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## Editorial

# Diet and physical activities: Knowledge of energy balance

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Diet and exercises always go hand in hand for fitness. One way to get energy is through food, and another way to spend energy by physical activities. In both cases, the unit remains the same: kilo calories (kcal) or kilo Jules (kJ). Kcal and Calories are used interchangeably, which denotes the same amount of energy. In science, one calorie (kcal) equals 4.18 kJ. The USA, and Canada, typically use calories on the packaging of the food products, whereas European Union, Australia, and New Zealand use both kcal or KJ. China follows specifically KJ and India kcal (calories).

In a balanced diet, the primary nutrients are carbohydrates, protein, fat, and vitamins, minerals as micronutrients should be present proportionately that produce energy altogether. The energy is used as fuel for the body to perform all metabolic functions and control temperature. The body size and composition also depend on energy at every stage of an individual and vice versa. Therefore, food intake (input) and physical activities (output) are equally important to balance energy in the human body. The need for energy is undoubtedly more from childhood till adolescence and during the period of

pregnancy and lactation. Carbohydrates, protein, and fat all produce energy in the body, but protein is used daily for metabolism rather than stored.<sup>1</sup> Additional energy through food stored as fat is also used as a source of energy while in shortage and balances the energy intake cum expenditure. Energy intake beyond the actual requirement may cause excess fat deposition in the body (overweight or obesity), and less energy is also the cause of undernutrition (thin-shaped or underweight). However, other factors are involved, such as age, sex, height and weight, metabolic state, and the presence of minerals and vitamins in the individual's diet.<sup>1</sup>

The Harris-Benedict equation is the best way to calculate Basal Metabolic Rate, which is the energy our body needs to function if it has been resting for the past 24 hours. Hence, BMR is the lowest level of calories a body requires for basal activities such as digestion, breathing, controlling body temperature, etc. The equation is the most useful among all the BMR formulas. Although, calculating BMR with various web-based calculators or body composition analysis machine is only a tentative figure that may differ from the actual requirement of an individual. Here is a Harris-Benedict equation for males and females.<sup>2</sup>

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1. Men – BMR = 66.5 + [13.75 x weight(kg)] + [5.003 x height (cm)] - [6.75 x age].
2. Women – BMR = 655.1 + [9.563 x weight(kg)] + [1.850 x height (cm)] – [4.676 x age].

Obesity is one of the significant health issues globally. So, counting BMR should be a good initiative in case of a weight loss diet. BMR shows how many minimum calories one's body needs to function correctly. Accordingly, dietitians can prepare a diet plan. Once BMR is visible by a body composition analysis machine or online web-based calculator, it will be multiplied by physical activity level (PAL). To determine total energy expenditure (total calories requirement in a day), TEE, or TDEE, BMR will be multiplied by the activity factor. The activity factors start from sedentary 1.2 to heavy or sport level activities 1.9. TEE= BMR x PAL (1.2-1.9).<sup>1</sup> In this way, anyone gets the awareness of the minimum energy requirement from food to maximum energy according to the level of physical activities. The only factor not considered by the Harris-Benedict Equation is lean body mass.

There is another term called physical activity ratio (PAR), which is calculated as a ratio between the energy cost of an activity/minute and the energy cost of basal metabolism/minute.

In this article, I like to emphasize the recommendation of correct diet pattern and exercise plan as per the patient's /person's current status of body mass index (BMI), climate,

BMR, physical activity level (PAL), heart rate monitoring (HRM) and other health issues (if any) including body composition analysis. In conclusion, measuring energy (calories) and its proper knowledge boost the confidence of health care experts (HCP) and patient safety in diet, exercise practice, and other health parameters.<sup>3</sup>

### Conflict of Interest

None.

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