. Though the mechanism is not entirely clear, some researchers [believe](#) that fat cells secrete hormones and other substances that may interfere with insulin's effectiveness.

Excess fat around the waist might also relate to chronic [inflammation](#). This [can trigger](#) a wide range of health problems, including insulin resistance.

However, body weight is just one factor that may contribute to insulin resistance. Having overweight or obesity does not mean that a person will develop insulin resistance.

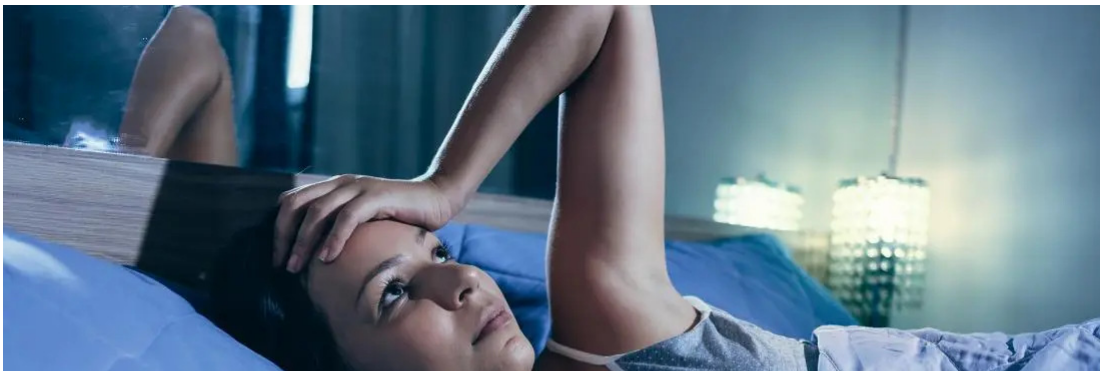
A person can work with a doctor or dietitian for personalized guidance on whether diet and lifestyle changes may be beneficial.

Sedentary lifestyle

Not getting enough exercise can affect the way insulin regulates blood sugar levels. According to the [American Diabetes Association](#), physical activity plays a vital role in keeping blood sugar levels steady.

Aim for around [30 minutes](#) of exercise per day, at least 5 days per week. A person can also add more activity to their daily routine by taking the elevator instead of the stairs, going for a walk during their lunch break, or using a standing desk.

Other risk factors



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- **Smoking:** This can impair [✓] insulin sensitivity and insulin production.
- **Sleep issues:** Losing just 1–3 hours [✓] of sleep per night can increase insulin resistance.
- **Age:** People aged 45 or older [✓] might have a higher risk of insulin resistance.
- **Use of steroids:** Taking this type of drug can increase insulin resistance by 60–80% [✓], depending on dose.
- **Underlying health conditions:** High blood pressure, previous episodes of [stroke](#) or [heart disease](#), and polycystic ovary syndrome can all increase a person’s risk of developing insulin resistance.
- **Hormonal disorders:** Disorders that affect hormone production, such as [Cushing’s syndrome](#) and acromegaly, can disrupt insulin sensitivity.
- **Race:** People of African American, Hispanic, Native Alaskan, American Indian, Native Hawaiian, and Pacific Islander descent have a higher risk of insulin resistance.

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Insulin resistance means that the body's cells become less effective at absorbing glucose from the blood. It is common in prediabetes, a condition that can progress to type 2 diabetes.

Diet plays an essential role in preventing insulin resistance. Following a balanced diet and increasing physical activity can reduce a person's risk. Adding more foods that are high in fiber, protein, and heart-healthy fats to the diet can be beneficial.

Managing underlying health conditions, getting plenty of sleep, and managing [stress levels](#) can also help promote overall health and improve insulin resistance.

Q:

Does prediabetes always turn into diabetes?

–

A:

A diagnosis of prediabetes does not mean that you will definitely advance to diabetes, though it is a high risk factor.

The good news is that prediabetes is reversible. Evidence shows that there is up to a 58% reduction in the risk of developing diabetes when a person makes and sustains healthy lifestyle changes.

These include reducing total carbohydrate intake; switching from processed carbs to high fiber, low GI carbs; losing weight; doing daily exercise; getting good quality sleep for 7–9 hours a night; and managing stress.

– *Natalie Butler, RD, LD*

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High insulin sensitivity allows the cells of the body to use blood glucose more effectively, reducing blood sugar. Some lifestyle and dietary changes may help increase insulin sensitivity.

[Insulin](#) is a hormone that helps the body control the level of sugar, or glucose, in the blood. Insulin sensitivity varies between people and can change according to various lifestyle and dietary factors.

A person with low insulin sensitivity also has [insulin resistance](#), which affects about [38%](#) of adults in the United States. People with [insulin resistance](#) have a higher risk of developing [type 2 diabetes](#).

Improving insulin sensitivity and reducing insulin resistance may benefit those who have or are at risk of type 2 diabetes.

While the prevalence of prediabetes [is similar](#) across racial and ethnic groups, the prevalence of diabetes [is higher](#) among American Indians, Alaska Natives, Hispanic Americans, and non-Hispanic Black Americans than among white Americans. This means that people from historically marginalized groups may develop the condition sooner or at a faster rate.

This article looks at lifestyle and dietary factors that may help a person improve their insulin sensitivity using natural therapies and products.

People who wish to increase their insulin sensitivity can try the following lifestyle changes:

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1. Getting more exercise

Exercise may be one way to improve insulin sensitivity.

A [2018 review](#) of 11 studies found an association between increased physical activity levels and improved insulin sensitivity.

The review recommends a structured exercise program as part of managing type 2 diabetes.

Exercise also uses some glucose in the blood, bringing blood glucose levels further into typical ranges.

Combining different exercises

The findings of a [2013 review](#) suggest that certain types of exercise may increase insulin sensitivity more than others. The authors found that a combination of aerobic exercise and strength training was particularly effective for people both with and without [diabetes](#).

According to their findings, the authors made the following recommendations for these groups:

- **People without diabetes:** Do at least 30 minutes of exercise five times a week. This exercise should include high intensity aerobic exercise three times a week and strength training in all major muscle groups twice a week.
- **People with type 2 diabetes:** Do at least 30 minutes of exercise five times a week. They should perform long duration, moderate intensity aerobic exercise three times a week and high-repetition resistance training in all major muscle groups twice a week.
- **People with type 2 diabetes and limited mobility:** Do as much exercise as they can manage. They should aim to include low

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2. Getting more sleep

Getting more sleep may also improve insulin sensitivity.

In a [2015 study](#), 16 healthy people who were not getting sufficient sleep extended their sleep by 1 hour per day for 6 weeks. This extra sleep increased insulin sensitivity.

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3. Eating a nutritious diet


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Fewer carbohydrates, more unsaturated fats

Recent research suggests that replacing [carbohydrates](#) with unsaturated fats may improve insulin sensitivity in some people.

A [2015 study](#) investigated the effects of a low carbohydrate diet on insulin sensitivity in adults at risk for type 2 diabetes. The researchers concluded that eating a diet low in carbohydrates can help improve insulin sensitivity in people with a BMI of over 30 or those with other risk factors for diabetes, such as [polycystic ovary syndrome](#).

However, a more recent [review from 2018](#)  suggested that a low carbohydrate diet might actually increase insulin resistance, especially if a person is not losing [body weight](#) while following the diet.

A [2016 systematic review](#) of 102 studies concluded that replacing carbohydrate and saturated fat with polyunsaturated fat may improve the body's blood sugar regulation.

More soluble fiber

Soluble fiber is a type of dietary fiber that comes from plants.

Although this fiber is a type of carbohydrate, the body cannot break it down fully. As a result, it does not contribute to spikes in blood glucose levels.

Soluble fiber also delays gastric emptying, which is the time it takes for a meal to leave the stomach and enter the small intestine. A small [2014 study](#) suggests that this delay may help decrease blood glucose levels after meals in people with type 2 diabetes.

Intermittent fasting

Intermittent fasting is a type of diet that focuses on the timing of meals rather than the specific foods in the diet. It may improve insulin sensitivity and reduce the risk of type 2 diabetes for certain people.

A [2014 review](#) investigated the effects of two methods of intermittent fasting in overweight and obese adults. The first involved restricting calorie intake for 1–3 days per week and eating freely on the remaining days. The other involved alternating between fast days and feed days, with people reducing their regular calorie intake by 75% on fast days and eating freely on feed days.

As with a daily calorie-restricted diet, the researchers found that both types of intermittent fasting reduced insulin resistance. However, this type of eating had no meaningful effect on blood glucose levels, so the authors concluded that more research is necessary.

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4. Taking dietary supplements

In addition to changing the foods in their diet, people looking to increase their insulin sensitivity may benefit from taking dietary supplements.

According to research, the following supplements could reduce insulin resistance.

Probiotics and omega-3 fatty acids

Taking probiotics or [omega-3](#) fatty acid supplements may improve insulin sensitivity in people who are overweight.

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otherwise healthy.

The researchers reported that taking either a probiotic or omega-3 supplement for 6 weeks led to significant improvements in insulin sensitivity in comparison with a [placebo](#).

The increase in insulin sensitivity was even greater in those who took both supplements together.

[Learn everything you need to know about probiotics.](#)

Magnesium


[Magnesium](#) supplements may also be beneficial for people wanting to improve their insulin sensitivity.

A [2016 systematic review](#) found that taking magnesium supplements for more than 4 months significantly improved insulin resistance in people with and without diabetes.

[Read more about magnesium glycinate, a popular supplement.](#)

Resveratrol

Resveratrol is a natural compound that occurs in the skin of red grapes. It is also available as a dietary supplement.

A [2014 meta-analysis](#)  of 11 studies found that taking resveratrol supplements significantly improved glucose control and insulin sensitivity in people with diabetes. However, the researchers did not observe the same effects in people without diabetes. They concluded that there is a need for more research on the effects of resveratrol supplementation in humans.

Takeaway

Low insulin sensitivity is a risk factor for developing type 2 diabetes.

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unsaturated fats and soluble fiber may help improve insulin sensitivity in people with and without diabetes.

Certain dietary supplements may also be beneficial. Many of these supplements are available to purchase online:

- [probiotic supplements](#)
- [omega-3 supplements](#)
- [magnesium supplements](#)
- [resveratrol supplements](#)

However, a person should be aware that the Food and Drug Administration (FDA) does not regulate supplements. Therefore, they should speak with their doctor before taking any supplement.

Individuals can discover more resources for living with type 2 diabetes by downloading the free T2D Healthline app. It provides access to expert content and peer support through one-on-one conversations and live group discussions. Download the app for [iPhone or Android](#).

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