

Chapter 1: The Macronutrients

The foods that we eat are broken down into macronutrients, vitamins and minerals. There are just three macronutrients, carbohydrates, proteins and fat. All three are typically made up of smaller molecules (see figure 1). Carbohydrates are made up of sugars, proteins are made of up amino acids and fats are made up of fatty acids.

You can of course eat sugar it in its pure form. Many people put table sugar in her coffee or brown sugar on their oatmeal. Typically, carbohydrates are eaten and broken down by digestion into sugars. The majority of the carbohydrates we take in eating the SAD or “Standard American Diet” are grains, potatoes and sugar itself. They are digested and either used for energy immediately or metabolized and stored as fat.

Most people don't realize how much of their dietary intake is composed of carbohydrates. An English physician, Dr. David Unwin, illustrates for his patients how much carbohydrate they eat by having them visualize teaspoons of sugar after the carbohydrates are broken down into simple sugars (see figure 2). For example, A piece of bread is mostly made up of carbohydrates and has the equivalent of 8 teaspoons of sugar in it. A cup of rice, 12 teaspoons. The incredible thing is, at any one time there is approximately just 1.5 teaspoons of sugar circulating in the blood stream.

Protein, another macronutrient, is made up of amino acids. Proteins can likewise be used for energy if metabolized. They can also be used for many other things. Protein can be used for structural elements like hair and nails. They can be used for metabolic uses like enzymes or hemoglobin, the molecule that carries oxygen around the body inside of our red blood cells. We need approximately .8 g to 1.2 g of protein per kilogram of lean body mass each day. Most

people eat significantly more protein than they actually need. Unlike carbohydrates, which the body can make anytime if it needs to, there are a few types of amino acids which are considered “essential.” That is, we must take them in through dietary sources because our bodies can’t make them. Without these essential amino acids, we would get sick.

Fats are made up of fatty acids. Like proteins, we cannot make all the different types of fatty acids we need. Two fatty acids are “essential“. They are omega-3 and omega-6 fatty acids.

It is important to understand the concept of an essential nutrient. Again, this is a nutrient that the body can’t make itself but must ingest it in order to maintain good health. For example, in the case of proteins there are a total of 22 different amino acids. Four of these amino acids are essential. The body can’t make them so we need to acquire them by including them in our diet.

Likewise, there are two fatty acids, omega-3 and omega-6 fatty acids, that the human body can’t make. Therefore, like the essential amino acids, we must include them in our diet. Carbohydrates are different. There is no such thing as an essential carbohydrate. We don’t need to include any carbs in our diet. Our bodies can make all the sugars, or carbs, that it needs any of the macronutrients, carbohydrates, proteins and fats.

Obesity can be thought of as a hormonal problem. And that problematic hormone is insulin. Insulin has many different functions. Among the most important is supplying the body’s immediate energy needs. It is the “key” that unlocks the door and allows glucose to enter cells. There, sugars are broken down and utilized for energy. Sugars also have other uses as well. Sugars that are not used immediately for energy are stored for future energy needs. Another function of insulin is storing excess calories as fat. It also inhibits the breakdown of fat. Thus,

when carbs are being eaten, and insulin is stimulated, no fat can be burned. There's no need to. The immediate energy needs will be met by the circulating blood sugar.

Of the 3 macronutrients, it is primarily carbohydrates that cause a spike, or increase, in insulin after a meal. Protein can cause insulin levels to rise a little, and fat hardly at all. It is insulin's job to keep the amount of glucose in the blood steady. Interestingly, only 1.5 teaspoons at any one time. If there is too much sugar coming into the blood stream by digestion, insulin levels increase to eliminate the excess by storing them as fat.

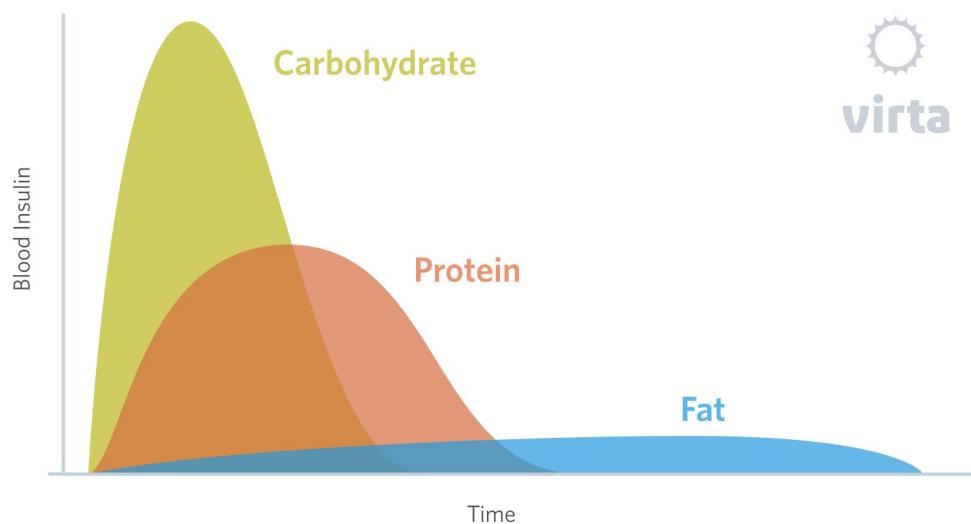


Figure 1. Macronutrient Effect on Insulin

For those in a habit of eating an excessive amount of carbohydrates, which is the majority of Americans, much more insulin needs to be secreted from the pancreas because the body becomes less “sensitive” to it. Overtime this insulin insensitivity, or insulin resistance, gets worse. More

and more insulin needs to be produced by the body to keep the blood glucose levels steady and within normal limits. When this happens, insulin is circulating at above normal levels. When insulin levels are high, fat cannot be broken down and used for energy and we get fatter and fatter by storing more and more carbs as fat.

To reverse this chronic insulin resistance, we must reduce our carbohydrate intake. The human body is much like a hybrid car. In the case of a hybrid car, it can run on either gas or electricity. Similarly, our bodies can run on either of two different fuels, carbohydrates or fats. Thus, the primary reason for eating a low-carb diet is to force our bodies from being a carb burner to being a fat burner.

There's an old saying, "where you can measure you can manage". With the low carb approach, we won't be counting calories so much as the number of grams of each of the three macronutrients. You can calculate this fairly easily by looking at food labels. Food labels will have the number of grams of carbohydrates, proteins and fat on them. Unfortunately, real whole foods like meats, vegetables and fruit don't carry labels.

Although you will find a government mandated food label on processed foods such as a box of cereal, you won't find them on broccoli, asparagus or lettuce. For that, you will need a small book that has such things in it, search online for a website with such information, or, simply use a smart phone app. Apps like MyFitnessPal, LoseIt, CarbMaster or CarboKing make the job fairly easy. You simply utilize the search function of one of these apps. For example, if you searched for 1/2 cup of white rice it might state that it has 24 grams of carbohydrates. As you enter more foods, it would keep a tally for you and tell you how many total grams of carbohydrates you have eaten that day.

Many apps are able to also keep track of calories burned by exercise. The diet recommended by the United States USDA has 20% fat, 30% protein and 50% carbs. That's way too many carbs! We must do better. A modified Mediterranean diet has 40% fat, 30% protein and 30% carbs. The ketogenic diet is one that is considered high fat, moderate in protein and low in carbs. It is made up of approximately 70% fat, 20% protein and 10% carbs. Most people eating a ketogenic diet eat less than 30 grams of carbs per day. The standard American diet has over 20 times that!

Chapter Summary

- The foods that we eat are broken down into macronutrients, vitamins and minerals.
- There are just three macronutrients, carbohydrates, proteins and fat. All three are typically made up of smaller molecules (see figure 1).
- Carbohydrates are made up of sugars, proteins are made up of amino acids and fats are made up of fatty acids.
- Carbohydrates are used primarily for energy.
- Proteins are used for such things as energy production, metabolic processes such as enzymes and structural elements such as hair, nails, and bone.
- Fats are used for such things as energy production, cell walls and nervous tissue.
- An essential nutrient is a nutrient that the body can't make but must have in order to maintain good health.

- Unlike protein and fat, we don't need to include any carbs in our diet. Our bodies can make all the carbs (sugar) that it needs out of the other two macronutrients.
- Obesity is a hormonal problem. And that problematic hormone is insulin. Insulin has a number of different functions. First, it is important for supplying the body's immediate energy needs.
- Other functions of insulin are storing excess sugars as fat and preventing the breakdown of fat.
- Of the 3 macronutrients, it is primarily carbohydrates that cause a spike, or increase, in insulin after a meal. Protein can cause insulin levels to rise a little, and fat hardly at all.
- For those in a habit of eating an excessive amount of carbohydrates, much more insulin needs to be secreted from the pancreas because the body becomes less "sensitive" to it
- When insulin levels are high, fat cannot be broken down and used for energy and we get heavier and heavier by storing more and more carbs as fat.
- To reverse chronic insulin resistance, we must reduce our carbohydrate intake.
- Healthy, whole foods like meats, vegetables and fruit don't carry food labels.
- Smart phone apps can help us track macronutrients and calories consumed and burned