

Chapter 1: The Flashlight in Your Teeth

The moment the freezer goes quiet

You don't wake up because of a noise. You wake up because a noise stopped.

The chest freezer in my garage has a hum I stopped hearing years ago, the way you stop hearing a clock. At 2:14 on a February morning it went silent, and my eyes opened before I understood why. No furnace. No hallway nightlight. Just the sound of sleet on the siding and my own breathing.

I went out with the flashlight in my teeth because both hands were busy, one on the railing and one on the phone that wasn't loading anything. The power station I'd bought eighteen months earlier sat on the shelf where I left it, screen dark, refusing to take the load. I pushed the button four times. That was the whole transaction: seven hundred dollars, one button, four pushes, nothing.

Here's what I want you to understand right now, before anything else in this book. **The freezer going quiet is not the emergency. The emergency is that you have no idea how long you have.** Standing in that garage, I could not have told you whether I had two hours or two days. I didn't know what my freezer drew. I didn't know what my box could actually deliver. I owned equipment and I owned meat, and I owned exactly zero numbers connecting the two.

That gap between owning gear and owning numbers is what sold me a box that failed, and it is the only thing this book is trying to close.

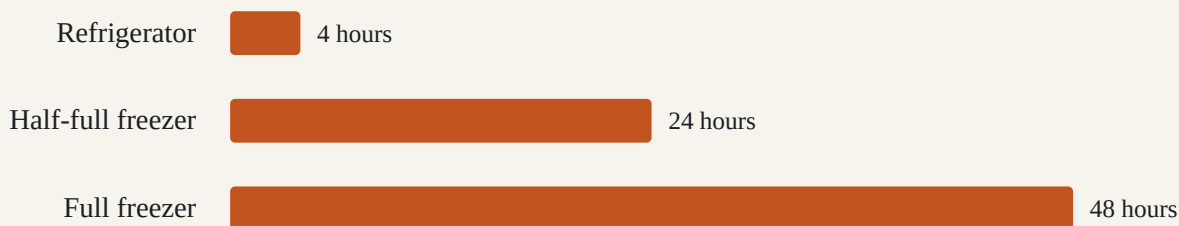
US electricity customers averaged about **11 hours without power in 2024**, roughly double the annual average of the preceding decade and the worst year in ten³⁶.

What four hundred dollars of meat actually costs to replace

Open the lid and start counting. In our house that February it was most of a hog, a quarter of a beef from a neighbor's place, two deer processed in October, and the bagged vegetables my wife put up in August. Call it four hundred dollars at what we paid. Call it seven hundred at what it would cost to buy back at retail, plus the processing fees, plus a hunting season you cannot repurchase at any price.

The federal guidance is blunt and it is worth memorizing before you need it. An unopened refrigerator holds safe temperature for about **4 hours**. A **full** freezer holds for about **48 hours**. A freezer that is only **half full** holds for about **24 hours** (U.S. Food and Drug Administration, 2025-01; USDA Food Safety and Inspection Service, 2025-01).

How long cold holds with the door shut



How long cold holds with the door shut

Notice what that half-full line does to a man who just ate through his winter meat. A freezer you've been drawing down all season is the one most likely to fail you, and it fails at exactly half the hours. We'll take that apart properly in Chapter 8, because the physics behind it is also the cheapest trick in this book.

The other number is the one that costs money. Perishable food held above **40°F for 2 hours or more** should be thrown out, and **1 hour** if the room is above 90°F. You do not taste it to decide. Ever (FoodSafety.gov, 2025-01; CDC, 2024-11).

“

"If the power was out for no more than 4 hours, refrigerated food should be safe as long as the doors were kept closed." — U.S. Food and Drug Administration

Read that sentence again and find the condition hiding in it. *As long as the doors were kept closed.* Every time you open the lid with a flashlight to see whether things are still frozen, you spend hours you cannot get back. You need a thermometer inside the box, readable through a lid opened once, not a hand you stick in to feel around.



Why this book refuses to sell you a box

Here is the pattern I watched happen to myself, and then watched happen to half the men on my road.

The outage scares you. You go online. You find a number printed enormous on the front of a box, something like 2000W, and a runtime chart showing a cartoon refrigerator running for many comfortable hours. You spend real money. The box goes on a shelf. Then, at some hour when the stores are shut and your phone is at 12 percent, the box does not do the thing the chart promised.

The community that actually measures this stuff has been saying so for years. On the DIY Solar Power Forum, one member reported watching his refrigerator pull roughly **170 amps from the battery for about a second** at compressor start. His running load was trivial. The surge was not, and surge is what trips a protection circuit and drops your load at 2 a.m. In a dedicated thread on that same forum asking whether an all-in-one power station can handle fridge startup reliably, owners converge on the same conclusion: **surge headroom, not watt-hours, is the failure point on cheap units.**

And on the capacity side, the shortfall is just as ordinary. Real-world testing puts a fridge at roughly **7 hours of operation per 1,000 Wh** of lithium power-station capacity, with about 14 hours from a 2,048 Wh unit²⁶. Then inverter losses, standby drain, and repeated compressor surges shave another **15 to 25 percent** off whatever arithmetic you did on the back of the receipt³².

The sticker sells you a number the machine can produce for one second. You need a number the machine can produce for forty-eight hours. Those are different machines, and nobody prints the second number on the front.

So I am not going to recommend a brand. I am not going to hand you a link. What I am going to do, starting in Chapter 6, is put a twenty-dollar meter in your hand and have you generate your own numbers, for your own appliance, in your own garage, at your own ambient temperature. Once you own those, nobody on this earth can sell you anything again by pointing at a sticker.

The one promise on the table

Here is the whole promise, and it is narrower than what most books offer, which is exactly why it holds.

By the end of this book you will be able to keep the food in your refrigerator and your chest freezer safe through a multi-day outage, using measured numbers, cheap parts, and equipment that mostly already exists in your house. Not your whole house. Not your well, your heat, and your television simultaneously. Your food.

That narrowness is not modesty, it's arithmetic. That same forum reported a 300Ah 12V lithium battery with a 2,000W pure sine inverter running a **freezer alone for about 3.5 days**, but running a **fridge and freezer together for only about a day and a half**. Adding one cold appliance cut the autonomy by more than half. Budget-minded members asking for the cheapest setup that will run just a refrigerator get the same answer every time: strip the load down to one appliance instead of backing up the house.

And the planning target itself comes from the same crowd. Members repeatedly warn that refrigerators are battery killers and recommend sizing for **2 to 3 days of autonomy**, because the days after a big storm are typically overcast, and solar recharge underperforms precisely when you need it most.

- ✓ **Tonight:** put a cheap dial thermometer inside your fridge and another inside your chest freezer. Write down what each reads at a normal hour.
- ✓ **Tonight:** count what's in the chest freezer and write the dollar figure on a piece of tape stuck to the lid. That number is your budget ceiling.
- ✓ **This week:** check whether your freezer is more than half full. If it isn't, you're on the 24-hour clock, not the 48-hour clock.
- ✓ **Never:** taste food to judge whether it's safe. Above 40°F for 2 hours means it goes in the trash.
- ✓ **Decide now:** your design target is food, not comfort. Write that on the same piece of tape.

You have a dollar figure and two thermometers. What you still don't have is the reason your last box lied to you, and it wasn't a defect. It was printed on the front, legally, in the largest type on the package.