

Premium Fuel Required

From living to eat, to eating to live.

I am a doctor, but I am not your doctor. This is education, not medical advice. There is no single best way to live, you are your own laboratory, and your results will vary. Take what is useful, read further, and discuss it with the physician who knows you.

Nobody handed you the owner's manual for this thing when you were born. So here is the quick start guide, and this session is the intake valve, which is where most of the trouble begins. Three parts: how it works, what goes wrong, and what to do about it.

Part 1: how it works

- You are running roughly **37 trillion cells**. Some do visible work, contracting muscle or firing nerves. Most are quietly moving molecules across membranes every second of your life. All of them need energy.
- Every bit of that energy started as sunlight. Plants convert light into stored chemical energy. Animals eat plants. Some animals eat those animals. What eating actually is, stripped of ceremony, is taking energy something else already stored.
- Three storage forms arrive on your plate: **carbohydrate, protein, and fat**. Once absorbed, glucose has three destinations. Immediate use, in the blood. Short-term storage as glycogen in liver and muscle, which holds roughly a day's worth. And long-term storage as fat, which is effectively unlimited.
- Your body decides between them continuously, reading the conditions like a traffic officer: how full the short-term stores are, and how well the whole system is working. That is called fuel partitioning, and when it works you never notice it at all.

Part 2: what goes wrong

Yummy, yummy, everywhere

Two forces, and neither of them is your willpower.

The societal one. Look at the timeline of how humans have fed themselves and something changes around the 1970s and 80s. Having discovered "nutrients," we grew confident we could manufacture food better than food. Food shifted from a necessity to a commodity, and every attribute flipped with it.

Food as necessity

Scarce. Whole. Work-intensive. Expensive.
Many local producers. Whatever is in season.

Food as commodity

Abundant, around the clock. High in sugar.
Highly processed. Convenient. Cheap. A few
national producers. Whatever sells.

- The food retail industry runs to trillions of dollars, and a meaningful share of that is research aimed precisely at your vulnerabilities. You are not in a fair fight, and a passive approach loses by default.
- There is a working formula for irresistible: calorie dense, combining sugar and fat; intensely flavored; immediately delicious; easy to eat quickly; and engineered to dissolve in the mouth so you barely register having eaten. Natural selection, survival of the tastiest.
- And the effect is causal, not correlational. In a controlled feeding trial where the diets were matched for calories, sugar, fat, fiber and macronutrients, people eating the ultra-processed version ate about 500 calories a day more and gained weight. (Hall and colleagues, 2019.) They were not weaker. The food was different.
- Portions moved with it. The same restaurant meal that ran about 415 calories a generation ago now runs closer to 1,400.

The psychological one. Modern food hits the reward system hard enough to look like other things we take seriously. Rats given unlimited access to junk food showed desensitized pleasure centers, needing more for the same effect, and when switched back to ordinary chow some starved for two weeks rather than eat it. Beyond that, food is a coping mechanism for stress, boredom, anxiety and unresolved pain, which produces short relief followed by regret, which produces more eating. Willpower is not the relevant tool here.

How the breakdown actually happens

Picture glucose arriving at the door like a delivery. Knock knock, glucose. Thanks, says the body, and burns it. Knock knock. Fine, into the glycogen stores, which hold about a day. Knock knock. Those are full, so out to the warehouse as ordinary body fat. Knock knock. Now it is packing fat around the liver and pancreas, which is visceral fat and metabolic syndrome. Knock knock. Enlarge the warehouses, which is obesity. Knock knock. Everything is saturated. Now the body has to force it in with more and more insulin.

- **Insulin is a fat storage hormone.** That sentence is worth memorizing, because the corollary is that while insulin is high, your body cannot use its own fat for fuel.
- Which reframes insulin resistance entirely. The cells are not being difficult. They are full, and they have turned the receptors down because they cannot take any more. Blaming the cell is like blaming a suitcase for its inability to accept more shirts.
- That is why type 2 diabetes is more accurately described as the inability to respond to insulin *after prolonged excess consumption*. Nobody wakes up with it. It is the end of a process that ran for a decade or two.
- **Metabolic syndrome** is the stage before, and it is diagnosed on three of five markers. Roughly half of Americans over 60 have it, and most of them do not know.
- Then the downstream damage. High blood glucose injures blood vessels everywhere they run: heart, brain, kidneys, retina, nerves, extremities. And there is growing evidence it accelerates cancer, which is why we can image tumors by tracking where glucose goes.
- The part that hides it is that none of this is visible from outside. Visceral fat sits around the organs, quietly compromising them, in people who look fine. Beauty is skin deep, said Jean Kerr, and that is deep enough; what do you want, an adorable pancreas? Yes, actually.

Part 3: ways to try to fix it

Step 1. Get the psychology right. It is not too late and the body is remarkably restorative. If food is functioning as soothing or escape, or if there is guilt attached, that is the thing to address first, and sometimes with help. Keep the focus on what you want rather than on shame. Progress does not require perfection: 90 percent consistency is extraordinary, 50 to 80 percent produces profound outcomes, and even 10 to 49 percent is meaningful movement.

Step 2. Get convinced. You already know you should eat better. You do not do it. The reason is not information, it is that you are not persuaded at the level where behavior actually lives. Nobody sustains a change they are performing for a doctor or for a photograph. What lasts is identity: this is who I am, this is what I do, and I do it for me.

Step 3. Know the score. Five numbers, and if any three are on the wrong side you meet the definition of metabolic syndrome. Waist-to-height ratio above 0.5, meaning your waist is more than half your height. Triglycerides above 150 mg/dL. HDL below 40 for men or 50 for women. Blood pressure above 130 over 85. Fasting blood sugar above 100 mg/dL.

Step 4. Set an objective. Most food advice conflicts because people are at different points aiming at different things. Reversing diabetes and organ damage is a different job from reversing metabolic syndrome, which is different again from maintaining metabolic wellness or pursuing optimal health. There is also a failure mode at the far end, where the pursuit becomes its own disorder.

Step 5. Make a plan. A goal without one is a wish.

- **Build meals from protein.** Roughly 0.8 to 1.0 grams per pound of ideal body weight per day, 30 to 50 grams per meal. It increases satiety, costs energy to digest, and it fights the age-related resistance to building muscle that quietly takes strength away after fifty. From animals: eggs, dairy, fish, poultry, lean beef. From plants: lentils, chickpeas, quinoa, black beans, almonds, oats.
- Muscle also matters as an organ, not just for strength. It is a major site of glucose disposal, so losing it removes one of the places the surplus was going.
- **Remove ultra-processed food and added sugar,** and get back to whole food. Read labels for added sugar and notice how often it is the second ingredient.
- **Consider a break from eating.** A fasted state begins around twelve hours, once there is no ready glucose left. Every other animal handles feast and famine, and the machinery for switching fuel is exactly what fat is for.
- **If disease is already established, the medications are real.** GLP-1 receptor agonists have changed what is possible for people with significant metabolic disease. That is a conversation with your own physician, not a decision to make from a handout.

TRY THIS

- Get the five numbers. Most come from a standard blood panel and a tape measure.
- Read the label on three things in your kitchen and find the added sugar.
- Build tomorrow's breakfast around 30 grams of protein.
- Pick one ultra-processed item and stop buying it, rather than resisting it.
- Share a portion the next time you eat out.

It is not your fault. It is a fifty-year change in the food supply that you were never consulted about. But the response is still yours to make, and going with the flow has a known destination.

Resources

The five metabolic numbers

- Waist-to-height ratio under 0.5
- Triglycerides under 150 mg/dL
- HDL over 40 (men), over 50 (women)
- Blood pressure under 130 over 85
- Fasting glucose under 100 mg/dL
- Three of five on the wrong side is the diagnosis

Fueling tips, in plain order

- Transition toward real food rather than eliminating things by name.
- Start reading labels for added sugar.
- Limit how much processed food comes into the house at all.
- Share portions when eating out.
- Do not drink your calories.
- Do not over-fill.

Referenced in this session

- Hall and colleagues, *Cell Metabolism*, 2019. The controlled trial showing ultra-processed food causes overeating.
- Jean Kerr, on the adorable pancreas.
- Scripps Research Institute, 2010, on reward desensitization in rats.

Reading and watching

- *In Defense of Food*, Michael Pollan. What happened to the food supply, and the seven-word answer.
- *Why We Get Sick*, Benjamin Bikman. Insulin resistance as the common root, written for a general reader.
- *The Obesity Code*, Jason Fung. The hormonal argument, and the case for fasting.
- *Outlive*, Peter Attia. The longest and most complete of these, and the one to read if you only read one.

Theme: health. From my course *The Human Body*. The companion sessions are on movement, sleep, and what breakdown looks like from the inside.