

Energy Requirements to Maintain Body Weight-Sports

Determining adequate caloric intake to maintain body weight depends primarily on resting metabolic rate and activity level. Furthermore, energy cost also depends on the amount of lean body mass, intensity of exercise, and cardiorespiratory efficiency. Specifically, in two individuals with the same body weight, the individual with the greater proportion of lean body mass would possess a higher resting energy expenditure. Moreover, as intensity of exercise increases, energy cost does also. These factors must be considered before determining an appropriate caloric intake, training program, and macronutrient (carbohydrate, protein, and fat) ratio.

Ensuring proper nutrient intake should be reflected through optimal health and athletic performance, and maintenance of body mass and composition. An undesired gain or loss of body weight, adverse changes in body composition, or poor exercise or sports performance all indicate potentially inappropriate caloric intake.

Only rough estimates of daily caloric cost can be made because it is impractical for all athletes and fitness enthusiasts to use sophisticated methods of determining energy expenditure (i.e., activity monitors, calorimetry). Furthermore, daily energy requirements may vary depending on exercise intensity and other less understood factors, such as fluctuations in hormonal levels, especially in females. Regardless of the procedure used to determine daily energy expenditure, a consistent and reliable method for monitoring body weight and composition (accurately calibrated weigh scales, underwater weighing, skinfold calipers, etc.) should be used on a regular basis to assess the effects of a combined nutrition and training program. Thus, involuntary changes in weight and/or composition would signal the need for dietary alterations.

Determining resting energy expenditure (REE) can be ascertained from the equations listed in. Furthermore, because fat is considerably less metabolically active than muscle, individuals with greater lean body mass (all bodily constituents except fat) would possess relatively higher resting energy expenditures. This lower metabolism occurs primarily because women, in general, possess more body fat than do men of similar size. Consequently, as activity level and lean body mass (LBM) vary among individuals, total daily energy expenditure does as well.

For an average person, this sum comprises approximately 60-75% of the daily energy expenditure. The remaining energy consumption includes the thermic effect of food intake, which comprises approximately 5-10% of energy intake and the thermic effect of physical activity, which constitutes roughly 15-30%.¹ Accordingly, the energy allowance for athletes may range between approximately 1.6 to 2.4 X REE.

Energy requirements vary extensively depending on the volume of daily activity, particularly among athletes. Economos et al. recommend, as a general guideline, that male athletes consume at least 50 kcal/kg/day and females consume approximately 45 to 50 kcal/kg/day when training for more than 90 minutes daily. Based on these estimates, a 50-kg (242-lb.) football player training for 1.5 hours daily would require over 5500 kcal daily, whereas a 50-kg female tennis player training for the same duration would require approximately 2350 kcal/day.

Accounting for intensity of exercise also greatly influences daily energy intake. Obviously, an individual who walks for 60 minutes will expend considerably less energy than if he/she were to undergo a more intense activity, such as jogging, for the same duration. But even among athletes who train consistently for a given sport, energy consumption can vary drastically on a daily basis. For example, a triathlete undergoing a particularly difficult training session may expend as much as 2000 kcal in a workout, whereas in a session of lesser intensity expends only 1000 kcal.

As an approximate guide. In turn, daily energy expenditure can then be calculated by using determinations of resting metabolic rate. As an example, a 25-year-old, 70-kg (154-lb.) male would possess a resting energy expenditure of 1750 kcal/day $[(15.3 \times 70 \text{ kg}) + 679]$. Adding 20% to the REE to account for the thermic effect of physical activity brings the total to 2100 kcal. Accounting for the thermic effect of food consumption adds an additional 90 kcal (5% of REE). Finally, if he engages in running at a pace of 8 min/mile for 30 minutes, he would expend approximately 437 kcal $(70 \text{ kg} \times .208 \times 30 \text{ min})$. Therefore, the sum total for daily energy expenditure for this individual is approximately 2627 kcal/day

Of course, vigorous daily activities (i.e., strenuous labor) could potentially increase the daily energy expenditure. Also, lean body mass was not counted in the preceding calculation, which can radically alter expenditure calculations. Perhaps a more accurate method of estimating energy expenditure would involve determining macronutrient requirements and ratios that are based on resting metabolism, activity level, and lean body mass. Such methods will be addressed in subsequent sections, and will use protein, carbohydrate, and fat requirements of various athletic pursuits. Regardless of the calculations made, however, an appropriate dietary strategy is one that balances energy intake and expenditure, which will ultimately maintain body weight and composition.

About the Author

Author has an experience of more than 4 years writing about [supplements guide](#). He also holds experience writing about [bad effects of creatine](#) and [bodybuilding diet](#).

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