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A Nutritional Primer By: James L. Holly, MD

Over the next few weeks, we're going to discuss the fundamentals of nutrition. While this will seem elementary to many of our readers, it will give everyone a sound foundation for making healthy dietary and activity choices for the New Year. As each person makes decisions about weight, exercise, conditioning and health, there are certain things you must know in order to make informed, intelligent, valid decisions. Our goal is to give us all that information.

Today, we will discuss how to determine your "ideal body weight." Remember, we're not talking about "body image," or a "Barbie Doll" figure. We're talking about health; we're talking about living well for as long as you live. Next week, we'll continue talking about nutrients, particularly fats, cholesterol and vitamins. Finally, we'll discuss how to make life-style changes which will benefit your health for the rest of your life.

Remember, IT IS NEVER, EVER TOO LATE TO START making healthy choices for your life.

What is a Nutrient?

A nutrient is defined by the Oxford American Dictionary, as "a nourishing substance." To understand the basics of nutrition you need to first understand the concept of food and energy. There are three kinds of nutrients:

- Macronutrients,
- Micronutrients and
- Water.

Macronutrients include: Fat, Carbohydrates, and Protein. "Macro," meaning large, suggests that macronutrients are those that are present and needed in large amounts. Micronutrients ("Micro" means small) vitamins and minerals--are present in much smaller quantities. Water, although not thought of as a nutrient, is a component in all foods and is an essential element of life.

Each of the three nutrients have specific functions and they work together to carry out their functions. Macronutrients provide energy and help maintain and repair the body. Micronutrients, both vitamins and minerals have different functions. Vitamins help regulate chemical processes in the body which will be explained later. Minerals again help the vitamins with their functions and play a vital role in body maintenance as well, notably in the formation of new tissue, including bones, teeth, and blood. Water provides a fluid medium for all chemical reactions in the body, and for the circulation of blood, removal of waste, and the regulation body temperature.

Your body burns a mixture of macronutrients for energy. The production of energy ---and the potential for a food to supply energy---is measured in calories (kcal). The caloric content of a food is determined by measuring the amount of heat produced when the food is burned in a laboratory device called the calorimeter. The heat that is generated compares to the energy produced in the human body. It is recommended to not lower your caloric intake below 1200 calories (for an adult) unless under a doctor's supervision.

It's also important to realize that everybody has different needs (infants, children, elderly, etc.). A key element in watching your caloric intake is to always think of food as energy. What you put into your body must equal your energy output (yard work, house cleaning, aerobics, baseball, etc.) or you'll see weight gain. 3500 kcal is the equivalent to 1 lb or .45 kg of body fat.

How Many Calories Do You Need?

The following steps are tool to help figure out your daily caloric needs. Remember that this is just a guideline for you to follow and if you have any questions, please contact your doctor or a local registered dietitian.

Step One:

Multiply your ideal body weight or present weight by 10 (use your ideal body weight if you want to lose body fat). How to find your ideal body weight is given below.

EXAMPLE:

145 (Present or ideal body weight)
X10
1450 (kcal you need daily to rest)

Step Two:

Find your activity factor in the list below and multiply it by your weight to get the calories you need to perform daily activities.

EXAMPLE:

145
X 5 (activity factor)
725 (kcal you need for daily activities)

Step Three:

Add the sums from steps one and two to get the calories you need daily to maintain your present weight.

EXAMPLE:

1450
+ 725
2175 (kcal you need daily to maintain your present/ideal weight)

Step Four:

If you want to lose weight, subtract 250-500 calories a day and increase your exercise to burn an additional 250-500 kcal/day. This will allow a healthy weight loss of 1 to 2 pounds per week. To gain weight, add an additional 500 kcal/day and increase your strength training to ensure a weight gain of healthy muscle and not fat.

EXAMPLE:

2175
- 500 (dietary kcal to eliminate)
1675 (daily kcal intake to lose weight)

Ideal Body Weight Estimation:

Female: 100 lb for first five feet, 5 lb for each additional inch (+/- 15 lb)

Male: 105 lb for first five feet, 6 lb for each additional inch (+/- 15 lb)

Activity Factors:

3 Sedentary: no exercise

4 Moderately Active: Exercises, gardens, does housework 3 - 5 times per week for 20 to 30 minutes at a time. Uses stairs and walks briskly.

5 Active: Exercises 3 - 5 times a week for 60 minutes at a time. Uses stairs and walks briskly.

7 Very Active: Exercise 3 - 5 times a week for 90-plus minutes at a time. Uses stairs and walks briskly. Daily physical activity and competitive with recreational sports.

REMEMBER: These are only estimates. Individual activity factors and body frames vary from person to person and the individual's lean body mass. The most important thing to remember in reaching and maintaining a healthy lifestyle is to get to know your body and your body type. Every person who is 5'4", is not going to weigh 120 lb. The average person's body is on the upper end of the scale, around 135lb. So please, remember to personalize your needs based on the guidelines given.

Basic Healthy Diet

Once you've figured out how many calories your body needs, it's time to determine the nutrient breakdown. With the information given above, you can estimate the amount of each nutrient with these following guidelines:

55% of your total daily calories from carbohydrates, carbohydrates have 4 kcal/g

<30% of total calories from fat, fat has 9 kcal/g

12-15% of total calories from low-fat protein sources, protein has 4 kcal/g

example:

John needs 2000 kcal/day

$2000 \times .55 = 1100$ kcal, 4 kcal in 1g carbohydrate

1100 kcal = 275g carbohydrates (CHO)

4 kcal/g

For example, one serving of Broccoli Coleslaw has 6 grams CHO and a slice of bread has 18 g of CHO.

Carbohydrates

Carbohydrates are the most efficient fuel for the body because they can be broken down almost instantly. Most carbohydrates are from plant sources and include all sugars, starches and all types of dietary fiber. Once into the body the sugars and starches are transformed into glucose. Glucose is carried in the blood and transported to cells for

energy. Carbohydrates come in two forms: complex and simple. For the healthiest diet, you want to consume a diet rich in complex carbohydrates.

Simple carbohydrates are sugars. These are found in all sorts of places such as soups, spaghetti sauces, fruit drinks, frozen dinners, cereals, and yogurts. They are, of course, also found in the traditional candy items and soft drinks. Most importantly, they occur naturally in fruits, vegetables and dairy products.

Complex carbohydrates are better for you than simple ones because they usually come with lots of other nutrients as well. They are grains such as rice, bread, and pasta, and vegetables such as corn and potatoes. Legumes are included in this category and are also high in protein. Most simple carbohydrates only offer you calories, and lack more nutritious substances like fiber, vitamins, and minerals. You should try to eat 6 to 11 servings of complex carbohydrates (55% of daily kcal) and limit your sweets sparingly.

Fiber is another type of carbohydrate that is very important to a healthy diet. Fiber is found in whole grains, fruits, and vegetables. These parts cannot be digested by enzymes in the stomach and therefore are excreted from the intestinal tract. There are multiple benefits of fiber, and, most importantly, foods that are high in fiber are normally low in fat and calories. It also represents a large bulk to the diet to help fill you up faster. The recommended amount of fiber is 20 to 30 grams a day, and others suggest even more--40 to 50 grams a day.

Although eating too much fiber often causes discomfort (bloating, cramps, intestinal gas, etc.) the health benefits out-weigh the negative effects. Fiber helps with constipation, decreases the risk of colon and rectal cancer, helps reduce total blood cholesterol, and helps control blood sugar with diabetes. Also, when increasing your fiber intake, your body will slowly adjust and the negative affects will ease.

Protein

Protein should consist of 12-15% of your daily caloric intake. That means for John's 2000 kcal/day diet he should have 75 g of protein. ($2000 \times .15 = 300$; $300/4 = 75$ g). Most Americans eat on the average 100 g of protein/day which dramatically exceeds the recommended daily allowance. A large misconception is that you need to get your protein from animal sources. Animals are a great source of protein, with lean meats and low-fat dairy products, but you can also get protein from vegetables and legumes (beans). For example, broccoli, carrots, and cauliflower contains 3 g of protein in a 4 oz serving size.

Protein makes up three-fourths of your total body, including muscles, organs, enzymes, and some hormones, which are largely composed of protein. A protein is made up of chains of amino acids which are the end by-product once proteins are digested in the stomach. Only thirteen of the twenty-two amino acids can be made by the human body.

That means that there are nine essential amino acids (essential, meaning they need to come from our diet).

Proteins are also categorized as "complete" and "incomplete." Complete proteins contain all nine essential amino acids, and consequentially, incomplete proteins do not. Fruit, grain, and vegetable proteins are considered incomplete. Although incomplete, they are still a great source of protein when eaten in combinations that contain all nine amino acids. These combinations have been done for years (beans and rice, beans and cornbread, and corn and lima beans).

The USDA's Food Guide Pyramid recommends 2-3 servings of protein per day, depending on your energy needs. Other health professionals recommend even less, 1 to 3 servings. Americans generally eat too much protein and not enough calcium rich dairy products, so they recommend eating more low-fat milk, yogurt and cheese. This also is affected by the large portion sizes many Americans indulge in.

Next week, we'll learn everything you ever didn't want to know about fat in your diet. And, don't forget, it's your life and it's your health.