MACRONUTRIENT BREAKDOWN

(Protein – Carbohydrates – Fat)

In order for an individual to begin to understand how to properly balance their meals, for both optimal performance and weight management, they must first become educated on macronutrients. Macronutrient's can be broken down into three sections: proteins, carbohydrates, and lipids (fats). It is important to note that no matter what fad diet or latest craze is being marketed, all three types of food are needed. All three work together in an integrated fashion to supply us with our health and overall wellness. Below you will discover what values each macronutrient has for your body.

Protein:

Protein is one of the most plentiful substances in the body and is needed for many body functions. It is very important to the maintenance of good health. It is also vital to the growth and development of all body tissues. It is a major source of building materials for muscles, skin, nails, blood, and internal organs. Protein is needed for the formation of hormones. Hormones' control a variety of body functions such as growth, sexual development, and metabolic rate. It also acts to prevent blood and tissues from becoming too acidic or too alkaline. Another important function is that protein helps regulate the body's water balance. Enzymes and antibodies are also formed with protein. Protein plays an important role in the production of milk during lactation and in the process of blood clotting.

Protein is also used as a source of heat and energy. It provides four calories per gram. The body is not able to store protein. Too much protein will force your body to get rid of the excess. In popular fad diets (high protein diets), your body utilizes protein for energy because the carbohydrates are too low thus forcing your body to utilize protein instead. The problem with this is protein should be utilized for muscle repair and recovery not as energy. This will result in muscle tissue loss and slow down your metabolism.

When protein is ingested, the body must alter it by breaking it down into smaller units. These smaller units are also known as the building blocks of protein, are called amino acids. This allows the body to prioritize the distribution of amino acids to sustain life. The human body must than rearrange the amino acids into the proper order to form the necessary protein. The human body requires approximately 22 amino acids in a specific pattern to synthesize body-tissue proteins. There are eight amino acids that cannot be produced in the human body. The eight are considered to be essential amino acids and must be supplied to the body via food and/or supplementation.

The Recommended Dietary Allowance for protein is a good place to begin to formulate how much protein is a generous and safe protein intake. The RDA for protein is based upon the requirements of an average 154-pound male. These requirements were established to ensure that a particular individual would be able to receive the amount of protein necessary to repair and replace tissue proteins under normal conditions. Additional allowances can be made depending on the individual. The RDA for protein is 0.8 gm/kg/day. This is based on the biological value (BV) of 70. The BV of protein is a measure of the extent to which it satisfies the amino acid requirements for growth or the maintenance of the total body function. Below you will see a chart of protein requirements for a bodybuilder, an active recreational athlete, and an endurance athlete.

	Bodybuilder	Rec Athlete	Endurance Athlete
Minimum Intake	1.0 gm/kg/day	1.0 gm/kg/day	1.4 gm/kg/day
Adaptation Period	1.6-2.0	1.2-1.8	1.6-2.0

Carbohydrates:

Carbohydrates are the chief source of energy for all body functions and muscular exertion. A gram of carbohydrate yields four calories. This leads to a rapid depletion of available and stored carbohydrates and creates continual cravings for this macronutrient. Carbohydrates also help regulate the digestion and utilization of protein and fat. The main carbohydrate that is present in food occurs in the form of simple sugars, starches, and cellulose. Simple sugars such as fruit and honey are very quickly digested. Double sugars, such as table sugar, require some more digestive action than simple sugar. Starches are more complex and therefore take more time to digest. An example of a starch is wheat bread. Cellulose is indigestible by humans and contributes little energy and value to the diet. Cellulose is found in the skins of fruit and vegetables. It does provide the bulk necessary for intestinal mobility and aids in

elimination.

All sugars and starches are converted by the body into simple sugars, such as glucose or fructose. However, all sugars must become glucose before the body can utilize them for energy. Some of the glucose is utilized as fuel by tissues of the brain, nervous system and muscles. A small portion of glucose is converted to fat and stored throughout the body as a reserve of energy.

The amount of recommended carbohydrates does depend on the individual, but in general carbohydrate intake should average between 40-75% of total caloric intake.

Lipids:

Lipids also known as fats, is the most concentrated source of energy in the diet. One gram of fat yields nine calories. They supply more than twice the calories per gram versus a carbohydrate or protein. Fats also act as carriers for the fat-soluble vitamins A, D, E and K. By aiding in the absorption of vitamin D, calcium is also available to the tissues, particularly to the bones and teeth. Fats are also important for the conversion of carotene to vitamin A. Fats are involved in the following: cellular membrane structure and function, precursors to hormones, cellular signals, and regulation and exertion of nutrients in the cell.

Fat deposits surround, protect and hold in place organs, such as the heart, liver, and the kidneys. Fat is used as an insulator for any kind of environmental temperature changes and it is also preserves body heat. Dietary fat prolongs the digestion process by slowing the stomach's secretions of hydrochloric acid, thus creating a longer lasting sensation of fullness after a meal. Dietary fat initiates the release of the hormone cholecystokinin (CCK), which contributes to satiety.

Most of the fat we consume in our diet is ingested in the form of triglycerides. Triglycerides are made up of a glycerol with three fatty acids attached. These fatty acids differ from one another in two ways: chain length and degree of saturation. Saturation refers to chemical structure. The more unsaturated the fat, the lower its melting point and the more likely it is to become a liquid at room temperature. A saturated fatty acid is one that carries the maximum number of hydrogen atoms, leaving no points of unsaturated. Unsaturated fatty acids can be divided into two types: mono and polyunsaturated fats found in food contain a mixture of the three kinds of fatty acids.