

True Facts About Burning Calories

Ayesha Liaquat^{1*}, Kiran Fatima Nasir¹, Nimra Saeed¹, Muneeba Javed¹

¹National Institute of Food science and Technology, University of Agriculture Faisalabad, Pakistan

*Corresponding Author: aishaliaquat0@gmail.com

ABSTRACT

Burning calories encompass the measurement and understanding of energy expenditure, whether through the caloric content of food or the calories burned during physical activities. A well-balanced diet can certainly help in burning calories. A diet rich in protein, fiber, and unsaturated fats can provide a feeling of fullness and boost metabolism or burn excess calories. Exercise is widely recognized for burning calories. Various exercise modalities can effectively contribute to energy expenditure. Relying solely on exercise may lead to neglecting other opportunities such as non-exercise activity thermogenesis (NEAT) which is defined as energy expenditure by everything we do daily other than exercise. These may be beneficial for increasing energy expenditure. It is important to have a balanced perspective and consider all aspects of daily life that can contribute to calorie burning, not just formal exercise or diet.

Keywords: Energy expenditure, balanced diet, exercise, non-exercise activity thermogenesis

Introduction

If there is no burn out of the body calories or throughout the weight loss journey the main advice is to not exceed calories in over calories out. Both daily diet and physical exercise are key factors in keeping the body fit and healthy, and most of us think that it can be simply done by just joining the gym or following a specific diet. Exercise is effective in burning out excess calories but in some cases, it does not seem to shed a few pounds in weight despite its quantity and intensity which is commonly called exercise paradox. People are always hungry after doing exercise and as a result, they eat more than they need and gain weight instead of losing it. Extreme training in gyms or working out a lot does not appear to be more effective in calorie burning than a moderate form of activity done several days a week [1].

Regular exercises are certainly important for burning calories and maintaining a healthy weight, some other physical activities can also be beneficial, for example, daily activities such as household chores, yardwork, walking to work, or running errands can help burn calories. These activities are called non-exercise activity thermogenesis (NEAT). NEAT activities are important because they help the body to stay active throughout the day which can boost both your metabolism and burn more calories over time. NEAT can vary significantly among individuals mainly because of the differences in occupations and activities of leisure time. It can have an impact on overall energy balance and weight management [2].

Weight gain is a grave issue that appears when calorie intake is more than its output and those extra calories accumulate as fat in the body, contributing to many health problems. Exercise is highly beneficial in burning calories, which is a successful endeavor to increase energy, but it's not always the case. Exercise helps to burn a lot of calories at least in the beginning, but recent studies suggest that human metabolism is very dynamic and adaptive enabling the body to resist these exercises with less or no effect [3].

Effect of Diet on Burning Calories

Energy intake and expenditure are both linked to each other through a bidirectional causal relationship where they both dynamically affect each other. When there is less food intake then the body's total energy expenditure (TEE) decreases with reduced resting metabolic rate (RMR). Decreased food intake results in the reduction of diet-induced thermogenesis (DIT) and weight loss occurs. In the case of excessive calorie consumption, which typically results from hyperactivity, rigorous exercise, and through Coveting manipulation results in higher energy loss because renal sodium-dependent glucose reabsorption metabolism is inhibited. All these results in excess food intake which masks the increase in total energy expenditure (TEE) and decreases the rate of calories burned in the body [4].

Protein Effect on Calories Expenditure

Several studies suggest that macronutrients show unequal thermogenesis, particularly when considering an optimal diet, specifically designed for controlling weight. For example, on an isocaloric basis protein increases diet-induced thermogenesis (DIT)

more than other macronutrients. It is evident through evidence-based studies that a eucaloric diet with high protein content results in increasing DIT and favors the induction of negative energy balance in the body. High protein diets are also associated with a reduction in both resting metabolic rate and fat-free mass in a weight loss journey. It has been conclusively shown that similarly protein-rich diets are also more thermodynamically beneficial than other macronutrients for the same number of caloric intakes [4].

Effect of Exercise on Burning Calories

The main purpose of this article is to explain the misconception of the effect of different exercises on calorie consumption in the body. Three questions arise in this context:

1. How many calories does exercise burn?
2. Is fat-burning exercise effective to burn calories from fat?
3. Is it possible for a person to continue to burn more calories after exercise?

How many calories does exercise burn?

About a century ago, a method that combines Atwater's famous experiment with the use of a human calorimeter was used to calculate the energy consumed by exercising. Later, numerous graphs and tables illustrating the oxygen and calorie costs of other activities, including walking, playing, and even writing were demonstrated. These graphs aid in increasing accuracy in calculating the calorie output from various exercises. There is a common perception that about 62 kcal/km burn when an average-weight person walks or runs. For a person with a weight of about 180 pounds, some exercises such as walking at a rate of 4.83 km/hour burn 60 kcal/km, and in the case of jogging at 9.7 km/hour the calorie burning rate may be 81 kcal/km. So different exercises have different effects on calorie burning. Two assumptions arise from the above data to explain the effect of exercise on burning a substantial number of calories. First is the intensity along with the duration of exercises like if an overweight person weighs about 180 pounds, walking at a rate of about 4.83 km/hour for about 45 minutes he burns about 220 calories in each session. The second assumption says that the total calories burned through daily exercise are added to the daily energy output. For a female with a weight of 180 pounds, walking about 5.63 km/hour for 45 minutes, she burns about 243 kcal in comparison to when she walks about 6.44 km/hour to burn 288 kcal. The following table shows some of the exercises with their estimated calorie loss [5].

Activity	Calories burn (Kcal/min)	Time Min	Net Calories Expenditure (Kcal)
Lying	1.8	45	81
Sitting	2.4	45	108
Cooking	3.7	45	167
Walking	4.8	45	216

Are fat-burning exercises effective to burn calories from fat?

The respiratory exchange ratio has been widely used to determine the fat and carbohydrate metabolism contribution to various intensities of exercise. For activities ranging from low to moderate intensity, VO_{2max} is about 60% with a maximum heart rate of 65% can yield a 0.85 respiratory exchange ratio, and has an equal amount of both carbohydrate and fat metabolism. In comparison to activities in a range of high to moderate intensity, the ratio is 0.88 with 60% VO_{2max} having about 75% maximum heart rate which yields 40% fat and 60% carbohydrate metabolism. The baseline fitness level is important to determine whether both high or moderate-range exercises are possible for a sedentary, overweight, and obese person. Time plays a significant role in the fat-burning phenomenon. In the case of some exercises where total energy burn in the body is the central focal point and to do so, high-intensity activities are usually more effective because it burns more fat and total energy despite using a lower percentage of fat [5].

Is it possible for a person to continue burning calories after exercise?

The idea of burning calories even after the exercise is old, as it is evident from the data that athletes who are engaged in prolonged exhaustive exercise usually have a high metabolic rate for about 24 hours after completing any high-intensity exercise. Excess Post-exercise Oxygen Consumption (EPOC) is an emerging trend with various intensities and modes of exercise. Walking, running, cycling, or weight training are considered modes of exercise at high, moderate, and low intensity. EPOC is a part of different modes of exercise including continuous, interval, or intermittent activities. From studies, it is suggested that the energy cost for excess post-exercise oxygen consumption (EPOC) is 5-10 kcal for light, for moderate activity, it is 12.5 to 35 kcal, and 180 kcal after an exhaustive exercise of high intensity. So, calories always burn even after exercise depending on the intensity of different modes of exercise [5].

Misunderstandings About Burning Calories

- 1. Underestimation of burning calories:** Most people underestimate the calories burned through daily work like gardening, cleaning, and doing home chores. As they considered these to be normal routine work, but these jobs contribute a lot in burning calories in the body, but only in the beginning as the human body is dynamic or adaptive so these activities will no longer be significant in excess calories loss as human bodies are used to it [2].
- 2. Ignoring slight changes:** In most cases, slight changes like taking the stairs instead of using the elevator or going to work by walking instead of driving contribute a lot to calories burned with time. At first, they are insignificant, but these changes are highly effective.
- 3. Neglecting certain lifestyle choices:** Many lifestyle choices which include maintaining good posture, fidgeting, or using a standing desk can also increase calorie burning, but these factors are often overlooked.
- 4. Overemphasizing exercise:** Exercise is an essential component of calorie expenditure as they contribute a lot, but it is also important to remember that some non-exercise activities like doing household chores (cleaning, cooking, and laundry), standing, or pacing while talking on the phone, and dancing can also be useful and effective [1].
- 5. The dietary pattern:** As protein-rich diets are more important for calorie burning but relying solely on protein for maintaining a perfect slim body is not good as these may result in other essential nutrient deficiencies or ultimately contribute to malnutrition.

Conclusion

The human body burns calories from food during different physiological activities and functions like breathing, circulation, and cell production through several mechanisms. Basal metabolic rate (BMR) accounts for most calories burned and these body metabolism or body weight homeostasis both are altered when energy intake does not equal energy expenditure. Physical activities or diet are contributing factors in burning calories. Besides some other activities like non-exercise activity thermogenesis which are activities that burn calories in the body other than sleeping, eating, and intentional

exercise. Increasing NEAT by incorporating more physical activity into daily routines can help burn additional calories and support weight loss or weight maintenance.

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