Flexible dieting and metabolic adaptation during weight loss: a comprehensive review

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Background
Flexible dieting, or “if it fits your macros” (IIFTM), is a method of eating used in the fitness industry that is unlike popular fad diets. Societal influences like social media have promoted misconceptions about how to lose weight. The goal of this project is to learn about the mechanisms of flexible dieting and macronutrient tracking through creating a comprehensive resource targeting a fitness population. Flexible dieting is a unique method to eating that includes tracking and individualizing the three main macronutrients: carbohydrates, fats, and proteins in order to manipulate individual body composition and reach personalized health, fitness, and physique goals.

A secondary focus of this project is to explore the metabolic adaptations that occur during weight loss. In general, the body responds to a caloric deficit by undergoing many adaptations including adaptive thermogenesis, increased mitochondrial efficiency, and hormonal alterations that collectively function to decrease energy expenditure. Many people undergoing a dieting phase through a lower calorific diet experience weight plateaus as the body adapts to a lower caloric intake. The goal of this project is to learn about the characteristics that make up metabolic adaptation.

Findings
Choosing the “best” meal

The left picture represents a more nutrient-dense meal, while the right picture represents a more “fun” meal. Both meals equal to similar macronutrient breakdown; however, the left meal contains more micronutrients and fiber. Choose either meal and still reach your goals.

Components of Metabolism

Components of total daily energy expenditure (TDEE). TDEE = total daily energy expenditure; NEAT = non-exercise activity thermogenesis; TEF = thermic effect of food; RMR = basal metabolic rate; NREE = non-reducing energy expenditure. 2

- TDEE decreases more significantly than the degree of body mass, which is referred to as adaptive thermogenesis 3
- BMR decreases due to a reduction in metabolically active tissue. 5
- NREE is reduced because of a reduced total body mass and less effort required to move during physical activity. 5

Metabolic Adaptation

- Hormonal adaptations during weight loss:
  - Thyroid, leptin, insulin, and testosterone decrease. 5
  - T₄ level, body weight, and RMR are positively correlated. 1
  - Leptin, “the hunger hormone”, is secreted from fat cells. As the size of fat cells decrease, there is less leptin secretion. 4
  - Insulin regulates macronutrient metabolism and muscle protein breakdown. The smaller fat cells are more insulin sensitive and require less insulin to carry out the same metabolic role. 3
  - Testosterone may repress adipogenesis. 2
  - Ghrelin, the orexigenic hormone, increases during a period of calorie restriction and decreases in well-fed states. 2
  - Research shows these hormonal changes remain in this fashion during maintenance of a low body fat percentage even after the period of active weight loss has ended. 1

Discussion

Flexible Dieting
- Weight fluctuation is based on calories in versus calories out.
- Tracking macronutrients allows complete control over body composition by monitoring the body’s response to nutrients.
- Macronutrients:
  - Carbohydrates: 4 calories per gram
  - Proteins: 4 calories per gram
  - Fats: 9 calories per gram
- Simple carbohydrates versus complex carbohydrates:
  - Study shows no difference in body composition, lipids, or blood sugar when comparing two groups eating just simple carbs and just complex carbs, respectively.
- Track your macronutrients:
  - First determine total calories
  - Protein first = 1.4 to 2.0 g per kg of bodyweight
  - Fat second = 20 to 35% of daily caloric intake
  - Carbohydrates last = remaining calories from carbs

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  - Testosterone may repress adipogenesis.
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  - Research shows these hormonal changes remain in this fashion during maintenance of a low body fat percentage even after the period of active weight loss has ended.

References


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