

# *Let's talk about health*

## **Healthy Weight Loss**



A SPECIAL COLLECTION

REALIZANT

# Introduction

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Welcome to a journey that combines science, well-being, and motivation: "Let's Get Healthy – Healthy Weight Loss". In this e-book, you will find a clear and accessible guide that demystifies the fundamental concepts of healthy weight loss, helping you turn goals into sustainable results.

Throughout the opening pages, we will explore the theoretical foundations that support the weight-loss process, from setting realistic goals to understanding the factors that influence metabolism. This solid foundation will enable you to make informed decisions, aligning expectations with practices that respect your body.

Next, we will dive into the biological bases that govern energy balance, addressing how hormones, genetics, and daily habits interact in the pursuit of a healthy weight. By understanding these mechanisms, you will gain confidence to adopt personalized and effective strategies. Let's together turn knowledge into action and achieve a lighter, fuller life – are you ready for the next step?

# Summary

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# Introduction and Concepts

## Let's Talk Health – Healthy Weight Loss: Introduction and Concepts

Healthy weight loss is not just about “losing weight quickly” or following fad diets. It is an integrated process that involves metabolic, behavioral, and environmental changes, always respecting individual physiology. In this section, we present the scientific foundations that support sustainable body-mass loss, highlighting the main concepts that every health professional and the reader themselves need to master in order to apply effective and safe strategies.

### 1. Energy balance: the starting point

The basic principle of weight loss lies in a calorie deficit, i.e., consuming fewer calories (kcal) than the body expends. However, the simple “calories consumed minus calories burned” equation is insufficient to guarantee lasting results. It is necessary to consider:

- **Basal Metabolic Rate (BMR)**: energy required to maintain vital functions at rest. It varies according to age, sex, lean mass, and genetics.
- **Thermic Effect of Food (TEF)**: energy expenditure associated with digestion, absorption, and metabolism of nutrients ( $\approx 10\%$  of ingested kcal).
- **Physical Activity Expenditure (PAE)**: energy used in planned exercise and everyday activities (NEAT – Non-Exercise Activity Thermogenesis).
- **Adaptive thermogenesis**: the body’s response to prolonged deficits, which can lower BMR and make weight loss harder.

When planning a weight-loss program, the goal is to create a moderate deficit ( $\approx 10-20\%$  of TDEE – Total Daily Energy Expenditure), enough to promote fat loss without triggering excessive adaptive thermogenesis.

### 2. Diet quality: beyond calories

Counting calories is not enough; the macronutrient composition and nutritional density of foods directly influence satiety, glycemic control, and lean-mass preservation.

- **Proteins**: 1.6-2.2 g/kg body weight per day favor lean-mass maintenance and increase satiety. High-biological-value foods (lean meats, eggs, dairy, legumes) are essential.

- **Carbohydrates:** prioritize low-glycemic-index sources (whole grains, tubers, fiber-rich fruits) to control insulin response, reducing lipogenesis.
- **Fats:** focus on mono- and poly-unsaturated fatty acids (olive oil, nuts, omega-3-rich fish) that modulate inflammation and improve insulin sensitivity.
- **Dietary fiber:** >25 g/day enhances satiety, regulates bowel transit, and modulates the microbiome, positively impacting energy metabolism.

A healthy eating plan should have *low energy density* (many nutrients per few calories) and *high nutrient density* (vitamins, minerals, phytochemicals). This encourages larger food volumes with lower caloric load.

### 3. Practical portion-control strategies

- Use smaller plates (about 23 cm) to reduce the visually perceived amount.
- Apply the “palm rule”: a protein portion the size of the palm, a carbohydrate portion the size of a fist, and a fat portion the size of the thumb.
- Implement “intermittent fasting” (16/8 or 18/6) as a tool to reduce the number of meals and, consequently, total caloric intake, without compromising nutritional quality.
- Adopt “mindful eating”: chew slowly, eliminate distractions, and pay attention to satiety signals.

### 4. Hormonal role in weight regulation

Several hormones modulate appetite and energy expenditure. Understanding their function allows more targeted interventions.

- **Leptin:** produced by adipocytes, signals satiety to the hypothalamus. In obesity, leptin resistance reduces signaling effectiveness.
- **Ghrelin:** the hunger hormone, released mainly when the stomach is empty. Meals rich in protein and fiber lower ghrelin secretion.
- **Insulin:** controls glucose uptake. Chronic hyperinsulinemia favors fat storage; low-glycemic diets help improve sensitivity.
- **Peptide YY (PYY) and GLP-1:** intestinal hormones that increase satiety. Fiber- and protein-rich foods stimulate their release.

Maintaining stability of these hormones through regular meals, balanced macronutrients, and stress control (cortisol) is crucial to avoid “compensatory” eating episodes.

### 5. Physical activity: synergy between aerobic and resistance training

Exercise not only raises immediate calorie expenditure but also elevates post-exercise basal metabolism (EPOC – Excess Post-Exercise Oxygen Consumption) and preserves lean mass.

- **Aerobic training** (30-60 min, 3-5 times/week, moderate-to-high intensity) improves oxidative capacity, increases fat oxidation, and enhances insulin sensitivity.
- **Resistance training** (2-3 times/week, 8-12 repetitions, load that induces muscular fatigue) stimulates hypertrophy and lean-mass maintenance, essential for preserving BMR.
- **High-Intensity Interval Training (HIIT)** is effective for shortening workout time while keeping calorie burn high and boosting post-exercise metabolism.

Combining both exercise types maximizes fat loss and minimizes lean-mass loss, delivering a “leaner and stronger body.”

## 6. Psychological and behavioral aspects

Long-term success depends on habit change and emotional management. Proven strategies include:

- **Food logging** (paper diary or apps): raises self-awareness and helps identify consumption patterns.
- **Cognitive-behavioral therapy (CBT)**: restructures dysfunctional beliefs about food and body, reducing binge episodes.
- **SMART goals** (Specific, Measurable, Achievable, Relevant, Time-bound): facilitate monitoring and motivation.
- **Social support**: support groups, family, or health professionals increase adherence to the plan.

In addition, sleep quality ( $\geq 7$  h) influences leptin and ghrelin, and sleep deprivation is linked to increased appetite and reduced insulin sensitivity.

## 7. Monitoring and adjustments: the importance of continuous assessment

A healthy weight-loss program must be dynamic, based on objective data:

- **Weekly weighing** (not daily) to avoid short-term fluctuations and reduce anxiety.
- **Anthropometric measurements** (waist, hip, arm circumference) that reflect changes in body composition.
- **Bioimpedance or DEXA** (when available) to monitor lean-mass versus fat-mass ratios.

- **Re-evaluation of caloric intake** every 4-6 weeks, adjusting the deficit according to weight loss and the reduction in TDEE.

These metrics allow rapid identification of needed changes in the diet plan or exercise volume, preventing plateaus.

## 8. Sustainability: turning weight loss into a lifestyle

For weight loss to be lasting, the adopted changes must be viable over the long term. Key sustainability principles include:

- **Food flexibility:** incorporate “favorite” foods in controlled portions, avoiding feelings of deprivation.
- **Meal planning:** weekly batch cooking reduces reliance on ultra-processed options.
- **Pleasurable physical-activity routine:** choose activities that bring joy (dance, cycling, team sports) to increase adherence.
- **Ongoing nutrition education:** understanding labels, portions, and food impact on metabolism empowers individuals to make conscious decisions.

When weight loss ceases to be a “event” and becomes integrated into daily life, the likelihood of maintaining the ideal weight rises significantly.

In summary, healthy weight loss is based on a moderate energy deficit combined with a nutritionally dense diet, regular combined exercise, hormonal regulation, psychological support, and constant monitoring. By understanding and applying these concepts in an integrated way, health professionals and readers can achieve consistent, safe, and, above all, sustainable results over time.

# Biological Foundations

## Biological Foundations of Healthy Weight Loss

Weight loss is not merely a reduction of kilograms on the scale; it reflects complex adaptations across multiple physiological systems. To achieve sustainable and safe weight loss, it is essential to understand the biological mechanisms that regulate energy expenditure, energy storage, and hormonal signaling. This chapter addresses, in depth and with practical focus, the main processes involved and provides evidence-based guidelines for everyday application.

### 1. Energy balance: the law of thermodynamics applied to the human body

- **Caloric intake (CI):** represents the energy obtained from macronutrients (carbohydrates, proteins, and fats) and, to a lesser extent, from alcohol.
- **Total energy expenditure (TEE):** comprises three components:
  - *Basal Metabolic Rate (BMR)* – energy required to maintain vital functions at rest ( $\approx 60\text{-}70\%$  of TEE).
  - *Thermic effect of food (TEF)* – expenditure associated with digestion, absorption, and storage of nutrients ( $\approx 10\%$  of TEE).
  - *Physical activity (PA)* – variable expenditure that includes structured exercise and daily movements ( $\approx 20\text{-}30\%$  of TEE).
- To lose weight,  $CI < TEE$  must be maintained consistently, creating a caloric deficit that stimulates the mobilization of fat stores.

### 2. Macronutrient metabolism and its influence on satiety

- **Carbohydrates:** rapidly absorbed, raise blood glucose and stimulate insulin release. Insulin promotes glucose uptake in tissues and inhibits lipolysis. Choosing low-glycemic-index (GI) carbohydrates reduces insulin spikes and prolongs satiety.
- **Proteins:** have the highest thermic effect ( $\approx 20\text{-}30\%$  of ingested energy is dissipated as heat) and increase the release of satiety hormones such as cholecystokinin (CCK) and peptide YY (PYY). A recommendation of 1.2-1.6 g/kg body weight per day helps preserve lean mass during caloric restriction.
- **Fats:** are energy-dense (9 kcal/g) and influence leptin secretion, the hormone that signals the hypothalamus about energy-store availability. Monounsaturated and polyunsaturated (omega-3) fats improve insulin sensitivity and modulate inflammation.

### 3. Key hormones in body-weight regulation

- **Leptin:** produced by adipocytes, informs the brain about the level of fat reserves. In obese individuals, leptin resistance reduces its anorexigenic effectiveness.
- **Ghrelin:** orexigenic hormone secreted by the stomach during fasting. Elevated levels increase hunger; hypocaloric diets can raise ghrelin, making adherence more difficult.
- **Insulin:** regulates glucose transport and lipogenesis. Hyperinsulinemia favors accumulation of adipose tissue, especially visceral fat.
- **Cortisol:** stress hormone that, in excess, stimulates lipolysis in muscle tissue and promotes visceral fat deposition.
- **Thyroid hormones (T3/T4):** modulate basal metabolic rate. Deficiencies can lower energy expenditure and hinder weight loss.

### 4. Adaptive thermogenesis and “starvation mode”

When a caloric deficit is prolonged, the body activates energy-conservation mechanisms (adaptive thermogenesis). BMR can drop up to 10-15 % below predictions from equations such as Harris-Benedict. Strategies to mitigate this effect include:

- Maintain adequate protein intake to preserve lean mass.
- Include resistance training (weightlifting) 2-3 times per week, as muscle tissue has a higher BMR than fat.
- Use periodic “maintenance meals” (refeeds) every 2-3 weeks, temporarily increasing calories to restore leptin and thyroid hormones.
- Incorporate thermogenic foods (green tea, chili, coffee) that can modestly raise caloric expenditure.

### 5. Gut microbiota and its relationship with weight

Metagenomic studies show that microbiota composition influences the efficiency of energy extraction from food and the regulation of systemic inflammation. Practical findings:

- A microbiota profile rich in *Bacteroidetes* and low in *Firmicutes* is associated with a lower body-mass index (BMI).
- Foods high in soluble fiber (inulin, psyllium) promote production of short-chain fatty acids (SCFAs) that improve insulin sensitivity and increase PYY release.
- Probiotics containing *Lactobacillus* and *Bifidobacterium* may reduce intestinal inflammation and support weight loss when combined with a hypocaloric diet.

### 6. Practical strategies for daily application

- **Meal planning:** split caloric intake into 4-5 small meals, prioritizing lean protein (25-30 g) at each meal to maximize satiety and the thermic effect.
- **Macronutrient distribution:** 40-45% low-GI carbohydrates, 30-35% protein, and 25-30% healthy fats.
- **Alcohol intake control:** alcohol provides 7 kcal/g and can interfere with fat metabolism, reducing lipid oxidation rates by up to 30%.
- **Hybrid training:** combine 150-300 min of moderate aerobic exercise (cycling, walking) with 2-3 weekly strength-training sessions (3-4 sets of 8-12 reps).
- **Monitoring:** use bioimpedance devices or DXA to track body composition (lean mass vs. fat mass) every 4-6 weeks.
- **Sleep and stress management:** sleep 7-9 h per night and practice relaxation techniques (meditation, diaphragmatic breathing) to keep cortisol and ghrelin at favorable levels.

## 7. Considerations for specific populations

- **Elderly:** sarcopenia increases the risk of lean-mass loss during caloric restriction. Strategy: increase protein intake (1.5 g/kg) and emphasize strength training.
- **Women of reproductive age:** hormonal fluctuations (estrogen, progesterone) can affect water retention and appetite. Cyclical adjustments in carbohydrate intake may improve adherence.
- **Individuals with insulin resistance or pre-diabetes:** prioritize low-GI foods, increase omega-3 fatty-acid intake, and consider intermittent fasting (16/8) under clinical supervision.

By integrating these biological principles with consistent dietary and physical-activity practices, healthy weight loss becomes a physiologically aligned process rather than a short-term goal, reducing the risk of rebound and promoting long-term maintenance.

*Important:* the information presented in this chapter is educational and does not replace evaluation by a qualified health professional. Consult a physician, dietitian, or fitness educator before starting any weight-loss program, especially if you have pre-existing medical conditions.