



WEIGHT LOSS

Mitochondria and fructose

January 2026 Extracts...

What's the difference between fasting and GLP-1s (eg Ozempic, Mounjaro)?

They both create an energy deficit and lead to weight loss — fast two days a week or skip breakfast and you've reduced your calorie intake by 33 per cent, exceeding your adaptive homeostasis. But while fasting has many metabolic benefits, GLP-1s subdue the metabolism. It's long-term undernourishment. Although there's some benefit on inflammation from insulin reduction, cells stay carb-dependent and fat-burning pathways remain inefficient. GLP-1 receptor agonists, commonly known as GLP-1s are a class of medications primarily used to treat type 2 diabetes and obesity. They mimic the action of the natural hormone glucagon-like peptide-1 (GLP-1), which is released in the small intestine.

When you fast, your body knows that food is temporarily unavailable not chronically scarce, so it doesn't panic or slow your metabolism — quite the opposite. Fasting improves insulin sensitivity, stabilises blood sugar and lowers inflammation, so you beat back oxidative stress. It keeps your fat-burning pathways shipshape and depletes carb stores so you burn fat stores for energy — not muscle. It also clears debris in the cells and initiates mitochondrial renewal, improving cell health and function. Every one of the cellular root causes of obesity and chronic disease is reversed by fasting.

Biofeedback is the new weight loss

As your body learns to switch between fat and carb burning, you'll get fewer cravings, your energy levels will stabilise and you'll feel less hunger. It will be easier not to snack, as you're no longer carb-dependent. You'll top up your energy from your fat stores. So when you fast (and fasting doesn't have to be dramatic, you might just choose to skip breakfast a couple of days a week) you're no longer ravenous. Losing weight becomes effortless. You've reached metabolic nirvana. Care for your body at a cellular level and it will look after its own weight. You won't need GLP-1s. You're free.

The five scientific reasons you're not losing weight

by Dr Paul Chell and Dr Monique Hope-Ross

1. Fat is trapped in your cells

Any excess glucose you eat, beyond what you can store in your liver and muscles, is converted to fat. Fat is stored as triglycerides in fat globules inside our fat cells. When our body needs energy, these triglycerides must be broken down into fatty

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acids. The fatty acids must then enter the mitochondria (the power plant of every cell) to be burnt for fuel. In healthy cells, triglycerides can exit the fat globule when needed. In obesity, the “unlocking” mechanism sticks so the triglycerides can’t get out. Your fat is literally locked inside your fat cells so you can’t burn it as energy. More glucose can get in though and is converted to triglycerides, so more and more fat is stored.

2. You have insulin resistance

Insulin is called “the fat-storing hormone” because when it’s in your bloodstream, you can’t burn fat. Anything in your diet or lifestyle that raises insulin levels creates this fat trap. And the higher, longer and more frequently insulin is raised, the worse it gets. Many people are in a high insulin state all day, because they’re constantly consuming carbs and sugars — it’s stealth insulin dosing. Over time, your cells become desensitised to insulin, so it’s released in bigger doses and circulates for longer just to do its job of ushering glucose out of the blood into cells. It’s another vicious cycle — you get high blood sugar that stays high for hours, increasing fat storage, reducing fat burning and making you fatigued.

3. Your mitochondrial drawbridges are up

Theoretically, your mitochondria — the power stations in cells that convert fuel into energy — can burn both carbs and fat. But fats and carbs each get into the mitochondria via their own special “drawbridge”. If your metabolism is healthy, both fat and carbs can get in. But with obesity or poor metabolic health, the fat drawbridge is raised (in scientific terms, carnitine palmitoyltransferase 1 is closed for business). Causes are high insulin, chronic inflammation and oxidative stress, which damages mitochondria, making them less efficient at burning fat. That’s right — not only can fat not escape its fat globule, it can’t get into the mitochondria. So you can only burn glucose. Hello weight gain.

4. Your fat-burning enzymes are faulty

In yet another obstacle to losing weight, the fat-burning machinery inside the mitochondria malfunctions. So even if a doughty triglyceride does make it into the cell’s power plant, the fat-burning enzymes inside are too damaged to process it. Causes include our old nemesis, high insulin. Leptin resistance is also responsible. Leptin is the satiety hormone and when resistance develops, it leads to overeating, plus it directly influences the fat-burning machinery’s ability to burn fat. Being sedentary is also a contributor as there is less demand for fat as fuel. And chronic inflammation also impairs fat burning.

5. You’re high in oxidative stress

A “redox imbalance” essentially means there’s more oxidative stress in your cells than they can overcome with antioxidants and other “reductive” forces. This chemical stress blocks fat burning and fuels inflammation. It leads to mitochondrial dysfunction, faster ageing, low energy and disease. Culprits include chronic stress, poor sleep, pollution, being sedentary and a diet high in UPFs, alcohol and sugary

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foods.

Nothing is as important as having healthy mitochondria and fit, functioning cells.

NOTES: Your body has two metabolic states — fed or fasted. Cellular repairs can't happen when you're constantly eating. It's when you're fasting that your body switches to growth, maintenance and repair of cells and tissues. Damaged mitochondria are cleared and replaced. New mitochondria are produced. Improvements in cellular health underpin the health of every bodily system, from heart and brain to liver and immune function.

Here's what else you can do to boost cellular recovery:

Drink up to three litres of water a day

If you're not drinking enough, vasopressin, a fluid balance hormone, minimises the water lost in your pee. So if you're dehydrated, your urine is darker. It should be the colour of pale straw. But vasopressin is also a fat-storing hormone. If you don't drink much water, your body thinks — thanks to its ancient brain — that you're in a drought, so it stores fat, especially belly fat (like a human camel hump). Vasopressin is triggered either by dehydration or high fructose intake. So minimise or cut out sugar-containing food and drink, all of which contains fructose — even cold-pressed apple juice: your body assumes you're feasting on autumn-ripe fruit, a signal to store belly fat for winter survival. Ideally, drink before you feel thirsty, and have two and a half to three litres of water daily.

What Is Fructose?

Fructose is sometimes called "fruit sugar" because fruit is the main source of this nutrient. But it's also found naturally in some vegetables and natural sweeteners, and it's added to a variety of packaged foods and drinks as well. Fructose is a simple sugar, or monosaccharide. It's the sweetest naturally-occurring carbohydrate, and it's one-half of the chemical composition of sucrose, or table sugar. In addition to getting fructose from fruits and vegetables, you can also find it sold as a sweetener on supermarket shelves or added to foods in the form of high-fructose corn syrup.

Its impact on your health is complicated. Unlike glucose, which is your body's preferred source of energy, most of the fructose you eat heads to the liver to be converted into glucose and used as energy or converted to fat and stored as a future energy source. That causes fructose to have less of an impact on blood sugar compared to other sources of sugar or starch.

However, fructose has the same number of calories per gram as other sugars. And when you consume it through drinks and packaged foods rather than fruits and vegetables, it counts as an added sugar. Regardless of the type, added sugar is associated with weight gain and health issues if you have more than the recommended daily amount of roughly 50 grams (g).

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On top of that, there's evidence that fructose may play a higher role in metabolic dysfunction-associated steatotic liver disease than other sugars. Scientists working with animals have linked intestinal damage caused by excess fructose consumption to increased fat deposits in the liver. Some people have a problem processing fructose, which can lead to stomach pain, gas, bloating, and diarrhea when they consume it. In rare cases, fructose intolerance is an inherited condition that shows up in childhood and causes serious illness. Fructose can also worsen symptoms for some people with irritable bowel syndrome. In these situations, it's especially important to know how much fructose you're getting from foods.

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