

# METABOLIC RESET

Biohack Your Metabolism



## Roadmap

### Learning Objectives

- **Understand metabolic processes** and their role in energy production.
- **Explore biohacking techniques** for metabolic optimization, including fasting, thermogenesis, and targeted supplementation.
- **Apply dietary and lifestyle modifications** to enhance mitochondrial function and metabolic rate.
- **Critically evaluate scientific research** on metabolic biohacking strategies.
- **Use wearable technology and biometrics** to track and enhance metabolism.
- **Develop personalized metabolic biohacking protocols** based on genetic, lifestyle, and environmental factors.

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# Introduction to Metabolism

## Anabolism vs. Catabolism



### Key Takeaway:

Metabolism balances anabolism and catabolism to maintain energy and bodily functions.

### What is Metabolism?

- Metabolism refers to **all chemical reactions** in the body that sustain life.
- It is divided into **two major processes**:
  - **Anabolism (Building Up)**
    - Synthesizes complex molecules (e.g., proteins, lipids).
    - Requires energy (ATP).
    - Examples: Muscle growth, DNA replication.
  - **Catabolism (Breaking Down)**
    - Breaks down complex molecules into simpler ones.
    - Releases energy (ATP production).
    - Examples: Digestion, cellular respiration.





## Metabolic Reset

# Role of ATP Production in Metabolism

### What is ATP?

- **Adenosine Triphosphate (ATP)** is the **energy currency** of cells.
- **ATP Production Pathways:**
  - a. **Glycolysis (Anaerobic)**
    - Occurs in the cytoplasm.
    - Breaks down glucose into pyruvate.
    - Produces **2 ATP** molecules.
  - b. **Krebs Cycle (Aerobic)**
    - Occurs in mitochondria.
    - Generates high-energy electron carriers.
  - c. **Electron Transport Chain (Aerobic)**
    - Produces most ATP (**~32-34 ATP molecules per glucose**).
    - Requires oxygen.



### Key Takeaway:

ATP fuels all bodily functions; its efficiency determines **metabolic rate**

# Macronutrient Metabolism – Carbohydrates, Fats, Proteins



How the Body Uses Macronutrients for Energy

Macronutrient	Primary Function	Metabolic Pathway
Carbohydrates	Quick energy	Glycolysis → Krebs Cycle
Fats (Lipids)	Long-term energy storage	Beta-Oxidation → ATP
Proteins	Tissue repair & energy (if needed)	Amino Acid Catabolism





# Macronutrient Metabolism – Carbohydrates, Fats, Proteins



## Which One is More Efficient?

- **Fats provide the most energy** (9 kcal/g) vs. carbs & proteins (4 kcal/g).
- The body prefers **carbs first, fats second, and proteins last** for energy.

## Key Takeaway:

Each macronutrient contributes differently to metabolism, with **fats offering the highest energy yield.**





# Factors Affecting Basal Metabolic Rate (BMR)



## Key Takeaway:

**Muscle mass and thyroid hormones** play a critical role in maintaining a high BMR.

## What is BMR?

- **BMR = Calories burned at rest** for vital functions (breathing, circulation, cell repair).
- Accounts for **60-75%** of total daily energy expenditure.

## Factors Influencing BMR:

1. **Age** – BMR decreases with age due to muscle loss.
2. **Muscle Mass** – More muscle = higher BMR.
3. **Genetics** – Some individuals have a naturally higher metabolism.
4. **Hormones** – Thyroid hormones regulate metabolic rate.
5. **Diet & Thermogenesis** – Protein digestion increases metabolism.
6. **Environmental Temperature** – Cold exposure can **increase** BMR (thermogenesis).





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# Metabolic Flexibility and Adaptation

### What is Metabolic Flexibility?

- The **ability to switch between fuel sources** (carbs vs. fats) based on availability.
- **Highly flexible metabolism** = better energy efficiency & fat burning.

### How Does the Body Adapt?

- **High-carb diet** → Reliance on glucose, lower fat oxidation.
- **Low-carb/keto diet** → Increases fat oxidation (ketosis).
- **Fasting** → Enhances metabolic flexibility by improving mitochondrial function.
- **Exercise** → Improves the ability to burn both carbs & fats efficiently.



### Key Takeaway:

A flexible metabolism improves **energy efficiency, endurance, and fat utilization.**



# NUTRITION-BASED BIOHACKING FOR METABOLISM





# The Impact of Low-Carb and Ketogenic Diets on Metabolism



## Key Takeaway:

Switching to a low-carb or ketogenic diet can boost fat metabolism, improve insulin function, and enhance cognitive performance.

## What Happens When You Reduce Carbs?

- Low-carb and ketogenic diets shift the body from using glucose to using fat as the primary fuel.
- **Ketosis**: A metabolic state where the liver produces **ketones** from fat for energy.
- Insulin levels drop, promoting fat burning and reducing fat storage.

## Metabolic Benefits of Keto & Low-Carb Diets

- Increases fat oxidation and weight loss
- Improves insulin sensitivity and blood sugar control
- Enhances brain function due to ketone fuel
- Reduces inflammation and oxidative stress



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# Drawbacks of the Ketogenic Diet

### Why Keto May Not Be Sustainable for Everyone

#### Short-Term Side Effects ("Keto Flu")

- Fatigue, dizziness, headaches, nausea as the body adapts to low carbs.
- Dehydration and electrolyte imbalances due to water loss.

#### Nutrient Deficiencies

- Restricts fiber-rich fruits, whole grains, and some vegetables, leading to vitamin and mineral deficiencies.
- Lower intake of potassium, magnesium, and B vitamins.

#### Potential Long-Term Risks

- Increased LDL ("bad") cholesterol in some individuals.
- Digestive issues like constipation due to low fiber intake.
- Loss of muscle mass if protein intake is too low.

#### Hormonal Imbalances

- Potential menstrual irregularities in women due to drastic carb restriction.
- Possible stress on thyroid function, slowing metabolism over time.

#### Sustainability Challenges

- Socially restrictive and difficult to maintain long-term.
- Risk of disordered eating patterns due to extreme carb avoidance.





# A Healthier Alternative – Balanced Whole-Food Approach



**The Best of Both Worlds: Metabolic Benefits Without the Risks**

**The Mediterranean-Inspired Low-Carb Approach**

- **Moderate Carbs from Whole Foods:** Whole grains, fruits, and starchy vegetables for steady energy.
- **Healthy Fats:** Avocados, nuts, seeds, and olive oil instead of excessive saturated fats.
- **Adequate Protein:** Lean meats, fish, eggs, and plant-based proteins to support muscle health.
- **High Fiber:** Legumes, non-starchy vegetables, and fermented foods to support gut health.





# A Healthier Alternative – Balanced Whole-Food Approach

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## Key Benefits of a Balanced Low-Carb Diet

- Promotes fat loss while maintaining muscle and metabolism.
- Supports gut health with fiber-rich foods.
- Enhances brain function with omega-3s and healthy fats.
- Reduces inflammation while ensuring essential nutrient intake.

## Key Takeaway:

A balanced low-carb approach offers the metabolic benefits of keto without extreme restrictions, making it more sustainable and nourishing for long-term health.

# Comparing Dietary Approaches

## Which One is Right for You?

Finding the Right Balance for Your Body & Lifestyle

Diet Type	Carb Intake	Fat Intake	Protein Intake	Key Features	Pros	Cons
Ketogenic Diet	5-10% (Very Low)	70-80% (High)	15-25% (Moderate)	Forces ketosis, relies on fat for fuel	Rapid fat loss, improved insulin sensitivity, enhanced brain function	Nutrient deficiencies, restrictive, potential long-term health risks
Balanced Low-Carb	20-40% (Moderate)	30-50% (Moderate)	25-35% (Moderate-High)	Whole-food focus, flexible carb intake	Sustainable, supports gut health, anti-inflammatory	May require carb control for insulin resistance
Mediterranean Diet	35-50% (Moderate-High)	30-40% (Moderate)	15-25% (Moderate)	Rich in healthy fats, fiber, and lean proteins	Heart-healthy, anti-inflammatory, supports longevity	Slower weight loss compared to keto
Paleo Diet	15-30% (Low-Moderate)	40-50% (Moderate-High)	20-35% (Moderate-High)	Emphasizes whole, unprocessed foods	Eliminates processed foods, rich in protein & fats	Restricts grains & legumes, harder for some to sustain

**Key Takeaway:** The best diet is the one that aligns with your health goals, lifestyle, and personal food preferences.



# Designing a Balanced Low-Carb Meal Plan



**Key Takeaway:** A balanced low-carb approach allows for flexibility, nourishment, and sustainable weight loss while supporting metabolic health.

## How to Get the Benefits of Low-Carb Without the Drawbacks

### Ideal Macronutrient Breakdown

- Carbs: 20-40% (from whole grains, legumes, fruits, and vegetables)
- Fats: 30-50% (from healthy sources like olive oil, nuts, seeds, and avocados)
- Protein: 25-35% (from lean meats, fish, eggs, and plant proteins)

### Example Balanced Low-Carb Meal Plan

- **Breakfast:** Greek yogurt with berries, nuts, and chia seeds
- **Lunch:** Grilled salmon with quinoa, roasted vegetables, and olive oil
- **Dinner:** Grass-fed beef with sautéed greens and mashed cauliflower
- **Snacks:** Hummus with cucumber slices, mixed nuts, or dark chocolate





## Metabolic Reset

# Optimizing Metabolism for Long-Term Success



## Beyond Diet: Lifestyle Factors That Enhance Metabolic Health

- Strength Training & Exercise – Helps maintain muscle mass and supports insulin sensitivity.
- Intermittent Fasting (if appropriate) – Can complement a balanced low-carb diet for improved fat metabolism.
- Stress Management – Chronic stress increases cortisol, leading to fat storage and cravings.
- Quality Sleep – Poor sleep disrupts hormones that regulate hunger and metabolism.
- Hydration – Proper water intake supports digestion, detoxification, and cellular function.

**Key Takeaway:** True metabolic health comes from a holistic approach—not just diet, but movement, stress management, sleep, and hydration.



# What's the Best Long-Term Approach?



## Building a Sustainable Nutrition Plan

- Avoid Extreme Dieting: Keto can work short-term, but restrictive diets are rarely sustainable.
- Prioritize Nutrient-Dense Foods: Focus on whole, minimally processed foods.
- Listen to Your Body: Some people thrive on lower carbs, while others need more for energy.
- Find a Plan You Can Stick With: Consistency matters more than perfection.

**Final Thought:** Instead of chasing quick fixes, focus on a diet and lifestyle that you can maintain for life—one that fuels your body, mind, and long-term health.



# Intermittent Fasting (IF) and Its Effects on Metabolic Pathways



## Key Takeaway:

Intermittent fasting helps optimize energy production, burn fat efficiently, and improve cellular repair.

## What is Intermittent Fasting (IF)?

- An eating pattern that cycles between eating and fasting periods.
- Popular IF methods:
  - 16/8 (Fast for 16 hours, eat within 8 hours)
  - 5:2 Diet (Eat normally for 5 days, restrict calories for 2 days)
  - OMAD (One Meal a Day)

## How IF Boosts Metabolism

- Triggers autophagy – Cleans up damaged cells for better function.
- Enhances fat burning – Low insulin levels promote lipolysis (fat breakdown).
- Improves mitochondrial health – Increases energy efficiency.
- Supports hormone balance – Boosts human growth hormone (HGH) and insulin sensitivity.





# Nutrient Timing and Calorie Cycling for Metabolic Efficiency



## What is Nutrient Timing?

- The strategic intake of nutrients at specific times for optimal performance and metabolism.
- Example:
  - Carbs before a workout → Energy boost
  - Protein post-workout → Muscle recovery

## What is Calorie Cycling?

- Alternating between high-calorie and low-calorie days to prevent metabolic slowdown.
- Refeeds (High-Calorie Days): Boosts leptin levels to prevent metabolism from slowing.
- Low-Calorie Days: Improves insulin sensitivity and fat loss.



## Metabolic Reset

# Nutrient Timing and Calorie Cycling for Metabolic Efficiency



## Benefits

- Prevents metabolic adaptation (avoids "starvation mode")
- Enhances muscle growth and fat loss balance
- Supports sustained energy levels

### Key Takeaway:

Timing meals and cycling calories enhances metabolic function and fat-burning efficiency.



Metabolic Reset

Foods That Enhance Metabolism

Thermogenic and Metabolism-Boosting Foods

Certain foods naturally increase calorie burn and boost metabolic rate.

Food	Metabolic Benefit
Green Tea	Increases fat oxidation, contains EGCG
Cayenne Pepper	Activates thermogenesis, burns calories
Protein-Rich Foods	Higher thermic effect (burns more calories to digest)
Coffee & Caffeine	Increases adrenaline and fat burning
Apple Cider Vinegar	Helps with blood sugar control and fat metabolism

- Drinking cold water can boost metabolism by 10-30% for an hour.

Key Takeaway:

Eating metabolism-boosting foods helps increase calorie burn and enhance fat metabolism.



# Gut Microbiome and Metabolism –

## The Role of Probiotics



### How Gut Bacteria Affects Metabolism

- The gut microbiome influences energy extraction, fat storage, and inflammation.
- Good bacteria (e.g., Lactobacillus, Bifidobacteria) improve insulin sensitivity.
- Imbalanced gut bacteria (dysbiosis) can lead to obesity and metabolic disorders.

### Metabolism-Boosting Probiotics

- Yogurt & Kefir – Supports healthy gut bacteria
- Kimchi & Sauerkraut – Fermented foods rich in probiotics
- Fiber-Rich Foods – Feeds beneficial gut microbes
- Prebiotics (Garlic, Onions, Bananas) – Nourishes good bacteria

### Key Takeaway:

A healthy gut microbiome optimizes digestion, regulates metabolism, and enhances fat-burning efficiency.



# Gut Microbiome and Metabolism – The Role of Probiotics



## Key Takeaways:

- Low-carb & keto diets shift metabolism towards fat-burning
- Intermittent fasting boosts metabolic efficiency & cellular repair
- Nutrient timing & calorie cycling prevent metabolic slowdown
- Thermogenic foods help burn more calories naturally
- Gut health plays a crucial role in metabolic function





# EXERCISE AND MOVEMENT STRATEGIES FOR METABOLIC OPTIMIZATION

Each bullet point corresponds to one slide, covering key insights into exercise and movement-based biohacking for metabolism.





# High-Intensity Interval Training (HIIT) vs. Steady-State Cardio



## What is HIIT?

- Short bursts of intense exercise followed by rest or low-intensity recovery.
- Example: 30 seconds sprint, 90 seconds walk (repeat for 15-20 minutes).

## What is Steady-State Cardio?

- Continuous moderate-intensity exercise (e.g., jogging, cycling) for an extended period.





# High-Intensity Interval Training (HIIT) vs. Steady-State Cardio



Metabolic Effects

Factor	HIIT	Steady-State Cardio
Fat Burn	Increases post-exercise calorie burn (EPOC effect)	Burns fat during exercise but minimal post-workout effects
Time Efficiency	Shorter workouts (15-30 min)	Longer sessions (45-60 min)
Muscle Retention	Preserves muscle mass	May lead to muscle loss if excessive
Metabolic Boost	Significantly raises metabolism	Moderate metabolic increase

**Key Takeaway:**  
HIIT is more **efficient for fat loss and metabolism** due to **higher post-exercise calorie burn (EPOC effect)**, while steady-state cardio is beneficial for endurance.





## Metabolic Reset

# Strength Training and Its Metabolic Impact



### Why Strength Training Matters for Metabolism

- Increases **lean muscle mass**, which **raises Basal Metabolic Rate (BMR)**.
- Enhances **insulin sensitivity** and glucose regulation.
- Strengthens bones and reduces the risk of metabolic diseases.

### Metabolic Benefits of Strength Training

- **Afterburn Effect (EPOC):** Post-workout calorie burn lasts for hours.
- **Muscle = Higher Resting Energy Expenditure:** More muscle = more calories burned at rest.
- **Fat Oxidation Boost:** Improves body's ability to use fat as fuel.

### Best Strength Training Strategies for Metabolism

- Compound movements (squats, deadlifts, push-ups).
- Progressive overload (gradually increasing resistance).
- Full-body workouts (3-4 times per week for maximum metabolic impact).

### Key Takeaway:

Strength training **increases long-term metabolic rate** by building lean muscle and enhancing post-exercise calorie burn.



# NEAT (Non-Exercise Activity Thermogenesis) and Metabolic Health



## Key Takeaway:

Small daily movements significantly **boost metabolism** and prevent metabolic slowdown.

## What is NEAT?

- Calories burned from **daily, non-exercise activities**.
- Includes walking, fidgeting, standing, household chores.

## Why NEAT is Important

- Accounts for **15-50% of daily energy expenditure**.
- More NEAT = **higher metabolic rate** without structured exercise.
- **Sitting too much slows metabolism** and reduces calorie burn.

## Ways to Increase NEAT

- Walk more (take stairs, park farther away).
- Use a standing desk.
- Take movement breaks (every 30-60 minutes).
- Walk while on phone calls.
- Household activities (cleaning, gardening).





# Cold Exposure (Cryotherapy) and Thermogenesis



## How Cold Exposure Affects Metabolism

- Activates **Brown Adipose Tissue (BAT)**, which **burns calories** for heat production.
- Increases **norepinephrine levels**, enhancing fat oxidation.
- Improves **mitochondrial efficiency** for energy production.



# Cold Exposure (Cryotherapy) and Thermogenesis



## Methods of Cold Exposure

- **Cold Showers** – 30 seconds to 2 minutes.
- **Ice Baths** – 5-10 minutes in cold water.
- **Outdoor Cold Exposure** – Walking in cold temperatures.
- **Cryotherapy Chambers** – Full-body cold immersion.





# Cold Exposure (Cryotherapy) and Thermogenesis



## Metabolic Benefits

- Boosts fat burning through **non-shivering thermogenesis**.
- Improves insulin sensitivity and blood sugar regulation.
- Enhances **recovery** from exercise and reduces inflammation.

## Key Takeaway:

Cold exposure **stimulates thermogenesis**, helping **burn more calories** and **improve metabolic health**.





## Metabolic Reset

# Heat Therapy (Saunas, Hot Baths) and Mitochondrial Function



### How Heat Affects Metabolism

- Raises **core body temperature**, increasing **caloric burn**.
- Enhances **heat shock proteins**, which protect cells and **improve mitochondrial function**.
- Improves **cardiovascular health** and blood circulation.

### Types of Heat Therapy

- **Saunas (Infrared or Traditional)**
  - Increases heart rate like moderate exercise.
  - Promotes detoxification through sweating.
- **Hot Baths (Hydrotherapy)**
  - Boosts circulation and metabolic rate.
  - Helps with muscle recovery.
- **Heat Exposure from Exercise**
  - Activities like hot yoga mimic sauna effects.



## Metabolic Reset

# Heat Therapy (Saunas, Hot Baths) and Mitochondrial Function



### Metabolic Benefits

- Increases **growth hormone production**.
- Enhances **fat oxidation**.
- Improves **insulin sensitivity and glucose metabolism**.

#### Key Takeaway:

Heat therapy **stimulates mitochondrial function**, enhancing metabolic efficiency and overall health.



# Heat Therapy (Saunas, Hot Baths) and Mitochondrial Function



## Conclusion

### Key Takeaways

- **HIIT is superior for post-workout calorie burn**, while steady-state cardio supports endurance.
- **Strength training increases muscle mass**, leading to a higher resting metabolic rate.
- **NEAT plays a crucial role** in maintaining energy balance and preventing metabolic slowdown.
- **Cold exposure enhances thermogenesis**, leading to increased fat oxidation and calorie burn.
- **Heat therapy improves mitochondrial function**, aiding metabolic efficiency and recovery.





# METABOLIC RESET

Supplements and Nutraceuticals for Metabolic Biohacking

Each bullet point corresponds to one slide, providing key insights into the role of supplements in optimizing metabolism.





## Metabolic Reset

# Caffeine and Green Tea Extract for Thermogenesis



### How Caffeine Enhances Metabolism

- **Increases Thermogenesis:** Stimulates the release of catecholamines (epinephrine and norepinephrine), increasing heat production and calorie burning.
- **Boosts Lipolysis:** Breaks down stored fat into free fatty acids for energy.
- **Enhances Exercise Performance:** Improves endurance and reduces perceived exertion.

### How Green Tea Extract Enhances Metabolism

- **Contains EGCG (Epigallocatechin Gallate):** Enhances fat oxidation and synergizes with caffeine for greater thermogenic effect.
- **Improves Insulin Sensitivity:** Helps regulate blood sugar levels.
- **Supports Mitochondrial Function:** Protects cells from oxidative stress.

#### Key Takeaway:

Caffeine and green tea extract **increase calorie burn, enhance fat oxidation, and improve energy levels.**





### Key Takeaway:

Creatine **supports ATP production, muscle growth, and metabolic efficiency.**

# Creatine and Its Role in ATP Production



## What is Creatine?

- A naturally occurring compound found in muscle cells.
- Stored as **phosphocreatine**, which helps **recycle ATP** during high-intensity activities.

## Metabolic Benefits

- **Enhances ATP Production:** Provides quick energy during exercise.
- **Boosts Strength and Muscle Mass:** More muscle = higher resting metabolic rate.
- **Improves Brain Function:** Supports mitochondrial health in neurons.
- **Increases Work Capacity:** Allows for longer and more intense workouts.

## Who Benefits from Creatine?

- Strength athletes, endurance athletes, and those seeking cognitive enhancement.





# L-Carnitine and Fat Metabolism



## What is L-Carnitine?

- A compound that **transports fatty acids into mitochondria** for energy production.
- Essential for efficient **fat oxidation**.

## Metabolic Benefits

- **Enhances Fat Burning:** Converts stored fat into usable energy.
- **Improves Exercise Performance:** Reduces muscle fatigue and enhances endurance.
- **Supports Heart Health:** Helps lower triglycerides and improve cardiovascular function.
- **Boosts Mitochondrial Function:** Essential for cellular energy production.

## Best Sources

- Red meat, fish, dairy, and supplementation.

### Key Takeaway:

L-Carnitine **optimizes fat metabolism, increases endurance, and enhances mitochondrial efficiency.**



# Berberine and Its Effects on Insulin Sensitivity

### What is Berberine?

- A bioactive compound extracted from plants.
- Acts similarly to **metformin**, a diabetes medication.

### Metabolic Benefits

- **Improves Insulin Sensitivity:** Reduces insulin resistance and stabilizes blood sugar.
- **Activates AMPK (Energy Sensor):** Enhances fat oxidation and mitochondrial function.
- **Reduces Inflammation:** Lowers oxidative stress, supporting metabolic health.
- **Supports Gut Microbiome:** Improves digestion and microbiome balance.

### Clinical Findings

- Shown to **lower blood glucose by 20-30%** in some studies.
- May aid **weight loss by improving fat metabolism.**



### Key Takeaway:

Berberine **improves insulin function, regulates blood sugar, and enhances metabolic health.**



# Mitochondrial Enhancers – CoQ10, PQQ, NAD+, Resveratrol



## Why Mitochondrial Health Matters

- Mitochondria are the **powerhouses of cells**, producing ATP.
- Dysfunctional mitochondria lead to **low energy, metabolic disorders, and aging**.

## Key Mitochondrial Enhancers

Supplement	Function
CoQ10 (Coenzyme Q10)	Enhances ATP production, protects against oxidative stress
PQQ (Pyrroloquinoline Quinone)	Stimulates new mitochondria formation (mitochondrial biogenesis)
NAD+ (Nicotinamide Adenine Dinucleotide)	Essential for energy metabolism, DNA repair, and longevity
Resveratrol	Activates sirtuins, improves mitochondrial efficiency, and supports anti-aging

## Who Can Benefit?

- Individuals with **low energy, metabolic disorders, or aging-related decline**.

### Key Takeaway:

Mitochondrial enhancers **support energy production, longevity, and metabolic function.**





# Mitochondrial Enhancers – CoQ10, PQQ, NAD<sup>+</sup>, Resveratrol



## Conclusion

### Key Takeaways from Week 4

- **Caffeine and green tea extract boost thermogenesis**, helping with fat oxidation.
- **Creatine enhances ATP production**, improving strength and energy.
- **L-Carnitine optimizes fat metabolism**, transporting fatty acids into mitochondria.
- **Berberine regulates insulin sensitivity**, improving metabolic efficiency.
- **Mitochondrial enhancers improve energy production**, longevity, and overall metabolic function.



# METABOLIC RESET

Technology and Biohacking Tools

Each bullet point corresponds to one slide, providing key insights into cutting-edge biohacking technologies for metabolic optimization.





Metabolic Reset

Wearable Devices for Metabolic Tracking  
(CGM, HRV Monitors, Oura Ring)

How Wearables Help Optimize Metabolism

- Provide **real-time insights** into metabolic health.
- Track **glucose fluctuations, heart rate variability (HRV), sleep quality, and recovery.**
- Help personalize nutrition, exercise, and lifestyle choices.

Key Wearable Devices

Device	Function
Continuous Glucose Monitors (CGM) – Levels, NutriSense	Tracks blood sugar in real-time to optimize diet and insulin response
HRV Monitors – WHOOP, Polar H10	Measures heart rate variability, indicating stress and recovery levels
Oura Ring	Tracks sleep cycles, body temperature, and metabolic rate

Key Takeaway:

Wearable devices provide **valuable metabolic data** that can be used for **personalized health optimization.**



# How to Use Continuous Glucose Monitors (CGMs) to Optimize Metabolism



## Overview

A **Continuous Glucose Monitor (CGM)** is a wearable device that tracks blood glucose levels in real time. It provides insights into **how food, exercise, stress, and sleep affect metabolic health**, allowing users to make **data-driven decisions** for optimizing energy, performance, and fat loss.

## How CGMs Work

1. A small **sensor** is inserted just under the skin (usually on the arm or abdomen).
2. The sensor continuously **measures interstitial glucose levels** (fluid surrounding cells) every few minutes.
3. A **reader or smartphone app** displays real-time glucose trends.
4. Some CGMs integrate with **health tracking apps** (Levels, NutriSense, Veri) to provide insights and recommendations.





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How to Use Continuous Glucose Monitors (CGMs) to Optimize Metabolism

Popular CGM Devices

CGM Device	Features
Freestyle Libre 2	No calibration required, 14-day wear
Dexcom G7	Real-time alerts, seamless smartphone integration
Levels Health (Powered by Freestyle Libre)	Advanced analytics and metabolic coaching
NutriSense	Personal dietitian support with glucose tracking





# How to Use CGMs for Metabolic Optimization

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## Step 1: Establish Baseline Glucose Levels

- Wear the CGM for the **first 5-7 days** without making changes.
- Track **fasting glucose** (ideal range: **70-90 mg/dL**).
- Monitor **post-meal glucose spikes** (should not exceed **30 mg/dL increase**).
- Identify glucose fluctuations **during the day and night**.

**Goal:** Understand your **standard glucose patterns** before making adjustments.



# How to Use CGMs for Metabolic Optimization



## Step 2: Optimize Nutrition for Stable Blood Sugar

### Identify High-Impact Foods

- **Track glucose response** to meals (spikes over **140 mg/dL** indicate poor metabolic control).
- **Avoid foods that cause excessive glucose spikes**, such as:
  - Refined carbs (white bread, pastries, processed cereals).
  - Sugary drinks and fruit juices.
  - High-glycemic foods (white rice, potatoes without fiber or protein).





# How to Use CGMs for Metabolic Optimization

Step 2: Optimize Nutrition for Stable Blood Sugar

Improve Meal Composition

- Pair **carbs with protein, fiber, and healthy fats** to reduce glucose spikes.
- **Preload meals** with vegetables or vinegar (apple cider vinegar before a meal can lower glucose spikes).
- Consume **protein before carbs** to slow glucose absorption.
- Try **time-restricted eating** (consume meals within an 8-12 hour window).

Example of Optimized Meal Strategy

Meal Timing	Optimized Meal
Breakfast	Scrambled eggs + avocado + whole grain toast
Lunch	Grilled salmon + quinoa + roasted vegetables
Snack	Greek yogurt + almonds + blueberries
Dinner	Chicken stir-fry with broccoli and cauliflower rice





# How to Use CGMs for Metabolic Optimization



## Step 3: Use CGM to Optimize Exercise for Glucose Control

### Best Practices for Exercise and Blood Sugar

- **Monitor glucose response to workouts** (a spike  $>180$  mg/dL after exercise may indicate too much stress).
- **Strength Training:** Helps **improve insulin sensitivity** and lower baseline glucose.
- **Low-Intensity Cardio (Walking, Yoga):** Helps **stabilize glucose after meals**.
- **High-Intensity Workouts (HIIT, Sprints):** May cause **temporary glucose spikes**, but improve overall metabolic health.
- **Post-Meal Walks (10-15 min):** Significantly **reduce post-meal glucose spikes**.



# How to Use CGMs for Metabolic Optimization



### Step 4: Reduce Stress and Improve Sleep

- **Track nighttime glucose trends** (ideal fasting glucose: **70-90 mg/dL**).
- **Identify stress-related glucose spikes** (high glucose in the morning can indicate **elevated cortisol levels**).
- **Improve sleep hygiene:** Poor sleep leads to **higher fasting glucose and insulin resistance**.
  - Maintain a **consistent sleep schedule**.
  - Avoid **late-night eating** (causes glucose spikes overnight).
  - Use **blue light blockers** before bed.





# How to Use CGMs for Metabolic Optimization

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## Step 5: Experiment with Fasting and Meal Timing

- **Track glucose levels during intermittent fasting (IF):**
  - **Morning glucose should remain steady** (not drop below 60 mg/dL).
  - **Prolonged fasting (24+ hrs)** should not cause glucose dips below **55 mg/dL** (sign of hypoglycemia).
- **Test early vs. late eating windows:**
  - Some people handle carbs better in the **afternoon/evening** than in the morning.
- **Use CGM to fine-tune fasting duration** for optimal glucose stability.



# How to Use CGMs for Metabolic Optimization

Step 6: Optimize Supplements Based on CGM Data

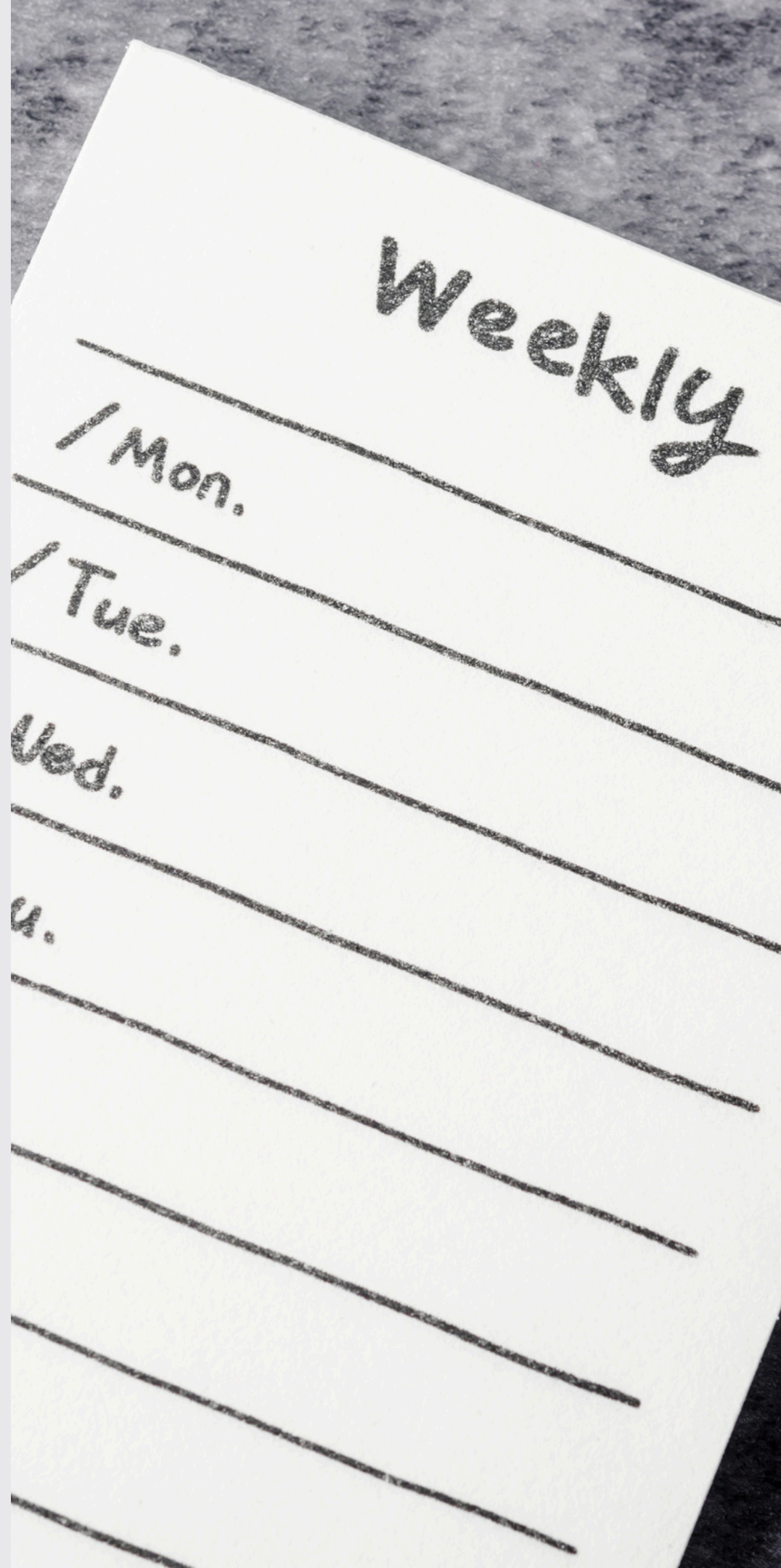
Supplements That Support Glucose Stability

Supplement	Function
Berberine	Improves insulin sensitivity, mimics metformin
Cinnamon Extract	Lowers glucose response to meals
Apple Cider Vinegar	Reduces post-meal glucose spikes
Magnesium	Supports insulin function
Alpha-Lipoic Acid (ALA)	Enhances glucose uptake in muscles





# How to Use CGMs for Metabolic Optimization



## Step 7: Fine-Tune and Adjust Based on Data Trends

- Review **weekly glucose trends** and make **incremental dietary and lifestyle changes**.
- Adjust **exercise timing** based on glucose stability.
- Modify **meal composition and timing** based on individual response.
- If glucose remains high despite interventions, consult a **functional medicine practitioner** for further insights.





# How to Use CGMs for Metabolic Optimization



## Key Takeaways

- **Real-time glucose tracking** helps personalize diet, exercise, and lifestyle.
- **Stable glucose levels** improve **fat-burning, energy, and cognitive function**.
- **Food timing and composition** significantly impact metabolic efficiency.
- **Exercise, fasting, and stress management** play a crucial role in optimizing glucose control.
- **CGM data helps identify the best approach** for personalized metabolic biohacking.

## Conclusion

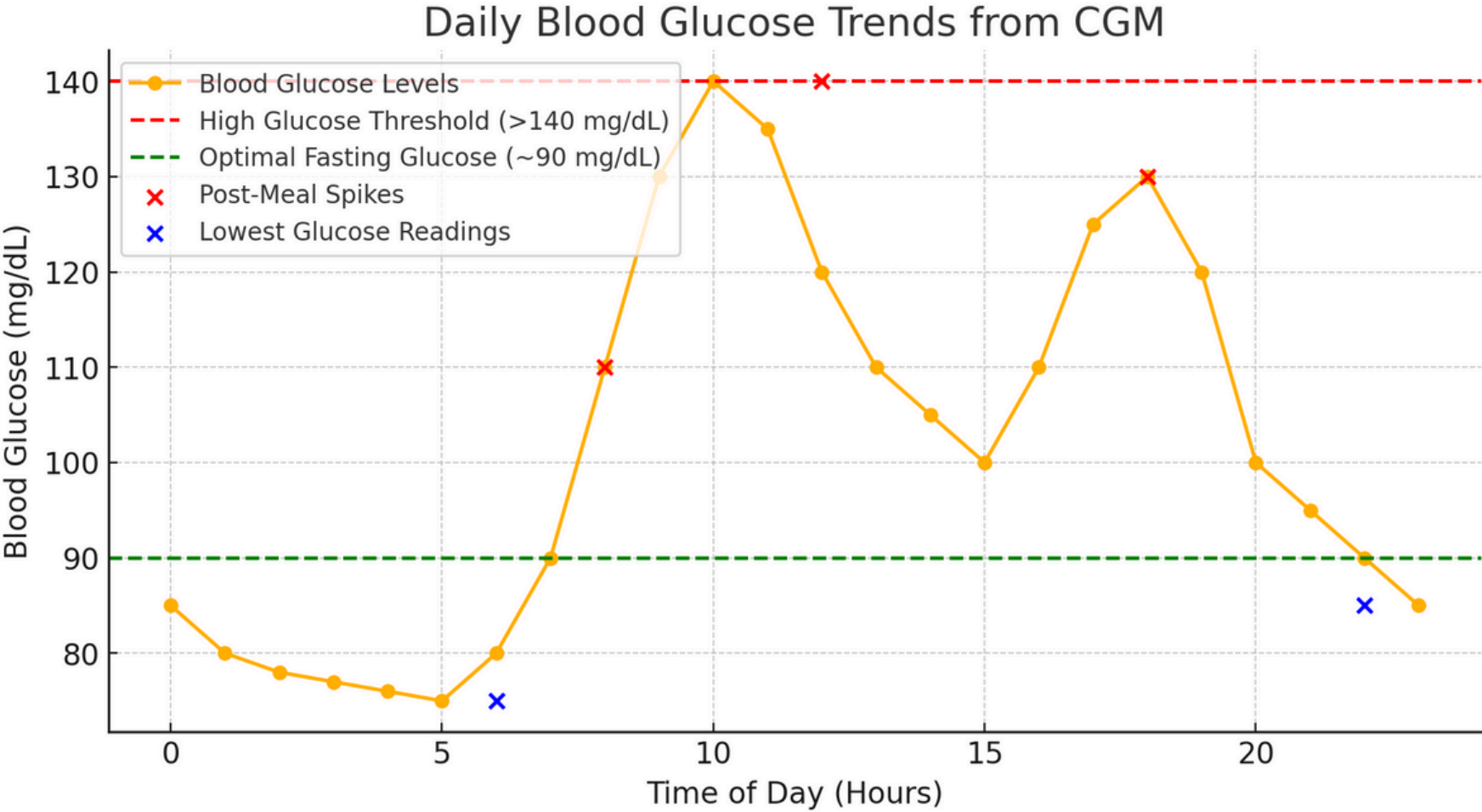
Using a CGM allows **real-time metabolic tracking**, helping individuals make **data-driven choices** to enhance energy, reduce fat storage, and prevent metabolic diseases.





Metabolic Reset

How to Use CGMs for Metabolic Optimization



Key Insights from the Chart:

1. Morning Stability:

- Blood glucose remains low and stable (~75-85 mg/dL) during fasting hours.
- This indicates a good metabolic state with no excessive overnight glucose spikes.

2. Post-Meal Glucose Spikes:

- **Breakfast (~8 AM)** → Moderate spike (~110 mg/dL).
- **Lunch (~12 PM)** → Sharp spike (~140 mg/dL), possibly due to a high-carb meal.
- **Dinner (~6 PM)** → Another significant rise (~130 mg/dL).

3. Metabolic Response & Recovery:

- Glucose **gradually declines** after meals, indicating normal insulin function.
- Post-dinner levels **return to baseline before bedtime**, preventing overnight glucose elevation.

4. Lowest Readings (~6 AM & 10 PM):

- This suggests effective glucose regulation during fasting periods.
- If levels dropped too low (<60 mg/dL), it could indicate excessive fasting stress.



# How to Optimize Based on This CGM Data



### If Glucose Spikes Over 140 mg/dL:

- **Reduce high-glycemic carbs** and pair meals with **fiber, protein, and healthy fats**.
- **Preload meals** with **vinegar or fiber-rich foods** (e.g., salad before carbs).
- **Take a 10-15 min walk after meals** to improve glucose clearance.

### If Fasting Glucose is Too High (>100 mg/dL):

- Improve **insulin sensitivity** through **strength training** and **low-carb meals in the evening**.
- Check for **hidden sugar sources** in diet (processed foods, sweetened beverages).

### If Glucose Dips Below 70 mg/dL:

- Increase **complex carbohydrates** and **protein intake** to prevent hypoglycemia.
- Avoid excessive fasting or very low-carb diets if experiencing frequent dips.



# How CGM Data Helps Personalize Metabolism

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- **Track how your body responds to different foods** and adjust meal composition accordingly.
- **Identify the best fasting duration** by monitoring glucose stability.
- **Measure exercise effectiveness** by observing glucose clearance post-workout.
- **Monitor stress and sleep impact** on glucose fluctuations overnight.

This **data-driven approach** enables **biohackers** to fine-tune metabolism, improve insulin sensitivity, and enhance overall metabolic health.



# METABOLIC RESET

## Alternative Tools for Metabolic Tracking (Beyond CGMs)

While **Continuous Glucose Monitors (CGMs)** provide real-time blood sugar insights, **other biohacking tools** can help track **metabolism, fat oxidation, insulin sensitivity, and mitochondrial efficiency** using different mechanisms. Below are some **alternative metabolic tracking tools** and how they work.





# Alternative Tools for Metabolic Tracking (Beyond CGMs)

## 1. Lumen – Metabolic Breath Analyzer

How It Works:

- Measures **CO2 levels in your breath** to determine if you're burning **carbs or fat** for energy.
- Uses **Respiratory Exchange Ratio (RER)** to track **metabolic flexibility**.
- Provides **real-time diet and fasting recommendations** to optimize fat-burning.

Key Features:

Feature	Benefit
Measures CO2	Determines whether you're in <b>fat-burning or carb-burning mode</b>
Personalized Nutrition	Recommends <b>carb intake adjustments</b> based on metabolic state
Tracks Fasting Effectiveness	Identifies when your body shifts into <b>fat oxidation</b>
Syncs with Mobile App	Provides <b>daily metabolic insights</b> and personalized strategies

Best For:

- People who want to **track their body’s fuel source (fat vs. carbs)**.
- Those practicing **intermittent fasting or ketogenic diets**.
- Individuals looking to **improve metabolic flexibility** over time.





# Alternative Tools for Metabolic Tracking (Beyond CGMs)



## 2. Dexcom G7 – Advanced Glucose Monitoring

- **How It Differs from Other CGMs:**
- Provides **real-time glucose alerts** to detect **blood sugar trends early**.
- Syncs with **smartwatches, Apple Health, and fitness trackers**.
- Unlike standard CGMs, **does not require fingerstick calibration**.

### Why Use Dexcom Over Other CGMs?

- Ideal for **biohackers** who want **continuous glucose tracking** with **real-time alerts**.
- Useful for individuals who need **instant feedback on food choices, fasting, and exercise impacts**.



# Alternative Tools for Metabolic Tracking (Beyond CGMs)



## 3. WHOOP Strap – Heart Rate Variability (HRV) & Recovery Monitor

### How It Works:

- Measures **HRV (Heart Rate Variability)** to assess **autonomic nervous system balance**.
- Tracks **strain, recovery, and sleep metrics** to optimize metabolic function.
- Helps determine **when to push harder vs. when to rest** based on physiological stress.

### Key Features:

Metric	What It Tells You
HRV (Heart Rate Variability)	Indicates <b>metabolic stress and recovery ability</b>
Resting Heart Rate (RHR)	Tracks cardiovascular and metabolic efficiency
Strain & Recovery Score	Helps <b>adjust workouts &amp; recovery</b> for optimized metabolism
Sleep Tracking	Identifies <b>poor sleep’s effect on glucose metabolism</b>

### Best For:

- People who want to **track metabolic stress and recovery cycles**.
- Individuals optimizing **workouts, fasting, and recovery strategies**.





# Alternative Tools for Metabolic Tracking (Beyond CGMs)



## 4. Biosense – Ketone Breath Analyzer

### How It Works:

- Measures **acetone levels in breath**, which reflect **fat oxidation and ketosis levels**.
- More accurate than **urine ketone strips** and **less invasive than blood ketone testing**.

### Key Features:

Metric	What It Measures
Ketone Levels (ACE Score)	Shows if you are in <b>fat-burning mode</b>
Fasting Effectiveness	Determines if <b>prolonged fasting increases ketone production</b>
Real-Time Fat Metabolism	Helps <b>optimize carb intake &amp; keto diet success</b>

### Best For:

- Individuals practicing **ketogenic diets, fasting, or fat-loss strategies**.
- People who want **non-invasive ketone tracking** without blood tests.







5. Mitochondrial Function Tests (OxiScore, MyDNAge)

How They Work:

- Measure **oxidative stress and mitochondrial efficiency** in the body.
- Provide insights into **how well mitochondria are producing ATP (energy)**.
- Identify **metabolic aging markers** and **cellular repair efficiency**.

Key Features:

Test Type	Function
OxiScore Test	Measures <b>oxidative stress and antioxidant levels</b>
MyDNAge Epigenetic Test	Assesses <b>metabolic aging based on DNA methylation</b>
SpectraCell Micronutrient Test	Identifies <b>nutrient deficiencies affecting mitochondria</b>

Best For:

- People who suspect **mitochondrial dysfunction or metabolic slowdowns**.
- Individuals tracking **cellular aging and longevity**.





# Alternative Tools for Metabolic Tracking (Beyond CGMs)



## 6. VO2 Max Testing – Cardiovascular & Metabolic Efficiency

How It Works:

- Measures **oxygen consumption during exercise** to determine **aerobic efficiency**.
- Helps determine **fat vs. carb burning at different exercise intensities**.
- Used by **athletes and biohackers** to track **metabolic improvements**.

Key Features:

Metric	What It Measures
VO2 Max Score	Determines <b>cardiorespiratory and metabolic efficiency</b>
Fat Utilization at Rest & Exercise	Identifies <b>how well you burn fat vs. carbs</b>
Metabolic Efficiency	Tracks <b>fitness gains and endurance improvements</b>

Best For:

- Individuals optimizing **cardiovascular fitness and fat adaptation**.
- Biohackers tracking **exercise metabolism efficiency**.





# Alternative Tools for Metabolic Tracking (Beyond CGMs)



## 7. Ultrahuman Ring – Next-Generation Metabolic Tracker

How It Works:

- Tracks **metabolic flexibility, HRV, sleep, and recovery metrics.**
- Uses **AI-based metabolic scoring** to optimize daily activity and recovery.

Key Features:

Metric	Benefit
Metabolic Score	AI-generated score for <b>daily metabolism health</b>
HRV & Stress Monitoring	Helps <b>balance nervous system and metabolism</b>
Sleep & Recovery Tracking	Identifies <b>poor sleep’s impact on metabolism</b>

Best For:

- People looking for a **wearable ring alternative to CGMs and smartwatches.**
- Those who want **metabolic insights beyond just glucose tracking.**



# Alternative Tools for Metabolic Tracking (Beyond CGMs)

Summary: Comparing Metabolic Tracking Tools

Tool	What It Tracks	Best For
CGM (Levels, NutriSense)	Glucose fluctuations	Blood sugar control & insulin sensitivity
Lumen	Fat vs. carb burning	Metabolic flexibility & fasting optimization
WHOOP	HRV & recovery	Stress, metabolism, & workout optimization
Biosense	Ketone levels	Keto diet, fasting, & fat metabolism
VO2 Max Test	Oxygen use & metabolism	Endurance, fat adaptation, & fitness
Mitochondrial Tests	ATP efficiency	Longevity & mitochondrial biohacking
Ultrahuman Ring	HRV, metabolism, & recovery	AI-driven metabolic insights





# Alternative Tools for Metabolic Tracking (Beyond CGMs)

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*Final thoughts*



## Final Thoughts

- **CGMs track blood sugar**, but other tools provide insights into fat oxidation, metabolic stress, mitochondrial health, and recovery.
- **Choosing the right tool depends on metabolic goals** (e.g., glucose control, fat burning, exercise optimization).
- **Combining multiple tools (CGM + HRV monitor + ketone tracker)** gives a **full picture of metabolic health**.



# METABOLIC RESET

## Integrating Multiple Tools for a Comprehensive Metabolic Biohacking Strategy

Optimizing metabolism requires **a multi-faceted approach** that goes beyond tracking just one variable (e.g., glucose levels). By **combining different tools**, you can get a **holistic view of metabolic efficiency, fat oxidation, insulin sensitivity, and recovery capacity**.

Below is a step-by-step guide to integrating multiple **biohacking tools** for **real-time metabolic optimization**.





Metabolic Reset

Integrating Multiple Tools for a Comprehensive Metabolic Biohacking Strategy

Step 1: Establish Your Baseline Metabolic Health

Tools to Use

Tool	Metric Tracked	Purpose
CGM (Levels, NutriSense)	Blood glucose levels	Identify glucose fluctuations & insulin sensitivity
Lumen (Breath Analyzer)	Fat vs. carb burning	Determine metabolic flexibility
Biosense (Ketone Analyzer)	Ketone levels	Measure fat oxidation & fasting response
VO2 Max Testing	Oxygen efficiency	Assess aerobic metabolism & endurance

How to Use These Tools Together

1. **Use a CGM for 7-14 days** to track blood glucose patterns, meal responses, and fasting impact.
2. **Measure metabolic flexibility with Lumen daily** to understand when your body burns carbs vs. fat.
3. **Test ketone levels with Biosense** after fasting or keto meals to ensure optimal fat oxidation.
4. **Perform a VO2 max test once a month** to measure improvements in metabolic efficiency from exercise.

Insights You Gain

- Which foods **spike blood glucose** vs. those that keep it stable.
- How **fasting** and **exercise** shift your metabolism between **carbs and fat burning**.
- If you're truly in **fat-burning mode (ketosis)** after extended fasting.
- How **cardio fitness and oxygen efficiency impact metabolic function**.



Metabolic Reset

Integrating Multiple Tools for a Comprehensive Metabolic Biohacking Strategy

Step 2: Optimize Diet & Fasting Windows

Tools to Use

Tool	Metric Tracked	Purpose
CGM (Levels, NutriSense)	Blood sugar response	Optimize meal composition & timing
Lumen	Fat vs. carb burning	Adjust macronutrient intake for fat-burning
HRV Monitor (WHOOP, Oura Ring)	Stress & recovery	Avoid metabolic burnout from over-fasting or exercise
Biosense (Ketone Analyzer)	Ketone levels	Ensure proper fat adaptation during keto & fasting

How to Use These Tools Together

1. **Before eating**, use **Lumen** to check if you're in a fat-burning or carb-burning state.
2. **After meals**, monitor **glucose spikes with CGM** to find the best macronutrient ratios for stable blood sugar.
3. **Track ketone levels post-fasting** with Biosense to confirm optimal fat oxidation.
4. **Monitor HRV (with WHOOP or Oura Ring)** to ensure fasting isn't causing excess stress (low HRV signals metabolic strain).

Insights You Gain

- How to **personalize meal timing and composition** to avoid glucose spikes.
- Whether fasting **switches your body into a fat-burning mode** (or if adjustments are needed).
- If fasting is **stressing the body too much**, based on HRV data.





Metabolic Reset

Integrating Multiple Tools for a Comprehensive Metabolic Biohacking Strategy

Step 3: Improve Exercise for Maximum Metabolic Benefits

Tools to Use

Tool	Metric Tracked	Purpose
VO2 Max Test	Oxygen efficiency	Measure aerobic capacity & endurance
CGM (Levels, NutriSense)	Glucose response to exercise	Optimize pre/post-workout fueling
HRV Monitor (WHOOP, Oura)	Recovery & strain	Prevent overtraining & metabolic stress
Lumen	Fat vs. carb utilization	Determine the best workout intensity for fat loss

How to Use These Tools Together

1. **Test VO2 Max once a month** to measure metabolic efficiency and endurance gains.
2. **Monitor glucose changes in CGM before and after workouts** (should drop during low-intensity but rise with HIIT).
3. **Check Lumen before workouts** to determine if your body is burning carbs or fat for fuel.
4. **Use HRV tracking to assess recovery** – if HRV is low, reduce workout intensity to avoid overtraining.

Insights You Gain

- The **best type of exercise (HIIT vs. endurance)** for your metabolism.
- Whether **fasted workouts** actually improve fat burning.
- If **pre-workout carbs are needed** or if you perform better in a fasted state.
- How **workout intensity impacts metabolic recovery and overall stress load**.



Metabolic Reset

Integrating Multiple Tools for a Comprehensive Metabolic Biohacking Strategy

Step 4: Optimize Sleep & Recovery for Metabolic Health

Tools to Use

Tool	Metric Tracked	Purpose
Oura Ring / WHOOP	Sleep quality & HRV	Ensure deep recovery & stress balance
CGM (Levels, NutriSense)	Nighttime glucose fluctuations	Detect poor sleep's effect on insulin resistance
Red Light Therapy (Joovv, MitoRed)	Mitochondrial function	Improve cellular recovery & metabolic efficiency

How to Use These Tools Together

1. **Use CGM overnight** to see if glucose spikes correlate with poor sleep.
2. **Track HRV & sleep quality** with Oura/WHOOP to monitor deep sleep & recovery.
3. **Apply red light therapy (Joovv or MitoRed) before bed** to enhance mitochondrial repair and improve sleep quality.

Insights You Gain

- How **poor sleep** affects glucose control and metabolism.
- If **stress or overtraining is reducing metabolic efficiency**.
- Whether **mitochondrial function** improves with red light therapy.





Metabolic Reset

Integrating Multiple Tools for a Comprehensive Metabolic Biohacking Strategy

Step 5: Fine-Tune with Genetic & Mitochondrial Testing

Tools to Use

Tool	Metric Tracked	Purpose
Genetic Testing (DNAfit, 23andMe)	Fat metabolism & insulin response	Identify genetic predispositions
Mitochondrial Tests (OxiScore, MyDNAge)	Cellular energy production	Detect metabolic aging & dysfunction

How to Use These Tools Together

1. Run a genetic test (DNAfit, 23andMe) to see if you have **genes that affect insulin sensitivity, fat metabolism, or exercise response**.
2. Test mitochondrial function (OxiScore, MyDNAge) to assess cellular energy production and aging markers.
3. Use these insights to adjust diet, exercise, and supplements for personalized metabolic optimization.

Insights You Gain

- If you are **genetically predisposed to insulin resistance or slow fat metabolism**.
- How **aging is affecting your metabolic efficiency**.
- Whether you need to **focus on mitochondrial support (CoQ10, NAD+, PQQ)** to improve energy production.



Metabolic Reset

Integrating Multiple Tools for a Comprehensive  
Metabolic Biohacking Strategy

Goal	Best Tool Combination
Optimize blood sugar & fasting	CGM + Biosense + HRV Monitor
Improve fat-burning & metabolism	Lumen + VO2 Max + Red Light Therapy
Fine-tune workout recovery	HRV (WHOOP/Oura) + CGM (post-exercise response)
Personalized nutrition	CGM + Lumen + Genetic Testing
Reduce metabolic stress	HRV Tracking + Red Light Therapy + Mitochondrial Testing

Key Takeaways

- **CGMs are powerful, but combining them with Lumen, HRV monitoring, and VO2 Max tests** provides a **full metabolic picture**.
- **Red Light Therapy and mitochondrial testing** add another layer for **long-term energy efficiency**.
- **Genetic insights allow for precise dietary and exercise adjustments** to match your body’s metabolic needs.






# METABOLIC RESET

Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking  
Using Multiple Tools

This protocol integrates **CGMs, Lumen, HRV monitoring, VO2 max testing, red light therapy, and genetic testing** into a structured routine for **daily and weekly metabolic optimization**.



METABOLISM

## Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



### Daily Biohacking Routine

This is a structured **morning-to-evening routine** that incorporates different metabolic tracking tools and interventions.

### 🕒 Morning Routine (Optimize Fat Oxidation & Energy Levels)

#### 1. Check Metabolic State (Lumen + CGM)

- **Lumen:** Measure if your body is in **fat-burning or carb-burning mode**.
- **CGM:** Check fasting glucose (**goal: 70-90 mg/dL**).
  - If glucose is **above 100 mg/dL**, consider adjusting **dinner timing or meal composition**.
  - If glucose is **below 70 mg/dL**, ensure **adequate protein and slow-digesting carbs in meals**.



# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Morning Routine (Optimize Fat Oxidation & Energy Levels)

### 2. Optimize Fat Burning & Metabolism

- **Fast (if glucose is stable):** 12-16 hours based on CGM & Lumen feedback.
- **Hydrate:** Drink **electrolyte-infused water or green tea** (boosts fat oxidation).
- **Cold Exposure (Cryotherapy or Cold Shower):** Enhances **brown fat activation & thermogenesis.**



# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Morning Routine (Optimize Fat Oxidation & Energy Levels)

### 3. Exercise Monitoring

- **Lumen Check Before Workout:**
  - If in **fat-burning mode**, do **low-intensity fasted cardio** (walking, yoga).
  - If in **carb-burning mode**, consider eating a **small protein & fat meal** before intense training.
- **CGM Response Post-Workout:**
  - If glucose spikes **above 140 mg/dL after HIIT**, consider adjusting workout intensity.
  - If glucose **drops too low (<70 mg/dL)**, increase **pre-workout nutrition**.





## Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Midday Routine (Optimize Glucose Stability & Nutrient Timing)

### 4. First Meal (Nutrient Timing Based on CGM & Lumen Data)

- **Pair Carbs with Protein & Fat:** Avoid glucose spikes by eating protein and fats first.
- **Check CGM 60 Min Post-Meal:**
  - If glucose **stays below 120 mg/dL**, meal composition is ideal.
  - If glucose **spikes above 140 mg/dL**, increase fiber or adjust carb intake.



## Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



### Midday Routine (Optimize Glucose Stability & Nutrient Timing)

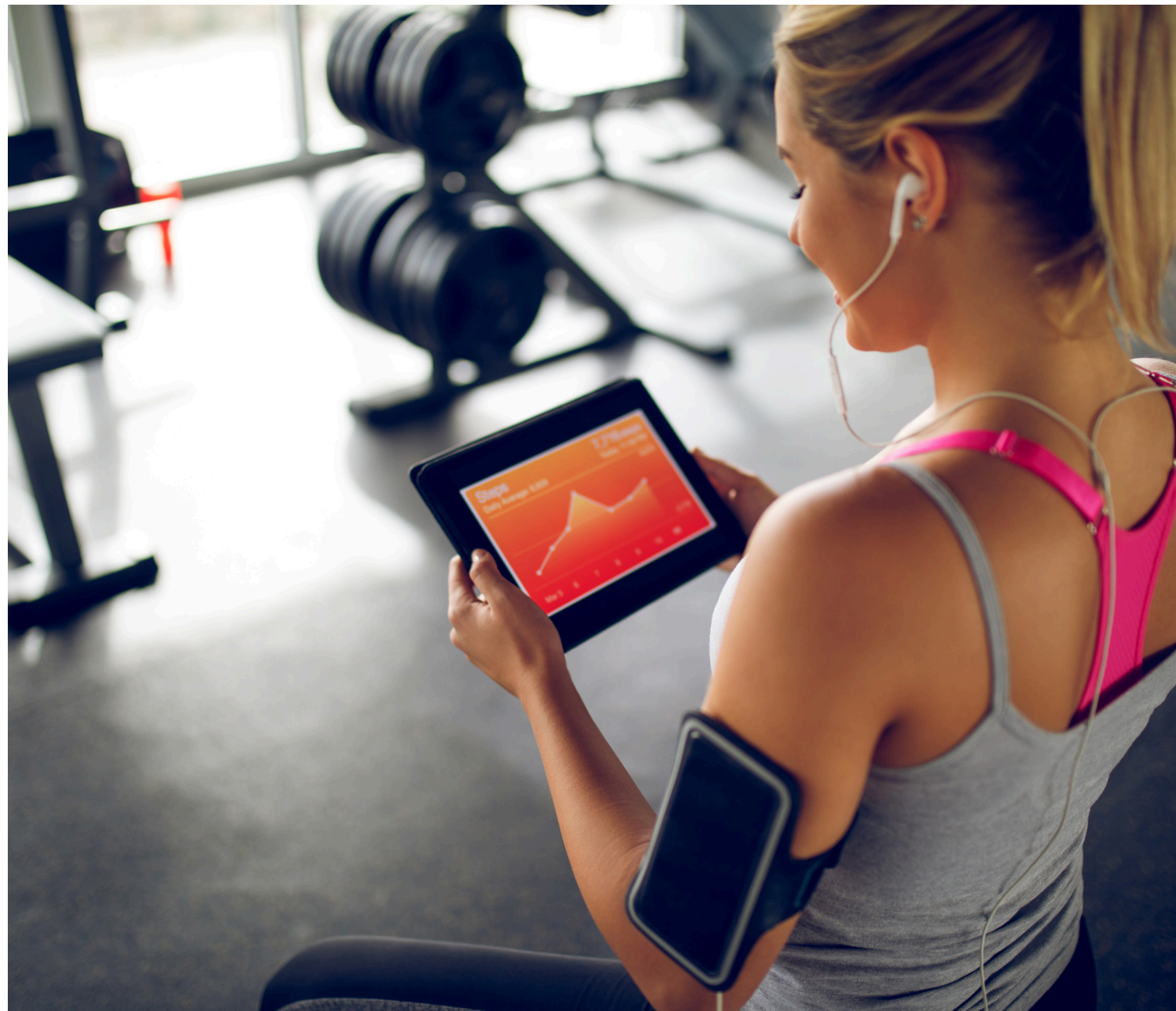
#### 5. Post-Meal Walk

- **10-15 minutes light walking**  
→ Reduces post-meal glucose spikes.
- Check CGM post-walk →  
**Goal: Glucose drops back to baseline within 90 minutes.**





# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Afternoon Routine (Workout & Recovery Optimization)

### 6. Exercise + Metabolic Tracking

- **Monitor HRV Before Exercise (WHOOP/Oura)**
  - If HRV is **high**, body is well-recovered → **Go for high-intensity training.**
  - If HRV is **low**, body is stressed → **Do light exercise or active recovery.**
- **Measure Lumen Before and After Exercise**
  - If in **fat-burning mode before workout**, consider **low-intensity training.**
  - If shifting to **carb-burning post-workout**, ensure **proper refueling.**
- **CGM Check Post-Workout**
  - If glucose **stays elevated >2 hours post-workout**, reduce workout intensity or adjust post-exercise meal timing.





## Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



Evening Routine (Optimize Sleep, Recovery & Mitochondrial Health)

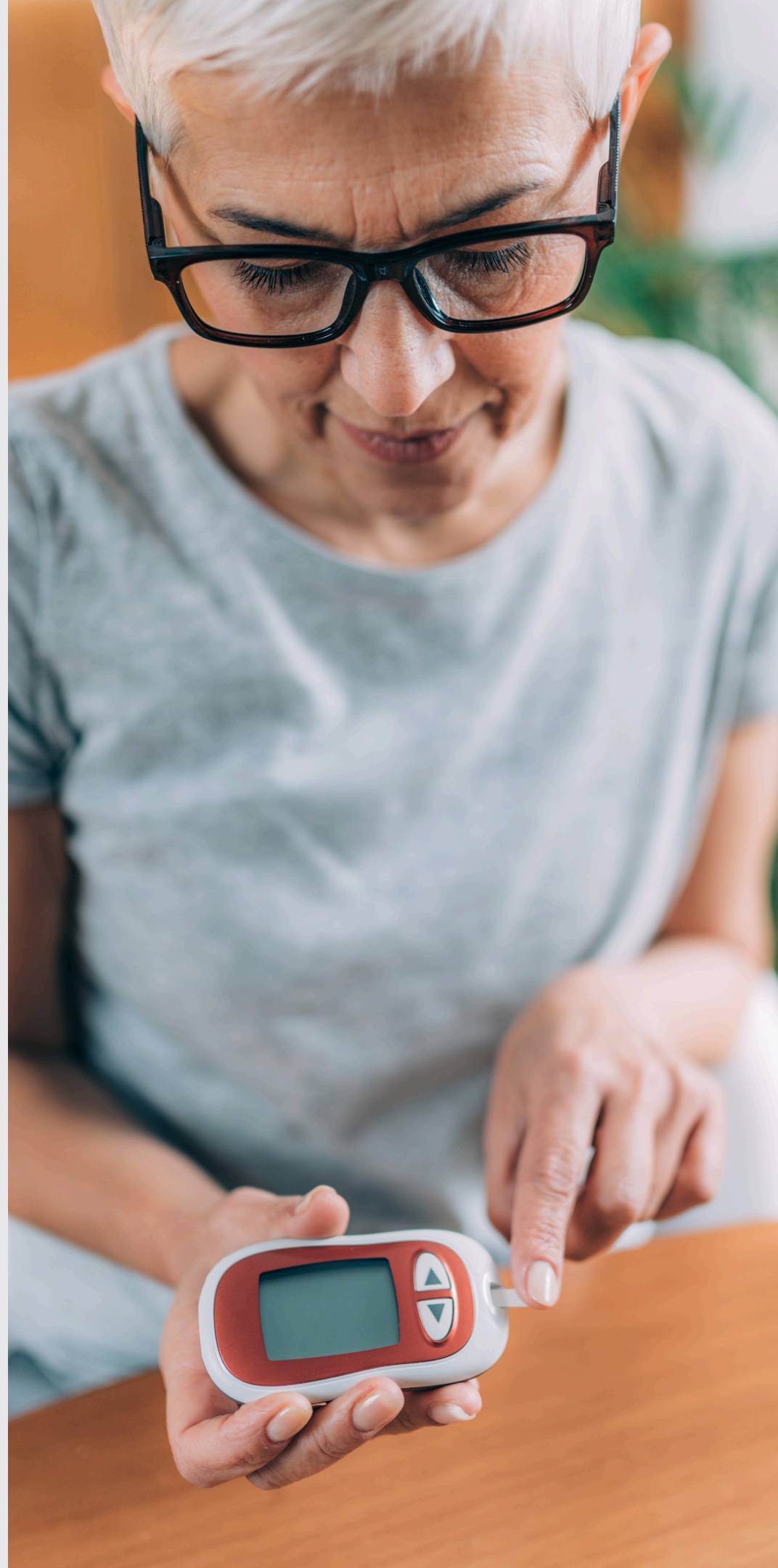
### 7. Meal Timing & Recovery

- **Final Lumen Check Before Dinner:** Determines whether to consume more **carbs or fats** based on metabolic state.
- **CGM Post-Dinner Check:**
  - If glucose remains high overnight, consider **eating earlier or reducing carb intake at dinner.**
- **HRV & Sleep Monitoring (WHOOP/Oura)**
  - Track HRV before bed → **Low HRV = more recovery needed.**
- **Red Light Therapy (Joovv/MitoRed)** → 10-20 minutes before bed to enhance **mitochondrial function and sleep quality.**



Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Weekly Biohacking Routine

### Monday: Metabolic Baseline Testing

- Measure Fasting Glucose & Lumen Levels (Fat vs. Carb Burn Mode)
- Review HRV Trends for the Week (Oura/WHOOP)
- Plan Meal Adjustments Based on CGM Data Trends

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## Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Weekly Biohacking Routine

### Tuesday: Workout

### Optimization & VO2 Max

### Check

- **Perform VO2 Max Test (if available)** → Helps determine **cardio efficiency** and **fat adaptation**.
- **Lumen Check Before & After Training** → Understand how workouts shift fuel utilization.





## Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Weekly Biohacking Routine

### Wednesday: Fasting & Fat Oxidation Day

- **Track CGM During a 16-Hour Fast** → Ensure glucose remains stable.
- **Measure Ketone Levels (Biosense) to Confirm Fat Burning Mode.**
- **Compare Lumen Readings** Before and After the Fast.





## Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Weekly Biohacking Routine

### Thursday: Insulin Sensitivity & Carb Refeed

- **Monitor CGM During Carb Refeed Meal** → Ensure glucose **returns to baseline within 90 minutes.**
- **HRV Tracking (WHOOP)** → Identify if the carb refeed affects recovery scores.





Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Weekly Biohacking Routine

### Friday: Recovery & Stress Assessment

- **Measure HRV & Sleep Quality (Oura/WHOOP).**
- **Infrared Sauna or Red Light Therapy** for Mitochondrial Recovery.





Metabolic Reset

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Weekly Biohacking Routine

### Saturday: Workout & Cold Therapy Day

- **Use Lumen Pre-Workout** → Determine best fuel source.
- **Compare CGM Response to Different Workout Intensities.**
- **Cold Exposure (Ice Bath or Cryotherapy) for Fat Activation.**

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# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Weekly Biohacking Routine

### Sunday: Data Review & Genetic Insights

- Analyze CGM Trends for the **Week**: Identify **meal timing & exercise improvements**.
- Check VO2 Max & HRV Trends for **long-term metabolic adaptation**.
- Use Genetic Test Data (23andMe, DNAFit) to Adjust **Diet & Exercise Strategies**.

# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



Example: Combining Multiple Tools for a Fat Loss Goal  
Scenario: A Biohacker Wants to Lose Fat Efficiently

Tool Used	How It Helps
CGM (NutriSense)	Identifies blood sugar spikes after meals.
Lumen	Determines when fat oxidation is occurring.
HRV Tracking (WHOOP)	Ensures fasting and workouts are not causing metabolic stress.
Biosense (Ketones)	Confirms fat-burning mode during fasting.
Red Light Therapy	Supports mitochondria for better energy metabolism.
Cold Exposure (Cryotherapy)	Stimulates brown fat and increases calorie burn.

## Optimized Fat Loss Strategy

- **Morning:** Lumen check → Low-carb breakfast if still burning carbs overnight.
- **Midday:** Post-meal CGM check → Ensure glucose stays below 120 mg/dL.
- **Afternoon:** Workout HRV check → If recovered, do HIIT; if low, opt for light cardio.
- **Evening:** Lumen check → If in fat-burning mode, continue fasting; if carb-burning, eat balanced meal.





# Step-by-Step Daily and Weekly Protocol for Metabolic Biohacking Using Multiple Tools



## Final Takeaways

- **CGM + Lumen + HRV**  
Monitoring provides a complete metabolic picture.
- **VO2 Max and Biosense**  
confirm fat oxidation and endurance capacity.
- **Red Light Therapy & Cold Exposure** enhance mitochondrial function & metabolic efficiency.
- **Tracking weekly trends** helps optimize diet, fasting, and workouts for long-term results.

# Daily Metabolic Tracking Checklist



Time of Day	CGM (Blood Glucose)	Lumen (Fat vs. Carb Burn)	HRV Tracking (WHOOP/Oura)
Morning	Check fasting glucose (goal: 70-90 mg/dL)	Check morning metabolic state	Monitor HRV before exercise
Midday	Monitor post-meal spike (goal: <120 mg/dL)	Check before/after meals to optimize fuel utilization	Assess HRV trends for recovery
Afternoon	Check glucose response to exercise	Check before/after exercise	Monitor post-workout HRV
Evening	Check nighttime glucose trends	Check before bed to determine next-day strategy	Ensure HRV remains high before sleep





# Weekly Metabolic Tracking Checklist

Day	Focus	Key Actions	Notes
Monday	Baseline Metabolic Testing	Track fasting glucose & Lumen trends	
Tuesday	VO2 Max & Workout Optimization	Perform VO2 max test, measure HRV pre/post workout	
Wednesday	Fasting & Fat Oxidation	Measure CGM trends during fasting & check ketones	
Thursday	Insulin Sensitivity & Carb Refeed	Monitor CGM during carb refeed & HRV response	



# Tracking Checklists

## Checklist



### Daily Metabolic Tracking

**Checklist** – Helps you track CGM, Lumen, HRV, exercise, and recovery on a daily basis.

### Weekly Metabolic Tracking

**Checklist** – Guides you through a structured weekly biohacking routine, including metabolic testing, fasting, exercise optimization, and recovery.





# Metabolic Testing and Biometrics (RMR, VO2 Max, Insulin Sensitivity Tests)



## Why Metabolic Testing Matters

- Identifies **how efficiently the body burns calories and processes nutrients**.
- Helps tailor **nutrition and exercise strategies** for improved metabolic health.

## Common Metabolic Tests

Test	Function
Resting Metabolic Rate (RMR) Test	Measures calorie burn at rest
VO2 Max Test	Assesses aerobic capacity and metabolic efficiency
Insulin Sensitivity Test	Evaluates the body’s ability to use glucose effectively

### Key Takeaway:

Metabolic testing provides **quantifiable data** to create **personalized biohacking strategies**.



# Red Light Therapy (Photobiomodulation) for Mitochondrial Efficiency



## Key Takeaway:

Red light therapy improves **cellular energy production** and **metabolic efficiency**.

## How Red Light Therapy Works

- Uses **low-level wavelengths of red and near-infrared (NIR) light** to **stimulate mitochondria**.
- Increases **ATP production** and **reduces oxidative stress**.

## Metabolic Benefits

- Enhances **mitochondrial function** for better energy metabolism.
- Improves **cellular repair and recovery**.
- Supports **fat loss by activating brown adipose tissue (BAT)**.
- Reduces **inflammation and muscle soreness**.

## How to Use

- **Devices:** Joovv, Mito Red Light, PlatinumLED Therapy Lights.
- **Protocol:** 10-20 minutes per session, 3-5 times per week.





What is Biofeedback?

- Uses **real-time monitoring** of physiological signals to improve **stress resilience and metabolic efficiency**.

How HRV Training Optimizes Metabolism

- **Heart Rate Variability (HRV)** reflects the balance between **sympathetic (fight-or-flight)** and **parasympathetic (rest-digest)** nervous systems.
- Higher HRV = **better metabolic flexibility and recovery**.

HRV Biohacking Tools

Device	Function
WHOOP Strap	Tracks HRV and recovery levels
Elite HRV App	Provides real-time HRV training
Muse Headband	Monitors brain activity and promotes mindfulness

HRV Training Methods

- **Breathwork (Coherent Breathing, Box Breathing).**
- **Cold exposure and sauna therapy.**
- **Meditation and mindfulness practices.**

Key Takeaway:

HRV biofeedback helps regulate **stress, metabolism, and recovery** for optimal health.





Why Genetic Testing Matters for Metabolism

- **Identifies genetic predispositions** for nutrient metabolism, fat storage, and exercise response.
- Helps **personalize dietary and fitness strategies** based on DNA.

Key Genetic Markers for Metabolic Health

Gene	Function
FTO (Fat Mass and Obesity-Associated Gene)	Influences fat storage and appetite
PPARG (Peroxisome Proliferator-Activated Receptor Gamma)	Affects insulin sensitivity and fat metabolism
MTHFR (Methylenetetrahydrofolate Reductase)	Impacts folate metabolism and detox pathways
UCP1 (Uncoupling Protein 1)	Regulates thermogenesis and fat burning

Popular Genetic Testing Services

- 23andMe
- DNAtfit
- SelfDecode
- Genoplate

Key Takeaway:

Genetic testing allows for **highly personalized metabolic biohacking** based on DNA.







# Conclusion

## Key Takeaways

- **Wearable devices track metabolic responses**, optimizing diet and lifestyle.
- **Metabolic testing provides data-driven insights** for nutrition and exercise.
- **Red light therapy enhances mitochondrial function**, supporting energy metabolism.
- **HRV biofeedback helps regulate metabolic control**, improving stress resilience.
- **Genetic testing personalizes metabolic biohacking**, allowing for targeted interventions.





# METABOLIC RESET

## Designing a Personalized Metabolic Biohacking Plan

This module will guide you through the **step-by-step process of developing a personalized metabolic biohacking plan** based on metabolic types, tracking tools, and ethical considerations.





Metabolic Reset

Designing a Personalized Metabolic Biohacking Plan

Step 1: Case Study Analysis of Different Metabolic Types

Before designing a biohacking plan, it’s essential to understand **different metabolic types** and how they respond to diet, exercise, fasting, and environmental stimuli.

Common Metabolic Types & Their Characteristics

Metabolic Type	Key Traits	Challenges	Best Biohacking Strategies
Carb Burner (Glucose Dependent)	Prefers carbs for energy, frequent hunger, post-meal crashes	Blood sugar fluctuations, insulin resistance	Low-glycemic diet, carb cycling, metabolic flexibility training
Fat Burner (Ketogenic Adaptive)	Efficient fat oxidation, steady energy levels, mental clarity	Difficulty with high-carb meals, low glycogen reserves	Targeted carb intake, cyclical ketosis, fasting strategies
Slow Metabolism (Metabolic Dysfunction)	Gains weight easily, fatigue, insulin resistance	Poor mitochondrial efficiency, high fasting glucose	Strength training, red light therapy, mitochondrial support (CoQ10, NAD+)
Fast Metabolism (Hyper Metabolic)	High energy, rapid calorie burning, struggles to gain weight	Nutrient deficiencies, muscle loss	Frequent meals, strength training, metabolic testing
Metabolic Flexible (Optimal Balance)	Efficiently switches between carbs and fats for fuel	None (ideal state)	Maintain metabolic flexibility with fasting, diverse diet, strength training

# Designing a Personalized Metabolic Biohacking Plan

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## Case Study 1: High Blood Sugar & Poor Fat Oxidation

**Patient Profile:** 38-year-old male, sedentary, BMI: 30, fasting glucose: 110 mg/dL

**Symptoms:** Post-meal energy crashes, slow weight loss, poor sleep.

**CGM Data:** Frequent glucose spikes >140 mg/dL, remains high overnight.

### Strategy:

- ✓ Improve **insulin sensitivity** with intermittent fasting.
- ✓ Switch to **low-glycemic, high-protein meals**.
- ✓ Use **post-meal walks** to regulate glucose.
- ✓ Introduce **strength training** to boost metabolism.



# Designing a Personalized Metabolic Biohacking Plan

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## Case Study 2: Poor Recovery & Low Energy

**Patient Profile:** 29-year-old female, active, BMI: 22, HRV: 50ms (low).

**Symptoms:** Waking up tired, poor exercise recovery, hormonal imbalance.

**HRV Data:** Low recovery, high cortisol levels.

### Strategy:

- ✓ Optimize **sleep routine & HRV tracking** (WHOOP/Oura).
- ✓ Use **red light therapy** for **mitochondrial support**.
- ✓ Reduce fasting duration to avoid stress overload.
- ✓ Prioritize **nutrient-dense foods** (magnesium, omega-3s, B vitamins).



# Designing a Personalized Metabolic Biohacking Plan



## Case Study 3: 52-Year-Old Woman – Perimenopause, Slower Metabolism, and Fatigue

### Patient Profile

- **Age:** 52
- **Gender:** Female
- **Body Type:** Moderate weight gain around the midsection
- **Symptoms:**
  - Slower metabolism and weight gain despite exercise
  - Poor sleep, night sweats, and hormonal fluctuations
  - Fatigue, brain fog, and low energy
  - Glucose spikes and crashes after meals





# Designing a Personalized Metabolic Biohacking Plan



Metabolic Data & Tracking Insights

Tool Used	Findings
CGM (NutriSense, Levels)	Post-meal glucose spikes <b>above 150 mg/dL</b> , indicating insulin resistance. Overnight glucose fluctuates.
Lumen (Fat vs. Carb Burn)	Morning readings indicate <b>carb-burning dominance</b> , suggesting metabolic inflexibility.
HRV Tracking (WHOOP, Oura Ring)	Low HRV (~30ms), indicating <b>chronic stress and poor recovery</b> .
VO2 Max Test	Lower-than-average oxygen efficiency, showing <b>reduced mitochondrial function</b> .



# Designing a Personalized Metabolic Biohacking Plan



## Metabolic Challenges

### 1. Perimenopause & Insulin Resistance

- Declining **estrogen and progesterone** levels impact **insulin sensitivity**, increasing belly fat storage.
- **Slower glucose clearance** from the bloodstream leads to **higher post-meal spikes**.

### 2. Fatigue & Poor Sleep Quality

- **Lower melatonin levels** → Poor sleep, contributing to **higher fasting glucose** in the morning.
- **High cortisol from stress** → Further disrupts metabolic function.

### 3. Slower Fat Oxidation & Mitochondrial Aging

- **Reduced mitochondrial efficiency** makes fat-burning **less effective**.
- **Lower VO2 max** suggests **suboptimal oxygen utilization**, leading to **sluggish energy production**.





# Designing a Personalized Metabolic Biohacking Plan



Personalized Metabolic Biohacking Plan  
Phase 1: Stabilizing Blood Sugar & Reducing Insulin Resistance

Strategy	Details
Meal Composition	Increase <b>protein intake (30g per meal)</b> to stabilize glucose. Pair carbs with fiber and fats to prevent glucose spikes.
Intermittent Fasting (IF)	Start with <b>12:12 fasting</b> (not too aggressive due to hormonal sensitivity). Increase to <b>14:10</b> over 3 weeks.
Carb Cycling	Increase carbs <b>on workout days</b> (for muscle recovery) and reduce carbs <b>on rest days</b> .
CGM Monitoring	Avoid glucose spikes <b>above 140 mg/dL</b> by modifying meals.
Post-Meal Walks	10-15 min after meals to <b>enhance glucose clearance</b> .



# Designing a Personalized Metabolic Biohacking Plan



Phase 2: Enhancing Mitochondrial Function & Fat Oxidation

Strategy	Details
Mitochondrial Supplements	CoQ10, PQQ, NAD+, and Magnesium for cellular energy.
Red Light Therapy	10-15 min <b>morning sessions</b> to improve mitochondrial ATP production.
VO2 Max Optimization	Introduce <b>low-intensity steady-state cardio (LISS)</b> to enhance oxygen utilization.
Lumen Tracking	Shift from <b>carb-burning to fat-burning mode</b> by fine-tuning macros and fasting windows.







Phase 3: Hormonal & Sleep Optimization

Strategy	Details
Hormone Balance	Consider <b>adaptogens (Ashwagandha, Rhodiola)</b> to regulate cortisol.
Sleep Tracking	Use <b>Oura Ring to optimize sleep quality</b> . Aim for <b>consistent bedtime &amp; 7-9 hours of sleep</b> .
Evening Routine	Use <b>magnesium + glycine supplements</b> and <b>blue light blockers</b> to enhance melatonin production.



# Designing a Personalized Metabolic Biohacking Plan



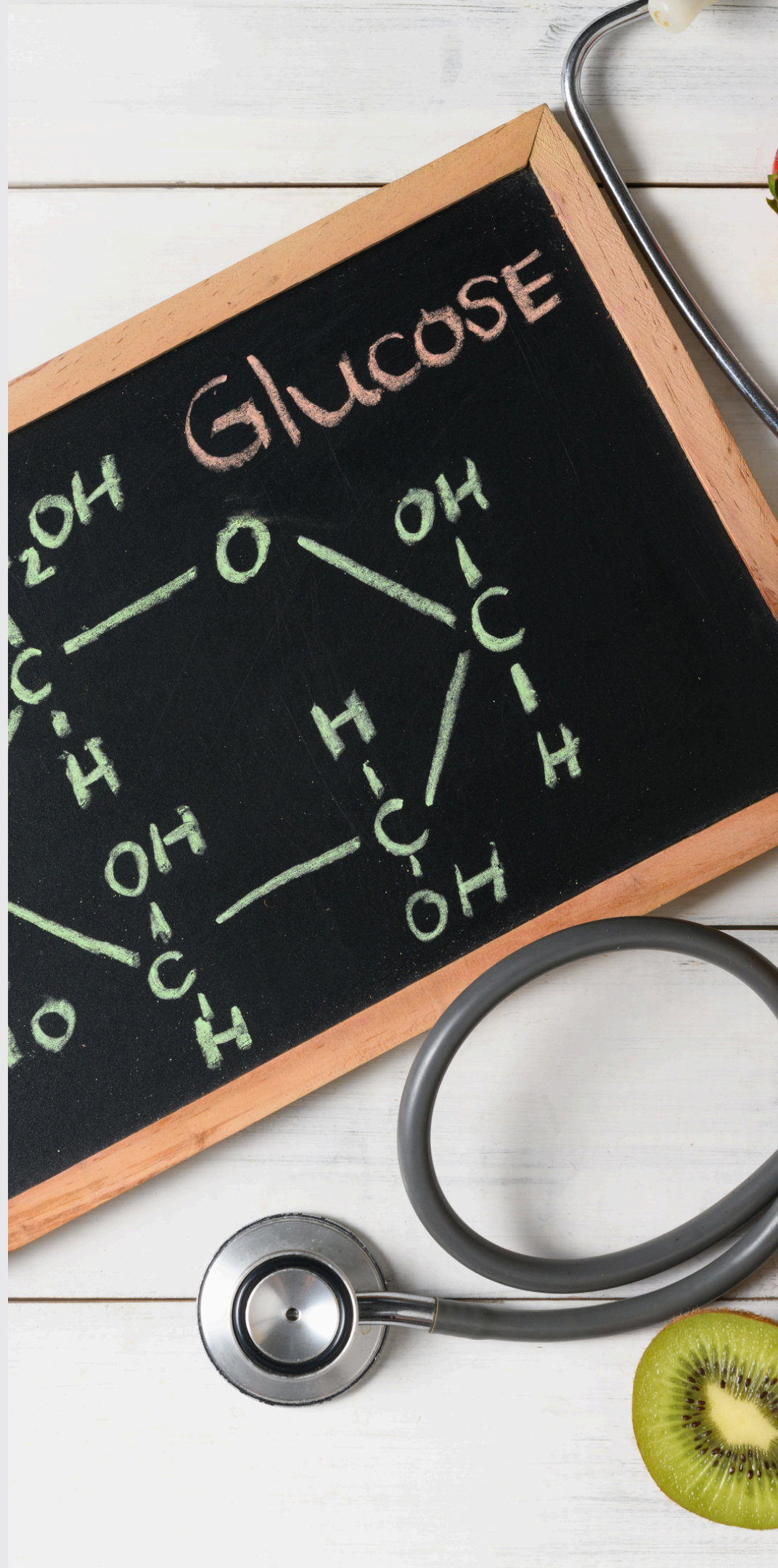
Tracking Progress & Adjusting Protocols

Week	Focus	Adjustments Based on Data
Week 1	Establish Baseline	Monitor CGM, HRV, and Lumen readings. Identify glucose response to meals.
Week 2	Adjust Macronutrients	Reduce high-glycemic carbs, increase protein. Introduce targeted fasting.
Week 3	Improve Exercise & Recovery	Add strength training + low-intensity cardio. Track HRV and adjust workouts accordingly.
Week 4	Fine-Tune & Sustain	Monitor long-term data trends. Ensure glucose stays stable overnight.





# Designing a Personalized Metabolic Biohacking Plan



## Expected Outcomes

- **Better glucose control** → More sustained energy throughout the day.
- **Improved fat oxidation** → Shift from carb-burning to fat-burning metabolism.
- **Enhanced sleep quality** → More stable **HRV & cortisol balance**.
- **Sustained weight management** → More **muscle retention, less fat gain**.



# Designing a Personalized Metabolic Biohacking Plan



Summary: Metabolic Biohacking Plan for a 52-Year-Old Woman

Focus Area	Optimized Biohacking Strategy
Blood Sugar & Insulin Sensitivity	Reduce post-meal glucose spikes with meal timing & post-meal walks.
Mitochondrial Support	Use <b>CoQ10</b> , <b>PQQ</b> , <b>NAD+</b> , and red light therapy.
Fat Burning & Energy	Track Lumen data, adjust fasting & carb cycling.
Exercise Optimization	Strength training 3x/week, steady-state cardio 2x/week.
Sleep & Recovery	Improve melatonin production with magnesium & blue light blocking.





## Metabolic Reset

# Designing a Personalized Metabolic Biohacking Plan



## Step 2: Creating Personalized Metabolic Biohacking Strategies

Now that we've identified **different metabolic types**, let's design a custom protocol.

### Key Factors to Consider

1. **Macronutrient Balance:** Should the focus be on **fat-burning or carb adaptation**?
2. **Fasting & Meal Timing:** How does fasting affect glucose stability & energy levels?
3. **Exercise Selection:** What type of training enhances **metabolic function**?
4. **Recovery Optimization:** Does stress impact glucose levels or HRV?
5. **Technology Use:** How will **CGM, Lumen, HRV, VO2 max** guide biohacking adjustments?

# Designing a Personalized Metabolic Biohacking Plan



Step 2: Creating Personalized Metabolic Biohacking Strategies  
Example: Personalized Biohacking Plan for a Fat Burner

Category	Strategy
Diet	Low-carb, high-fat (60% fat, 30% protein, 10% carbs)
Fasting	16:8 IF, carb refeed every 3 days
Exercise	HIIT (2x per week), Strength Training (3x per week)
Recovery	8 hours sleep, sauna therapy
Supplements	Berberine (glucose control), Creatine (energy), CoQ10 (mitochondria)
Tracking	CGM for glucose trends, HRV monitor for recovery





# Designing a Personalized Metabolic Biohacking Plan



## Step 3: Tracking Progress & Adjusting Protocols

The key to **effective metabolic biohacking** is **tracking and modifying strategies** based on real-time data.

### What to Track?

Tool	Metric Tracked	Adjustment Strategy
CGM (NutriSense, Levels)	Glucose fluctuations & fasting impact	Adjust carb intake & meal timing
Lumen	Carb vs. fat burning	Optimize macronutrient intake
HRV (WHOOP, Oura)	Stress & recovery trends	Adjust fasting & exercise intensity
VO2 Max	Oxygen efficiency & endurance	Improve metabolic flexibility
Biosense (Ketones)	Fat oxidation level	Validate ketosis & fasting effectiveness



# Designing a Personalized Metabolic Biohacking Plan



## Step 4: Ethical Considerations & Safety Precautions

### Ethical Concerns in Metabolic Biohacking

1. **Data Privacy:** Wearable devices collect **sensitive health data** – ensure HIPAA/GDPR compliance.
2. **Safe Supplementation:** Biohacking should be **scientifically backed & clinically safe**.
3. **Avoiding Extremes:**
  - Over-fasting can **increase cortisol & slow metabolism**.
  - Excessive caloric restriction **can lead to metabolic damage**.
4. **Customization Over Generalization:** Biohacking is **individualized** – avoid **one-size-fits-all** approaches.

### Safety Precautions

- ✓ **Monitor metabolic responses carefully** – Adjust fasting & exercise intensity based on glucose, HRV, and ketone levels.
- ✓ **Avoid long-term extreme keto or fasting without refeeding** – Prevents thyroid & hormonal imbalances.
- ✓ **Consult professionals before implementing aggressive metabolic changes.**





# Designing a Personalized Metabolic Biohacking Plan



## Step 5: Final Assessment – Develop a 4-Week Metabolic Biohacking Plan

### Step-by-Step Guide to Creating a 4-Week Plan

1. **Identify your metabolic type** (Carb Burner, Fat Burner, Slow Metabolism, Fast Metabolism).
2. **Set specific goals** (Fat loss, muscle gain, energy optimization).
3. **Choose a core biohacking strategy** (Fasting, Exercise, Mitochondrial Support, HRV Monitoring).
4. **Plan daily & weekly tracking** using CGM, Lumen, HRV, VO2 max.
5. **Adjust based on data trends** – Make small changes weekly based on metabolic feedback.

# Designing a Personalized Metabolic Biohacking Plan



Step 5: Final Assessment – Develop a 4-Week Metabolic Biohacking Plan

Template: 4-Week Metabolic Biohacking Plan

Week	Focus	Strategy	Tracking Metrics
Week 1	Baseline Assessment	Track CGM, HRV, VO2 max	Establish normal metabolic patterns
Week 2	Nutrient Optimization	Adjust carbs/fats based on Lumen & CGM	Reduce glucose spikes & improve fat oxidation
Week 3	Exercise & Recovery	Implement HIIT & HRV monitoring	Prevent overtraining & optimize performance
Week 4	Fine-Tuning & Adjustments	Modify fasting & meal timing	Ensure metabolic flexibility & long-term sustainability





# Designing a Personalized Metabolic Biohacking Plan



### Summary of Key Takeaways

- **Metabolic biohacking is individualized** – No one-size-fits-all solution.
- **Tracking tools (CGM, Lumen, HRV) provide real-time insights** to optimize fasting, exercise, and diet.
- **A 4-week structured approach allows for data-driven adjustments.**
- **Ethical considerations and safety precautions must be prioritized.**



Metabolic Reset

# Personalized 4-Week Metabolic Biohacking Plan



## Introduction

This 4-week metabolic biohacking plan is designed to improve **metabolic flexibility**, optimize **fat oxidation**, regulate **glucose levels**, and enhance **mitochondrial function**.

The plan integrates **diet**, **fasting**, **exercise**, **recovery**, and **technology** to track progress and make necessary adjustments.





# Personalized 4-Week Metabolic Biohacking Plan



## 4 Week Plan Overview

### Week 1: Baseline Assessment & Metabolic Tracking

- Track **CGM, HRV, and Lumen** readings to establish a metabolic baseline.
- Identify **glucose response** to meals, fasting, and workouts.

### Week 2: Optimizing Nutrients & Glucose Control

- Reduce **high-glycemic carbs** and increase **protein intake**.
- Optimize **fasting windows** based on CGM data.
- Enhance **insulin sensitivity** with targeted diet adjustments.

### Week 3: Exercise & Metabolic Flexibility

- Strength training (**3x/week**), HIIT (**2x/week**), and **steady-state cardio**.
- Monitor **Lumen for fat oxidation** shifts and adjust workouts accordingly.

### Week 4: Recovery, Stress Management & Long-Term Adaptation

- Improve **sleep quality** and **stress reduction** using **red light therapy** and **HRV tracking**.
- Optimize **mitochondrial health** for sustained metabolic function.





# Metabolic Reset Personalized 4-Week Metabolic Biohacking Plan



## Detailed Weekly Strategy

### Week 1 - Baseline Tracking

- ✓ Wear a **CGM (Continuous Glucose Monitor)** to identify glucose fluctuations.
- ✓ Use **Lumen** to track **fat vs. carb metabolism** daily.
- ✓ Measure **HRV (Heart Rate Variability)** for stress and recovery monitoring.
- ✓ Maintain **current diet** (no drastic changes) for accurate baseline tracking.

### Week 2 - Nutritional Optimization

- ✓ Reduce **refined carbs & high-glycemic foods** to stabilize blood sugar.
- ✓ Introduce **12-14 hour intermittent fasting** (adjust based on CGM responses).
- ✓ Increase **protein intake (30g per meal)** for metabolic boost.
- ✓ Monitor **post-meal glucose responses** and adjust meals accordingly.

### Week 3 - Exercise & Metabolic Flexibility

- ✓ Add **strength training (3x/week)** for muscle & metabolic support.
- ✓ Use **HIIT (2x/week)** to improve **insulin sensitivity**.
- ✓ Track **CGM response post-exercise** to fine-tune workouts.
- ✓ Use **Lumen before/after workouts** to adjust fat/carb burning.

### Week 4 - Recovery & Long-Term Adaptation

- ✓ Prioritize **sleep (7-9 hours)** with **HRV tracking & red light therapy**.
- ✓ Use **breathwork, meditation** to **lower cortisol & stress levels**.
- ✓ Support **mitochondria** with **CoQ10, PQQ, NAD+, sauna therapy**.
- ✓ Evaluate **CGM, Lumen, HRV data** for long-term metabolic adjustments.





## Metabolic Reset

# Personalized 4-Week Metabolic Biohacking Plan



## Tracking & Adjustments

Throughout this **4-week biohacking program**, track **metabolic markers** and adjust strategies accordingly.

## Key Tracking Tools & Adjustments

### ✓ CGM (Continuous Glucose Monitor)

- Monitor glucose fluctuations in response to **fasting & meals**.
- Adjust **meal timing & carb intake** to reduce glucose spikes.

### ✓ Lumen (Breath Analyzer for Metabolism)

- Check **daily fat vs. carb oxidation** to adjust macro intake.

### ✓ HRV Tracking (WHOOP/Oura Ring)

- Optimize **stress response** and **recovery capacity**.

### ✓ Exercise Performance Tracking

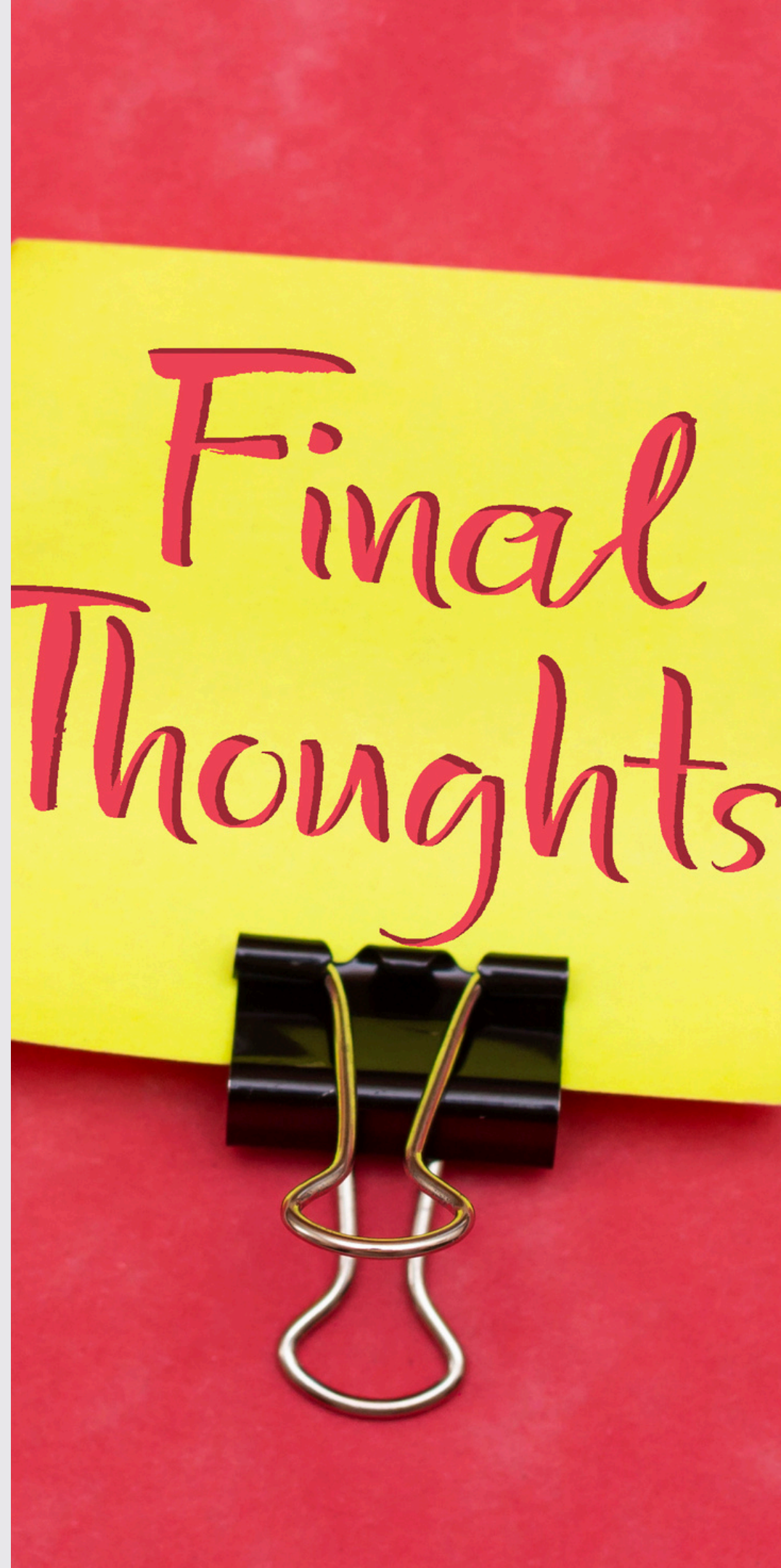
- Adjust **workout intensity & timing** based on glucose/HRV feedback.





# Personalized 4-Week Metabolic Biohacking Plan

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### Final Notes & Recommendations

- **Metabolism is adaptable**, so **frequent adjustments** are necessary.
- Use **technology** (CGM, Lumen, **HRV**) for **data-driven decisions**.
- Maintain a **balance between diet, exercise, fasting, and recovery**.
- Prioritize **sustainable long-term metabolic health** over quick fixes.

### End of Plan

This **4-week biohacking plan** is designed for **personalized metabolic optimization** and **long-term health improvements**. See the CSV Biohacker Tracker



Metabolic Reset

Thank You

