Understand the three macronutrient food groups - Carbohydrates, Proteins, and Fats

There are three major food groups (also called macronutrients) in our diet – Carbohydrates, Proteins, and Fats. These are called macronutrients because the body requires these in large amounts. The body also needs micronutrients such as minerals, vitamins, phytonutrients, and antioxidants. The micronutrients are essential for survival and are present primarily in fruits and vegetables and natural foods. Synthetic, preprepared boxed and packaged foods do not have these essential micronutrients. Deficiency of micronutrients in the body causes food cravings. That is called "Nutrient deficiency hunger." People who primarily consume synthetic foods suffer from nutrient deficiency hunger.

Each of the three macronutrients is processed very differently in the body. The thinking behind the low-calorie diet plans assumes that the body handles all the three macronutrients similarly. Therefore, one can replace one for the other, example-low carbohydrate/high protein diet plan or low carbohydrate/high-fat diet plan, etc. This thinking is flawed because each macronutrient is unique in the way the body uses it to maintain optimal health.

What is a food calorie – A calorie is a unit of energy. The caloric value of each food is measured by burning the food in a laboratory and measuring the heat energy released. The caloric value of the three macronutrients is as follows:

Carbohydrates – 4 calories/ gm Protein – 4 calories/ gm Fats – 9 calories/gm

So, gm per gm fats provide twice the calories when compared to carbohydrates and proteins. The humans who are eating a balanced, healthy diet typically, consume far less fat than the other two macronutrients. Per medical recommendations, the healthy balanced diet must contain:

- 40 45% of food as natural low glycemic (no sugary) carbohydrates.
- 25 30% food as protein (vegetable protein is healthier than animal protein).
- 20 30%% food as fats (fats of plant origin are healthier than fats of animal origin).

The daily caloric requirement of the body is 25 - 30 calories/kg for an average adult. It is higher, up to 40 - 50 calories/kg in growing child, pregnant and lactating female and athletic individuals.

The caloric requirement of a female, who weighs 50kg will be about 1200 calories. Of this 25 – 30% of the calories should come from healthy plantbased fat. That will be about 300 – 400 calories. One gram of fat has nine calories. So the fat requirement for an average 50kg

female will be 30 - 40 gm daily. In the simple measurement, it will be 7 - 8 teaspoonful of fat (each teaspoon being 5 gm).



The very low carbohydrate diet regimens are neither safe nor sustainable long term for good health. The healthy low glycemic carbohydrate is an essential macronutrient required for the normal energy needs of the body. When it comes to carbohydrates, quality becomes important.

1. Carbohydrates – This macronutrient is broken down in the digestive tract into glucose. The glucose gets absorbed into the blood. The insulin hormone is the essential glucose utilization hormone in the body. A human cannot survive more than a few days in the absence of insulin. Insulin is secreted by pancreas gland which located in the abdomen behind the stomach. In Type1 (childhood onset diabetes) the capacity of the pancreas to produce insulin is destroyed entirely. The only way this individual can survive is to inject insulin as medication on a daily basis. The insulin performs the most critical function of producing energy from glucose in the body. This energy is essential for the cells to live and function. The truth to know about carbohydrates is:

"The carbohydrate in itself is not the problem, but the quality of the carbohydrate is !!"

Unfortunately, the industrial food chain has given humans, a new breed of carbohydrates, which did not exist 50 years back. This new breed includes unnatural high glycemic carbohydrates such sugary foods and drinks and refined wheat flour products. When consumed in abundance, these sugary foods cause high blood glucose and high blood insulin levels. The high insulin levels, eventually lead to obesity and Type 2 diabetes. Refined sugars and refined flours are the two major slow poisons in modern foods.

Two Modern Food Poisons



The energy produced by glucose is of 2 kinds:

* The energy for immediate use by the cells.

* The reserve energy – This gets used at times when the glucose is not available from the food, such as during fasting and starvation periods. There are two kinds of reserve energy:

- a) Glycogen energy reserve Insulin converts excess of glucose in blood into glycogen. This gets stored in the liver and the muscles. Glycogen is a shortterm energy reserve, which is broken down rapidly into glucose, whenever needed. An excellent example of glycogen energy use is during the night and in the morning when the body is in nighttime fasting mode. Glycogen energy also comes handy, when there is sudden muscle activity, requiring a large amount of glucose energy. Glycogen energy reserves are only good for 36 – 48 hours. Glycogen reserves can be compared to money in the wallet, to be spent immediately, whenever needed at short notice.
- b) Fat energy reserve Fat is a long-term energy reserve, which can provide energy to the body during long periods of starvation. Once the glycogen stores in the body are filled up, the excess of glucose remaining in the blood is converted into fat by the hormone insulin. The energy from the fat reserves represents the survival mechanism of humans during the times of starvation. The fat energy reserve evolved in pre-agrarian humans, who were hunters and gatherers and did not have a consistent supply of food. The modern urban human, on the other hand, if



Glycogen - short term energy reserve (24 - 36 hrs) Fat - long term energy reserve (2 - 3 weeks)



affluent is surrounded by an unlimited amount of sugar-rich carbohydrates all day long. Unfortunately, the human body has unlimited capacity to store fat. The excess sugar consumed leads to high levels of glucose and insulin in the blood. More the insulin in the body more will be the fat storage and obesity. Fat storage starts with liver first, followed by the abdomen (big belly), abdominal organs , heart, in the muscles, under the skin, and into the blood vessels. Fat deposits (cholesterol) in the blood vessels cause heart vessel blockage and heart attacks. Liver fat is the first abnormality which eventually leads to Type 2 diabetes.

"Insulin, in essence, is a fat storage hormone. The diabetes specialists know this fact well. Once they start a patient on insulin injections, the patient starts to gain weight rapidly. More the insulin patient injects, more will be the weight gain. If a diabetic patient on insulin injections, wishes to tame the weight and keep the diabetes complications under control, he/she must make food and lifestyle change to minimize the daily insulin need"

- 2. Proteins Proteins are broken down in the digestive tract into aminoacids. These are the building blocks for muscles, body tissues, growth, and repair. Unlike carbohydrates, proteins are not the normal energy source for the body. The diet plans which push for high protein intake are unhealthy and energy deficient. Also, higher than needed protein intake, produces excessive acid waste in the body which leads to osteoporosis (bone thinning) and kidney damage. Per medical recommendations the daily requirements of proteins should be as follows:
 - a. Adult male 0.8gm/kg
 - b. Adult female 0.6gm/kg Pregnant and lactating female 1.0gm/kg
 - c. Athletic male/Female 1.0-1.5gm/kg
 - d. Growing child/ young adult 1.5-2.0gm/kg
- 3. Fats Fats are broken down in the digestive tract into fatty acids. Fats are essential for the body as these are building blocks for the nervous system. The synthesis of essential hormones such as cortisol and sex hormones requires fats. The fats of plant origin are healthy. The fats of animal origin (meats and dairy products including milk, cheese, paneer, and milk-based sweets) on the other hand are unhealthy saturated fats. The healthy plant-based fats include olive oil, sesame oil, mustard oil, coconut oil, cold compressed non-hydrogenated (unrefined) vegetable oils, avocados, seeds, and nuts.

Per medical recommendations, 20 - 30% of total calories needed by the body, must come from the healthy plant-based fats in the diet. That translates to 6 - 8 teaspoons of healthy oils and 2 - 3 teaspoons of ghee. The seeds, nuts, and avocados are excellent sources of healthy fats.