

Q1. The energy requirements are different for different people. Why?

A. Energy is required in the body for metabolic processes, physiological functions, muscular activity, heat production, growth and synthesis of new tissues. It is released from the food we eat by oxidation. The main sources of energy come from Carbohydrates, Protein and Fats. Humans need energy for Basal Metabolism, which comprises of a set of functions necessary for essential life, such as cell metabolism, metabolism of enzymes and hormones, transport of substances around the body, body temperature and ongoing functions of muscles including the brain and heart. The amount of energy needed for this purpose over a prolonged period of time is called B.M.R. (Basic Metabolic Rate.). And represents between 45-70% of daily expenditure depending on age, gender, body size and body composition. Physical activity is the most variable determinant of energy after B.M.R. Humans perform a number of physical activities which include,

1. Obligatory demands, such as, economic social and cultural demands ie work, school, house work etc.
2. Discretionary demands such as, energy expended for sport or social interactions.

Energy is also required to process foods into nutrients. The metabolic response to food increased the Basal Metabolic Rate by 10% over a day where people are on a mixed diet. Extra energy is needed for growth and for the synthesis of tissues. A child in their first three months of life will need 35% of the total energy requirement. This requirement drops off through our childhood with 1-2% needed in mid adolescence. In pregnancy extra energy is needed for the growth of the foetus, placenta and various tissues i.e. uterus, breasts, fat stores, as well as metabolic changes and increase of effort both at rest and during physical activities. Lactation will also require extra energy to produce milk and the energy needed to secrete it. It is therefore easy to see that once the afore mentioned information is given that depending on the factors of age, gender, body composition physical activity and depending on the individual's Metabolic Rate, whether you are an infant or a pregnant mother that different people will need different energy requirements at different stages of their lives.

Q2. What is B.M.I. And how can it be calculated?

A. B.M.I is known as Body Mass Index. It is a measurement of body fat based on your weight in relation to your height and is used as an indicator to a person's healthy weight. It is calculated as weight in kg divided by height on m squared.

The Body Mass Index table is.....

Underweight = less than 18.5
Normal weight = 18.5 x 24.9
Overweight. = 25-29.9
Obese. = 30 or greater

So for example if a person weighed 63kg and was 1.6 meters tall their body mass index would be 24.6 and by the table would just be inside the normal body weight.

This said the Body Mass Index does not work effectively on children or the elderly. Likewise athletes could also have a false reading when it comes to calculating their B.M.I. This is because muscle is denser than fat so a body builder for example could have a high BMI but little body fat. So other measures would need to be open place to take this into account like waist circumference and risk factors. This said athletes could still be overweight in some cases. A high BMI can cause diseases such as diabetes, high cholesterol and heart disease. A weight loss of just 5-10% can lower this risk. Having a BMI of over 30 is classed as obese (abnormal or excessive fat that is impairing health) and results in the energy intake being more than the energy expenditure of that person and is now a worldwide public health problem.

Q3. What is Basic Metabolic Rate? What is the difference between T.E.E. And B.M.R.?

A. A person's Basal Metabolic Rate (BMR) is the daily amount of energy their body requires at rest in a temperate environment. The energy is used to support essential functions of the human body and is particularly responsible for homeostasis. Some processes that factor into the BMR of a person are things like breathing, blood circulation, nerve function, brain activity and support of vital organs such as the brain and heart. An average person's BMR accounts for 70% of their daily expenditure.

TEE (total energy expenditure) accounts for all of the above plus the extra energy needed for physical activity both obligatory and discretionary also taking into account the persons age, gender, body composition etc.

Energy is released when certain nutrients are metabolised in the body this energy is used to power chemical reactions and cellular processes while some is lost in heat.

It is measured in kilocalories or kilojoules

Carbohydrates = 4 kcal per 1gram or 15-17 kilojoules

Protein = 4 kcal per 1gram or 16 kJoules

Fat = 9kcal per 1gram or 37 kJoules

A persons metabolic rate is also determined by....

Genes, which we cannot control but can play apart in a person having a faster or slower metabolism.

Age, calorie needs usually deplete by 2% every decade

Muscle to fat ratio, muscle cells are 7 times more demanding than fat cells

Activity level, exercise burns calories and keeps doing so up to seven hours afterwards

How we eat, metabolism increases as we digest food and slows down if we miss eating

Health and nutrition, the body is governed by thousands of chemical reactions and needs a constant supply to function properly.

Q4. What are micro nutrients and why does our body need them?

A. Called micronutrients because they are needed in minuscule amounts these substances are the magic wands that enable the body to produce enzymes, hormones, and other substances essential for proper growth and development.

Micronutrients are trace elements such as vitamins and minerals. They differ from macronutrients such as carbs, protein, and fat because as already stated they are needed only in small quantities.

Micronutrients include minerals such as fluoride, selenium, sodium, iodine, copper and zinc. And vitamins such as A B C D and K. Because our bodies cannot produce all vitamins and minerals it needs we obtain them from the foods that we eat.

Examples of these foods are...

Magnesium = apricots, prunes, brown rice, milk and yoghurt.

Selenium = grapes, grapefruit,

Apples = iron, phosphorus, zinc

Bananas = calcium and potassium.

Vitamin A = carrots, sweet potatoes, spinach and kale

Vitamin B = liver, legumes, bread and cereals

Vitamin C = strawberries, green leafy vegetables oranges

Vitamin D = egg yolks and cheese and fatty fish

Vitamin K = green leafy vegetables.

However not all diets produce the correct amounts needed leading to deficiency. Nutrient deficiency impacts many bodily functions including health immunity, energy levels, ability to focus and also stress. Serious diseases leading from deficiency include anemia and osteoporosis.

Fruits and vegetables today are not as nutrient rich as they were years ago due to pollution and agricultural methods. Fast food also contributes to a diet lacking in essential micronutrients.

Synthesised vitamins and minerals can be one option to getting our daily quota but how well these are absorbed by the Body is unclear.

The best way to obtain all the micronutrients from our food is to eat real food ie fresh fruits and vegetables as close to its natural state as possible. By doing this you are not just eating isolated nutrients but a whole range of vitamins minerals and fibre that allow for optimal use by the body.

