

HEALTH MASTERY TOOLKIT

*The Engineer's Blueprint for
Body Recomposition*

01

The Metabolism & Thermodynamics Cheat Sheet

**Understanding Your
Biological Engine**

**SCIENCE-BACKED**

Evidence-based principles explained simply.

**PRACTICAL & ACTIONABLE**

Tools you can apply immediately for real results.

**EFFICIENT & SUSTAINABLE**

High ROI strategies for training, nutrition and recovery.

**ENGINEERED FOR YOU**

Understand the why, so you can make the right choices.

**LIFETIME BENEFITS**

Build identity-based habits that last a lifetime.

**ENERGY IN****ENERGY OUT****CALORIE
DEFICIT**

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The Metabolism & Thermodynamics Cheat Sheet

Understanding Your Biological Engine

DISCLAIMER I am an engineer and a data-enthusiast, not a doctor or a certified professional. This toolkit represents my personal research and journey. Always consult your GP before changing your diet, exercise, or medication routine.

Intro

Forget the fad diets. Human biology cannot break the laws of physics. Today, we strip away the marketing and look at the absolute first principle of body recomposition: **Energy Balance**.

The Core Concept: The First Law of Thermodynamics

Weight loss is purely a game of thermodynamics: **Energy In** vs. **Energy Out**.

If you input more energy (food) than your biological engine burns, you store it as glycogen or fat. If you input less, your body is forced to burn its stored fat to keep the lights on. Every diet (Keto, Fasting, Vegan) only works if it successfully tricks you into this state, known as a **Caloric Deficit**.

The 4 Slices of Your Metabolism (TDEE)

Your Total Daily Energy Expenditure (**TDEE**) is made of four specific parts:

	Component	Approx.	What it means
BMR	Basal Metabolic Rate	~65%	The energy required to keep your brain firing and heart beating if you were in a coma. Muscle is metabolically active; more muscle equals a higher BMR.
NEAT	Non-Exercise Activity	~15%	The sneaky calorie burner. Pacing, fidgeting, and standing.
TEF	Thermic Effect of Food	~10%	Digesting food costs energy. Digesting fat burns almost nothing, but digesting PROTEIN burns up to 30% of its own calories just to break it down!
EAT	Exercise Activity	~5–10%	Your actual time in the gym. Notice how small this is? You cannot out-train a bad diet.

Outro

Metabolism isn't a single switch; it is a mathematical equation. By managing your "**Energy In**" and understanding how your body spends its "**Energy Out**," you are in total control.

At a Glance

1 KEY TAKEAWAYS

- Fat loss is dictated by a **Calorie Deficit**.
- Your daily movement outside the gym (**NEAT**) burns vastly more calories than your actual gym workout (**EAT**).
- Protein is the ultimate macronutrient because it protects muscle and burns calories during digestion (**TEF**).

3 WHAT IS STILL DEBATED IN SCIENCE

- Scientists still debate exactly how aggressively **NEAT** drops when we diet. Some people's nervous systems shut down movement heavily in a deficit, making weight loss feel much harder.

2 COMMON MYTHS

- Myth: "Eating under 1,200 calories puts you in starvation mode and creates fat."
- Reality: "**Starvation mode**" creating fat is physically impossible. You hit plateaus because a lighter body burns fewer calories, and your body subconsciously reduces your **NEAT** to save energy.

4 PRACTICAL ACTIONS

- **Digital App Strategy:** Use a custom app to track your intake. Do not eat back the calories your treadmill says you burned—machines overestimate burn by up to **90%**!