

Beef Spikes Insulin More Than Pasta

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Theme: [Science and Medicine](#)

Global Research, October 16, 2024

[Mercola](#)

Beef causes a greater insulin release than white pasta, challenging common beliefs about carbohydrates and insulin

*High carbohydrate and sugar intakes are not associated with insulin resistance and diabetes; **increasing carbohydrate consumption can actually increase insulin sensitivity***

Avoiding carbohydrates can induce physiological insulin resistance by downregulating enzymes and metabolic machinery important for proper carb metabolism

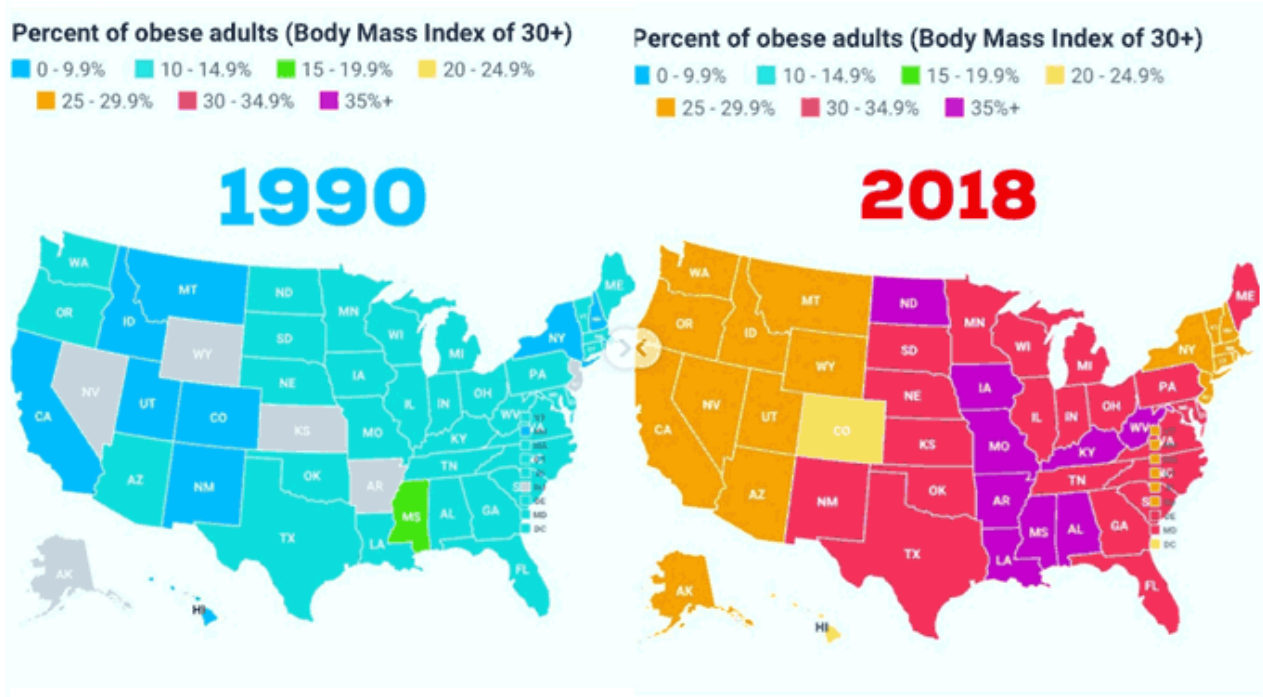
Free fatty acids play a key role in developing insulin resistance, with elevated levels preventing cells from effectively using carbohydrates

Type 2 diabetes is associated with increased total plasma free fatty acid concentrations

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In the world of health and nutrition, few topics have sparked as much debate and confusion as insulin. This hormone, essential for regulating blood sugar levels, has become the subject of countless diet trends, health theories, and heated discussions. But why is there so much confusion surrounding insulin, and what's the truth behind the hype?

I completely understand why so many are interested in the topic — as many people are not metabolically healthy. Estimates suggest that about 1 in 3 adults in the U.S. may be insulin resistant. And 2024 CDC data indicates that the obesity rate in the U.S. is around 42% to 43% among adults.



Insulin resistance is a condition where the body’s cells become less responsive to insulin, a hormone produced by the pancreas that helps regulate blood sugar levels. When insulin resistance occurs, more insulin is needed to help glucose enter the cells. Over time, this can lead to higher insulin levels in the blood and may contribute to various health issues.

Having insulin resistance is certainly not desirable and is a real problem in modern society. However, is insulin something we should fear?

The Insulin Dilemma: Why Are We So Confused?

It’s easy to see why many people feel overwhelmed when it comes to understanding insulin’s role in our bodies. On one side, we have health gurus promoting the “carbohydrate insulin model,” suggesting that insulin is the primary culprit behind weight gain and metabolic issues. On the other side, we have scientific research that paints a more nuanced picture. So, how did we get here?

The carbohydrate insulin model, promoted by figures like Dr. Jason Fung, presents a seemingly straightforward explanation for weight gain and metabolic problems. According to this model, the consumption of carbohydrates can lead to insulin spikes that promote fat storage and contribute to obesity.

1. Insulin tells your body to store calories.
2. Carbohydrates cause insulin spikes.
3. Therefore, high carbohydrate diets lead to weight gain and metabolic issues.

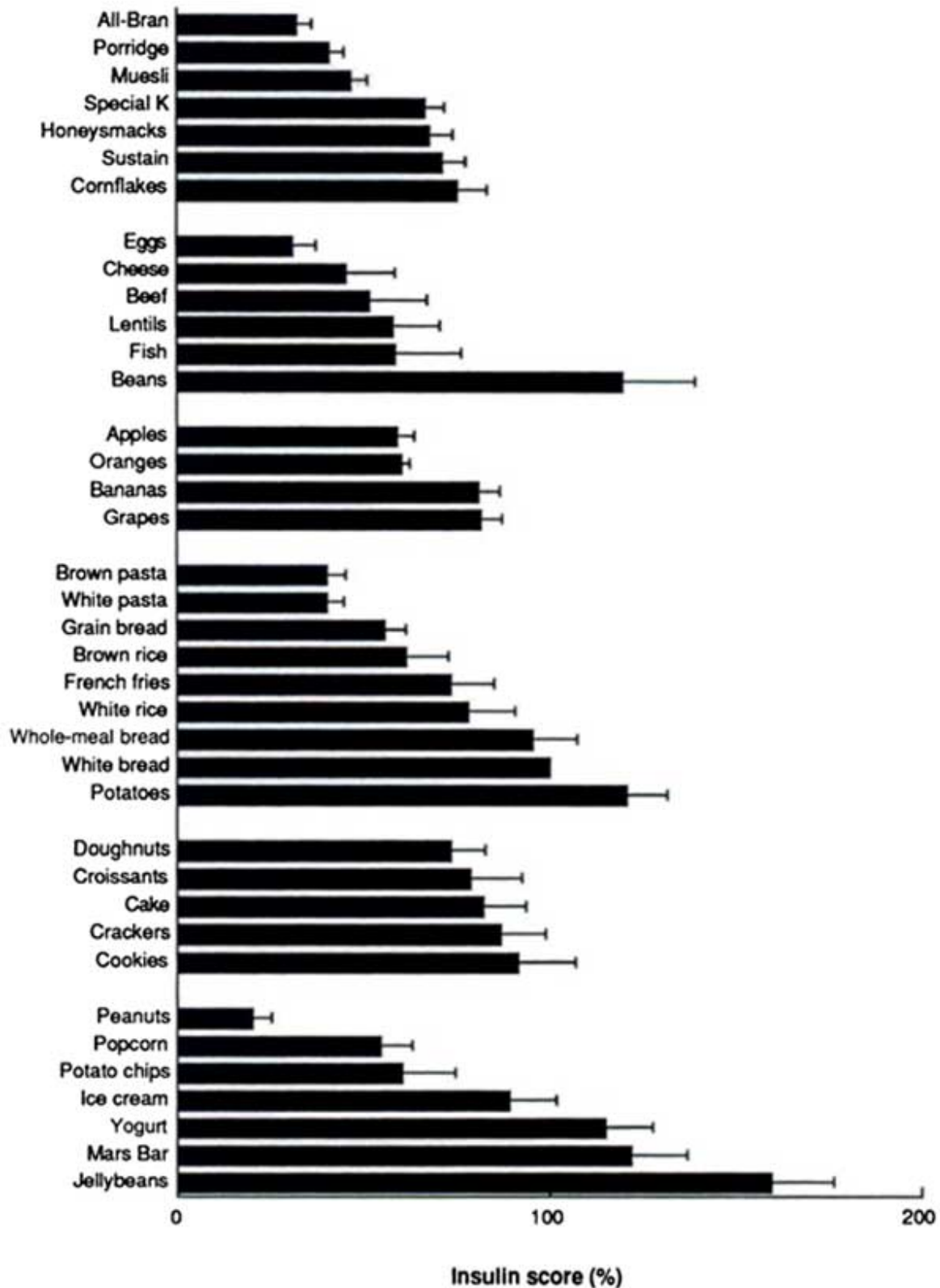
This explanation is appealing in its simplicity. It offers a clear villain (carbohydrates) and a simple solution (reduce carbs to reduce insulin). For many people struggling with weight or health issues, this model provides a sense of control and a clear path forward.

The carbohydrate insulin model then suggests that a higher protein and higher fat intake is best because it doesn’t increase insulin. It also causes many people to fear carbohydrates

and can lead to eating-disorder like behaviors for others. While a diet higher in fat may keep insulin levels lower, it doesn't fix the underlying metabolic problem (which is the inability to use carbohydrates). And when it comes to protein, did you know that protein actually spikes insulin as well?

In a study where researchers gave subjects 240-calorie servings of 38 different types of foods and measured insulin levels, they found that while higher carbohydrate foods generally caused greater insulin secretion, the results weren't as clear-cut as many would expect.¹ Surprisingly, beef caused a greater insulin release than white pasta! This finding challenges the common belief that only carbohydrates significantly impact insulin levels.

INSULIN INDEX OF FOODS



Other studies have shown that whey protein powder also stimulates the release of insulin following intake.² So, if protein-rich foods like beef and whey can stimulate insulin release, does that make them “bad” according to the insulin fear-mongering logic? Of course not! This realization helps put the insulin debate into perspective.

Reality: It's More Complicated Than That

The carbohydrate insulin model is an oversimplification of a much more complex system. Recent research has shown that the relationship between insulin, carbohydrates, and body fat is far more nuanced.

Like every other hormone in your body, insulin has a specific purpose and isn't inherently good or bad. In fact, insulin plays crucial roles in our body beyond just regulating blood sugar. Insulin facilitates glucose and amino acid uptake into muscle cells, promoting muscle growth and preventing muscle protein breakdown.

So, if insulin isn't the primary villain, what is? Again, having elevated insulin and insulin resistance is not a good thing. But what is the reason for the elevated insulin? The inability to utilize carbohydrates.

Consider this: Some bodybuilders inject significant amounts of insulin, yet remain extremely lean. On the flip side, if someone consumed large quantities of pure fat, they would gain substantial body fat despite having very little insulin increase.

Research demonstrates that obesity and inactivity are the biggest contributors to insulin resistance, not carbohydrates themselves. In fact, high-fat diets have even been shown to negatively impact insulin sensitivity. These examples illustrate that the relationship between insulin and fat gain isn't as straightforward as some would have us believe.

Carbohydrates Are Not the Enemy You Think They Are

Contrary to popular belief, high carbohydrate and sugar intakes are not associated with insulin resistance and diabetes.^{3,4,5,6,7} In fact, increasing carbohydrate consumption can actually increase insulin sensitivity.^{8,9,10,11,12}

This doesn't mean that all carbohydrates are created equal or that unlimited consumption is advisable. However, it does suggest that demonizing all carbohydrates based on their effect on insulin is misguided.

Interestingly, avoiding carbohydrates can actually induce physiological insulin resistance. How? When we drastically reduce carb intake, our bodies downregulate the enzymes and metabolic machinery important for proper carb metabolism. Additionally, elevated levels of fatty acids can interfere with insulin signaling pathways. Again, removing the trigger instead of fixing the underlying problem.

A study comparing high-fat and low-fat diets found that participants on the high-fat diet experienced a decrease in glucose disposal rates during insulin infusion, indicating reduced insulin sensitivity.¹³ There's also evidence suggesting that low-carbohydrate intake in healthy individuals of normal weight might lead to dysfunctional glucose homeostasis over time.¹⁴

One of the key players in the development of insulin resistance is often overlooked: free fatty acids. When we avoid carbs, our bodies can rely more on stress hormones like adrenaline to regulate blood sugar. This adrenaline release triggers the release of free fatty acids from our stored fat into the bloodstream.

Higher circulating free fatty acids prevent our cells from effectively using carbohydrates. As one study notes:

“Dysregulation of free fatty acid metabolism is a key event responsible for insulin resistance and Type 2 diabetes. According to the glucose-fatty acid cycle of Randle, preferential oxidation of free fatty acids over glucose plays a major role in insulin sensitivity and the metabolic disturbances of diabetes mellitus ...”¹⁵

Another study adds:

“Elevated plasma FFA levels have been shown to account for up to 50% of insulin resistance in obese patients with Type 2 diabetes mellitus. Lowering of FFAs in these patients or interfering with steps in the pathway through which FFAs cause insulin resistance could be a new and promising approach to treat Type 2 diabetes mellitus.”¹⁶

In fact, did you know that Type 2 diabetes is associated with increased total plasma free fatty acid concentrations?¹⁷ The root cause is often an alteration in oxidative phosphorylation (the process of using oxygen to produce energy from glucose — burning carbs the ‘right’ way) and an increased reliance on glycolysis (breaking down glucose without oxygen, the least efficient way).¹⁸

Oxidative phosphorylation leads to more ATP production and more CO₂. While glycolysis leads to less ATP, less CO₂, and more antimetabolic breakdown products like lactic acid.

When carbs aren’t being used efficiently to produce energy, it builds up in the cells. This excess sugar blocks more sugar from entering the cells, which prevents insulin from doing its job.¹⁹ At the heart of insulin resistance lies an inability to effectively use carbohydrates to produce energy. This impairment inhibits the function of insulin. Simply avoiding carbohydrates may reduce insulin levels, but it doesn’t fix this underlying problem — it merely removes the trigger.

The Long-Term Effects of Carb Avoidance

If you’re thriving on a low-carb diet, there’s no need to change your approach. Stick with what works for you and makes you feel your best. However, some people experience frustrations with this dietary style despite being told it is the answer to all of their problems. They may struggle to lose weight, notice thinning hair, have difficulty digesting certain foods, or face issues with sleep and digestion. (The result of poor energy production.)

For others, they may feel great at the beginning or for a few years, until their health starts to take a turn, or they re-gain their weight. It feels good, until it doesn’t. Removing carbohydrates from your diet can force your body to produce more adrenaline and cortisol to compensate, which can actually worsen carb metabolism over time.

This is why some individuals with hypothyroidism who follow a low-carb diet long-term may see their blood sugar “stabilize” initially, only to have it increase again later, regardless of how few carbohydrates they consume. (Why you see some on a low carb diet have elevated fasting glucose levels, despite eating little to no carbs.)

It’s crucial to understand that when you don’t eat carbohydrates, your body will make it

from your own tissues or dietary protein to provide for the cells that require glucose. The only way to truly solve the problem of metabolic dysfunction is to address the underlying dysfunction that causes it.

So, what's the solution? As with many aspects of health and nutrition, the answer lies in balance and individualization. Here are some strategies that can help improve insulin sensitivity and overall metabolic health:

1. Eat 3 to 4 balanced meals a day, focusing on whole, minimally processed foods

— Fasting all day in the name of 'health' is not going to improve metabolic function. On the flip side, you don't need to be snacking all day.

2. Minimize eating out and avoid heavily processed foods.

3. Exercise consistently, incorporating both strength training and cardiovascular exercise

—Remember, rest days are important too, but complete inactivity isn't the answer. Muscle mass is inversely associated with insulin resistance.²⁰ So the more muscle mass you have, the more insulin sensitive you will be. More muscle means a greater capacity to take up glucose from the bloodstream.

4. Aim for 8,000 to 10,000 steps per day to increase nonexercise activity thermogenesis (NEAT).

5. Reduce consumption of polyunsaturated fatty acids (PUFAs), which can impair proper glucose oxidation^{21,22} and potentially damage insulin-producing beta-cells in the pancreas.²³

6. Remain mindful of total dietary fat intake — Dietary fat is not 'bad', but overconsuming fat is not required to reap the hormonal and micronutrient benefits. Remember, excess fat consumption can negatively impact carb oxidation, especially when in an insulin resistant state.

7. Include animal protein sources, eggs, and dairy for B vitamins and the micronutrients required to properly oxidize carbohydrates

— It is best to choose collagen-rich cuts of meat to get a boost in beneficial amino acids like glycine, which further help your body regain metabolic function. (Example cuts would be slow cooked beef shanks, bone in roasts, beef cheeks, tendons, oxtail, pork hocks, lamb shanks, etc.)

Embracing Metabolism for Better Health

The journey to optimal health and metabolic function isn't about finding a single villain to eliminate from our diets. It's about understanding the complex interplay of various factors — including diet, exercise, stress, and sleep — and how they affect our individual bodies.

Insulin, far from being the enemy, is a crucial hormone that plays multiple important roles in our bodies. By focusing on overall metabolic health rather than demonizing specific nutrients or hormones, we can develop a more balanced, sustainable approach to nutrition and health.

Remember, if you're feeling confused or overwhelmed by conflicting health information,

you're not alone. The key is to focus on foundational healthy habits and listen to your body. If a particular approach is working for you — you feel great, have good energy levels, and maintain a healthy weight — then stick with it. But if you're still struggling, don't be afraid to reassess and try a different approach.

Ultimately, the path to health is a personal journey. By arming ourselves with accurate information and maintaining an open, curious mindset, we can navigate the complex world of nutrition and find what truly works for our individual bodies.

Transform Your Health — One Step at a Time

Ashley and her sister Sarah have put together a truly groundbreaking step-by-step course called "Rooted in Resilience." They have compiled what clearly is the best application of Dr. Ray Peat's work on Bioenergetic Medicine that I have ever seen.

It is so good that I am using the core of their program to teach the many Health Coaches that I am in the process of training for the new Mercola Health Clinics I am opening this fall. It took these women working nearly full-time on this project for a year to create it.

This has to be one of the absolute best values for health education I have ever seen. If you want to understand why you struggle with health problems and then have a clear program on how to reverse those challenges, then this is the course for you.

It is precisely the type of program I wish I would have had access to when I got out of medical school. I fumbled around for decades before I reached the conclusion they discuss in the course and share with you so you can restore your cellular energy production and recover your health.

- Select and eat the right foods to heal your metabolism and improve glucose utilization
- Balance your hormones to help reduce anxiety, weight gain and sleep disturbances
- Use reverse dieting to increase your calories without gaining weight and tanking your metabolism, all while improving your energy levels
- Heal your gut for proper immune function, mood and weight management
- Tweak your diet and lifestyle habits to improve your mindset and mental health
- Crush your fitness goals with ease and get your life back on track
- Master the most essential habits for health with bonus guides, including over 100 meal plans to take the stress out of meal time planning and shopping, and so much more!

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Ashley Armstrong is the co-founder of Angel Acres Egg Co., which specializes in low-PUFA (polyunsaturated fat) eggs that are shipped to all 50 states ([join waitlist here](#)), and [Nourish](#)

Cooperative, which ships low-PUFA pork, beef, cheese, A2 dairy and traditional sourdough to all 50 states. Waitlists will reopen shortly.

Notes

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