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Eat Carbs Last — here's why

The order in which you eat carbs affects insulin levels, and therefore how it influences body fat.



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Understanding obesity as simply calories in, calories out is not useful at all because it doesn't try to understand WHY calories in > calories out — ie. ultra processed foods, food addictions, mindless eating, depression, poor habits, lack of eating schedules. If people are addicted to food, and therefore calories in > calories out, then we need to treat the addiction, not just tell people to 'eat fewer calories'. It's 100% not useful.

It is analogous to seeing the problem of alcoholism as alcohol in, alcohol out, which is obviously true. But treating alcoholism means you much understand WHY alcohol in > alcohol out — ie. PTSD, depression, addiction. Just seeing Alcohol In, Alcohol Out leads to some bad advice like 'just drink less alcohol'. This is 100% true, but not useful in any way. You need to treat the addiction or PTSD or depression instead.

Calories in, calories out is a failed paradigm because it leads to no useful interventions or drug therapies. Drugs that simply affect calorie intake do not lead to lasting weight loss. Consider artificial sweeteners. Zero calories, so why doesn't it cure obesity? When was the last time somebody told you "Oh, I just switched to diet soda and lost 30 pounds"? Fake, zero calorie fats like Olestra didn't cure obesity and were so useless, they've largely been forgotten. Drugs like Xenical,

which blocked intestinal absorption of dietary fat, therefore reducing both fat and calories failed so miserably that it, too is just about off the market.

Why are we getting Fat? It's the Insulin, Stupid.

The Body Fat Thermometer — part 8

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Instead, it is more useful to consider body fat as being regulated homeostatically by hormones, just as a thermostat regulates room temperature. Some hormones increase body fat storage and some hormones decrease it. Hormones that decrease body fat include GLP-1, GIP, Leptin and sympathetic tone. Drugs that affect the GLP-1 hormones (like Ozempic) cause weight loss. Drugs that affect GIP (like Mounjaro) cause weight loss. Drugs that affect sympathetic tone (eg. nicotine, the infamous Fen-Phen) cause weight loss. Leptin is a weak hormone system.



There are also hormones that cause weight gain. Insulin is the most important of these, but cortisol (the stress hormone) can also do it.

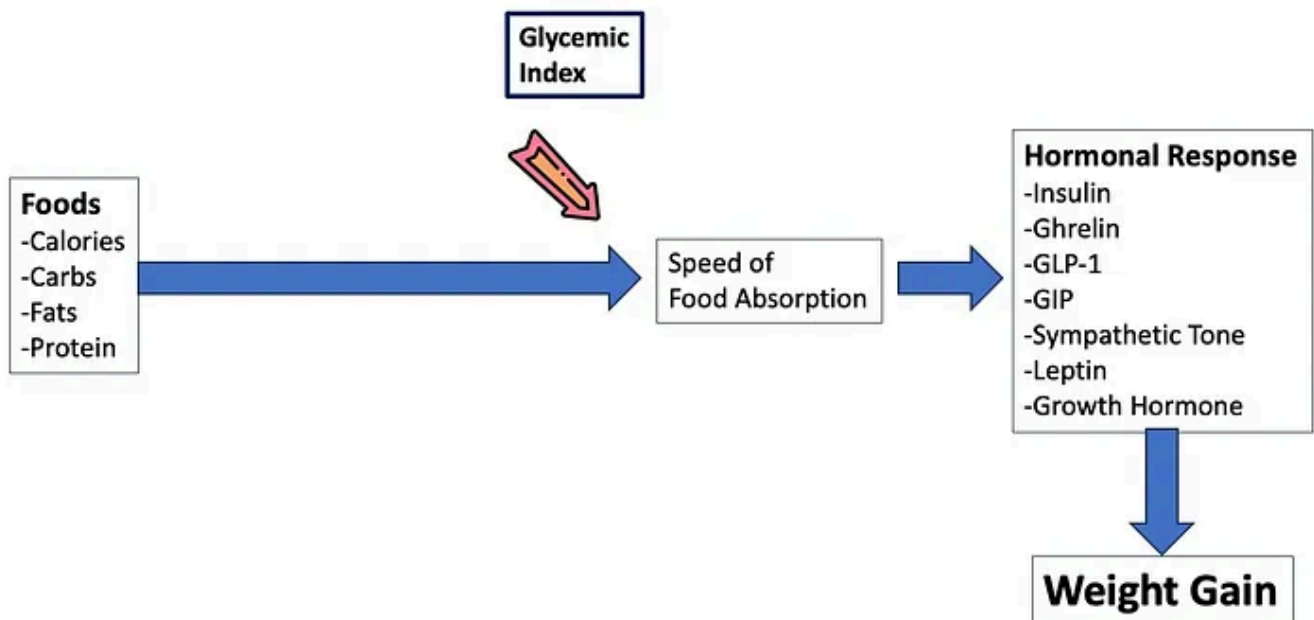
Drugs like exogenous insulin cause weight gain.

Drugs that increase insulin (sulphonylureas) cause weight gain.

Drugs that increase insulin effect (TZDs) cause weight gain.

Drugs that reduce insulin (GLP-1 agonists, SGLT-2) cause weight loss.

So, yes, insulin is an important hormonal signal to increase body fat. This is often the rationale for low carbohydrate diets. However, the number of carbohydrates is not the only factor that influences insulin, and therefore weight gain. For a given number of carbohydrates, foods can have high or low glycemic index which roughly corresponds to its insulin effect, too. There are other influences, too.



Fiber and Resistant Starches

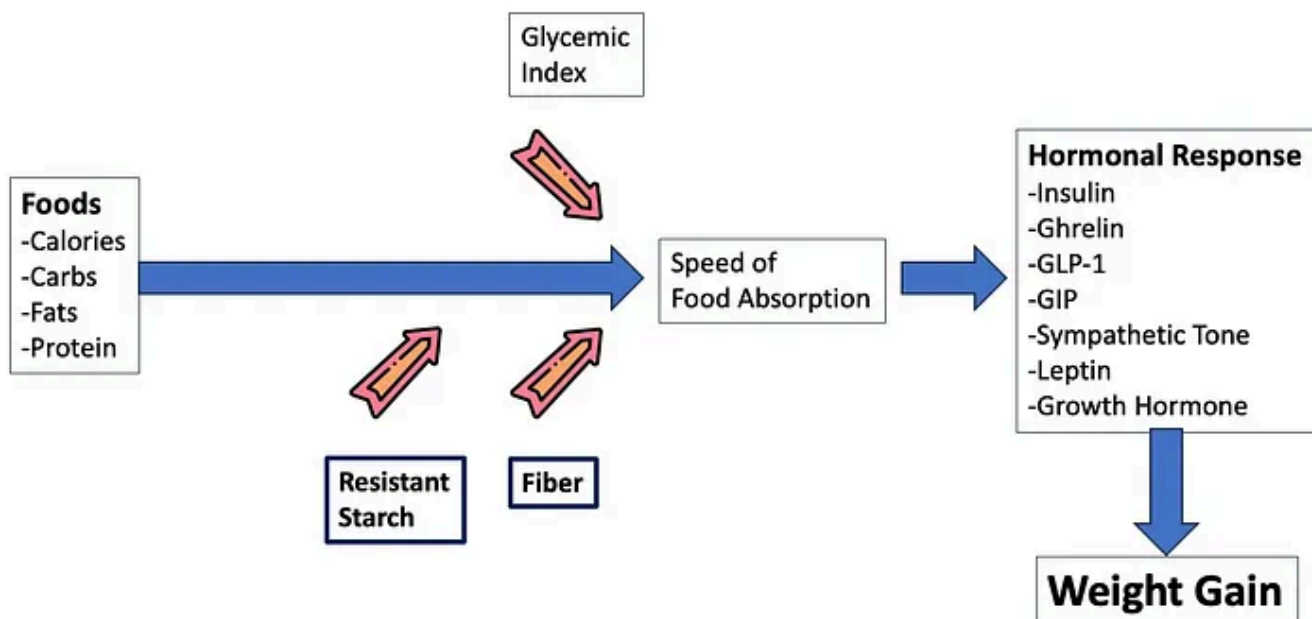
When food is absorbed faster by our intestines, glucose spikes faster, insulin spikes faster and this differential hormonal effect is enough to affect our eating

behavior. That is, eating a high glycemic index meal makes us eat more later.

In addition, there are other factors that affect speed of absorption. In The Obesity Code, I've discussed the benefits of fiber as a way to slow down absorption, acting almost as an 'antidote' to the carbs. Fiber is the part of the carbohydrate that cannot be absorbed. So it often appears in the nutrition label as carbohydrate, but if you take the total carbohydrate and subtract fiber, you get the 'net carbs', which is the only part your body can absorb.

Fiber slows down the speed of absorption and therefore reduces the glycemic index. The glucose and insulin tend to rise slower when eating fiber containing foods. Resistant starch can play a similar role (See my article — The 5 Types of Resistant Starch)

In addition to fiber and resistant starches, there are other factors, other than the number of calories or carbs that will impact speed of absorption and therefore the hormonal response and then ultimately weight gain. One of those factors is the order in which you eat your food.

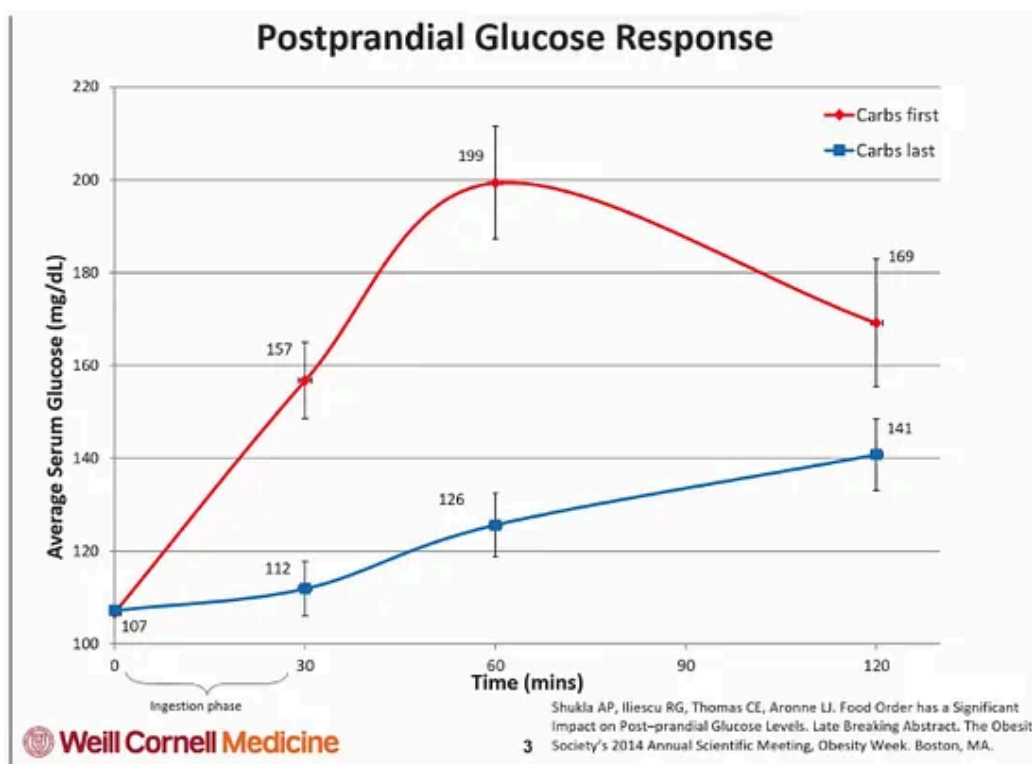


Food Order — Eat proteins & vegetables first, Carbs Last

Changing the order in which foods are eaten reduces insulin spikes. That is, eating proteins and vegetables before carbs causes less of a spike than eating the carbs first.

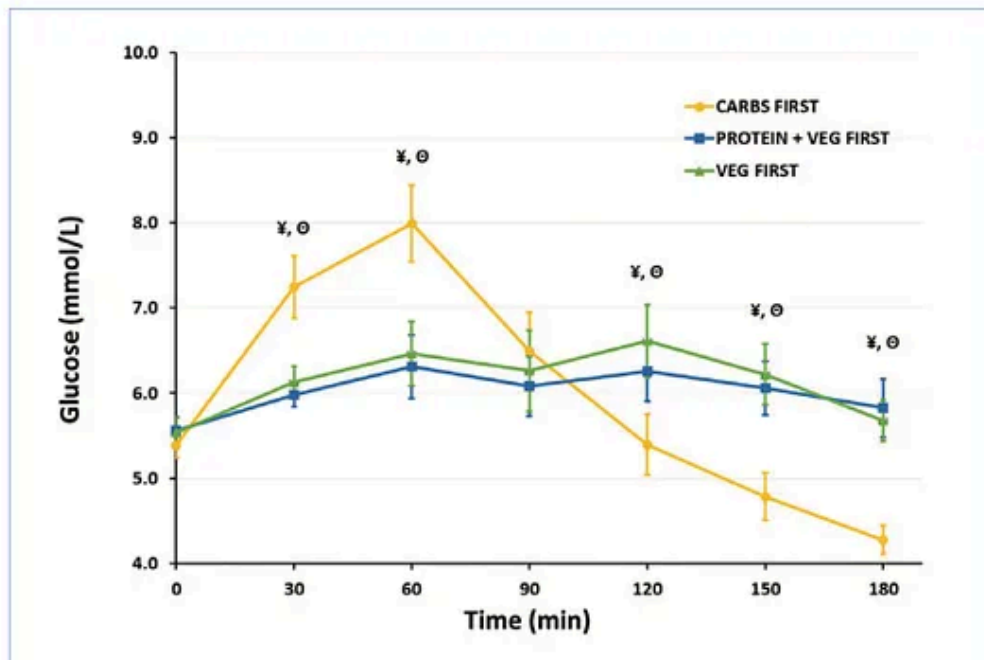
In 2015, a pilot study looked at the effect of food order in type 2 diabetic patients. Previous observations showed that eating whey protein, found in dairy products could reduce the post prandial (after meal) spike in insulin and glucose. In this study, they looked at people who ate a meal of carbs (bread and orange juice), protein (chicken breast) and vegetables (salad and steamed broccoli). The participants would either eat the carbs first and then the protein and vegetables 15 minutes later or in reverse order. Each participant would then wait a week (for washout) and then repeat the experiment so that everybody was tested with carbs first and carbs last.

The results were stunning.



At 60 minutes after the meal, the carbs last group decreased their blood glucose by 36.7% at 60 minutes and their serum insulin by 49.6% At 120 minutes, the effects were still remarkable, lowering glucose by 16.8% and insulin by 40.2%.

In their next follow up study, in 2019, researchers looked at patients with pre-diabetes. Again, each participant ate both carbs first and carbs last, 1 week apart, although this time, the carbs or proteins & vegetables were only separated by 10 minutes instead of 15. This time there were 3 groups — carbs first, protein & veg first, and veg first.

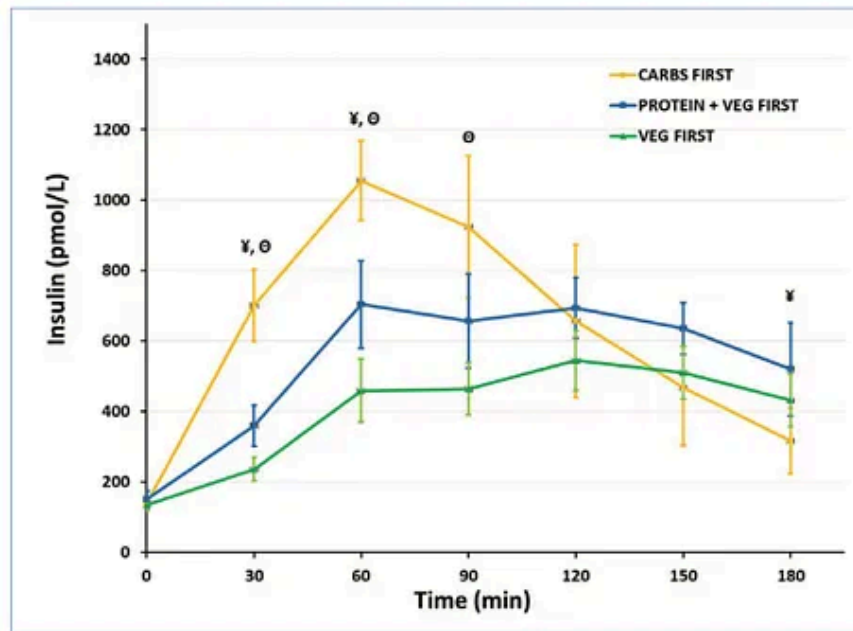


Diabetes Obes Metab. 2019;21:377–381.

The results were remarkable. Eating carbs first led to a massive spike in blood glucose with a subsequent massive drop in blood glucose. The overall effect, as measured by the Area Under the Curve (AUC) for glucose, was 38.8% lower with eating the carbs last. The variability in blood glucose is massively higher with eating the carbs first. Blood insulin levels shows the same rise with eating the

carbs first. Remember, that the meals are EXACTLY THE SAME. Only the food order changed.

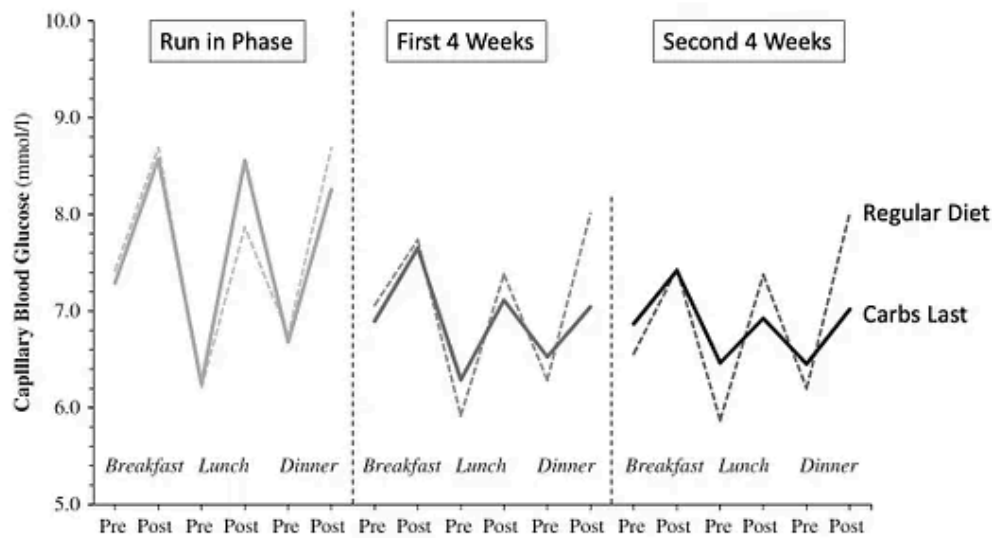
Eating the vegetable first seemed to lower insulin even more than eating protein & vegetable first, and that may be related to protein's ability to release insulin. The insulin area under the curve was 43.8% lower for the carbs last group.



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This has massive implications, for type 2 diabetes, prediabetes and weight loss. You can eat the EXACT SAME MEAL and reduce your blood glucose by about 40–50% simply by changing the order in which you eat food.

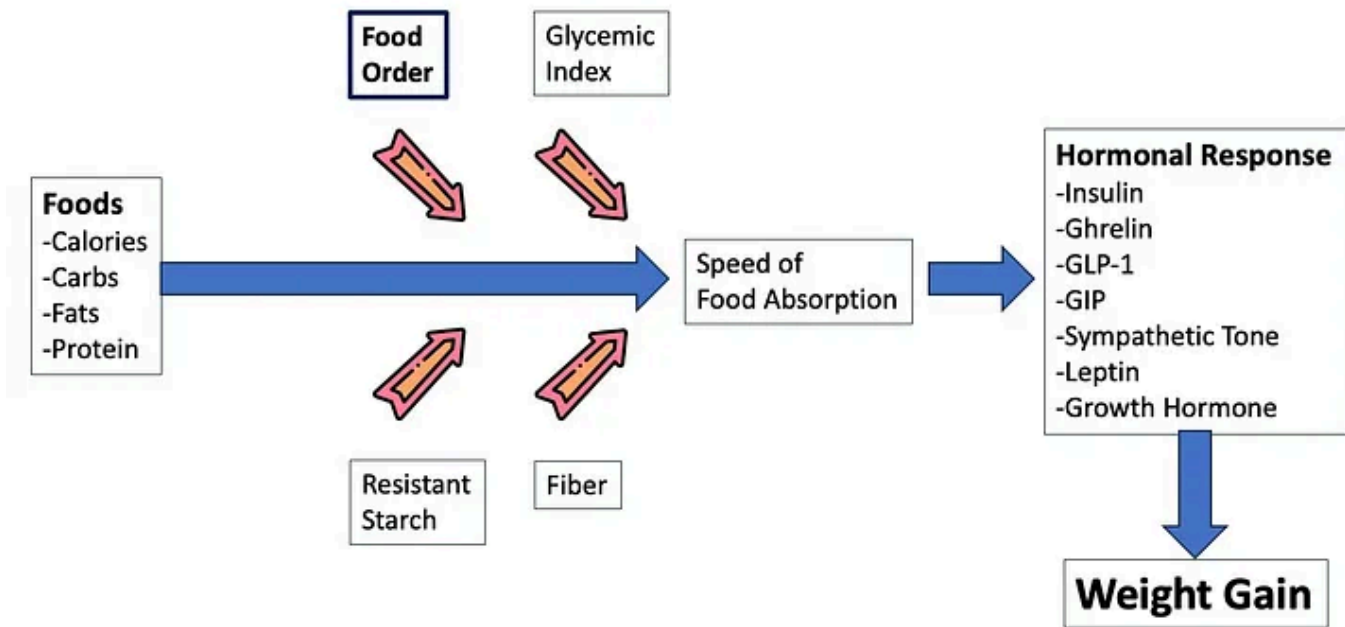
Studies over longer time frames show the same effect. In this 2016 study in ‘free-living’ conditions, changing the order of food intake reduced blood glucose. Two groups of subjects were given instructions to follow either a control diet or an experimental diet which was identical to the control diet except for instructions to eat the high carb items after the low carb items (meat, fish, eggs etc.)



Both groups lost a little weight, and there was no major difference between groups. There is a marked improvement in the blood glucose after meals, which is in accordance to previous studies. The spikes and falls in glucose are markedly attenuated, which corresponded to an improvement in the hemoglobin a1c of 0.3%. In other words, this dietary advice worked in real life for type 2 diabetes.

It's the insulin, not necessarily the carbs

It's the insulin, not the carbs that drives weight gain. And there are many things that change how much the carbs increase insulin. Changing the food order may have a large role. Practically speaking, eat the carbs last. In restaurants, you are often given bread to start. This has a double bad effect. First you are hungry and therefore tempted to eat more bread than you may otherwise. Second, this carb load will have an outsized effect on your blood glucose and blood insulin levels. Always ask for the bread to be served with or after your meal.



Practically, some ways to lower the insulin effect are:

1. Eat fewer carbohydrates
2. Eat lower glycemic index carbohydrates
3. Eat more fiber
4. Eat more resistant starches
5. Eat the proteins and vegetables first, carbs last