[IMAGE]

The Science of Sustained Nutrition

By Clair Dainard, BSc

We eat for so many reasons - because we are happy, to reward ourselves, to relieve stress; sometimes simply because we are bored. With food being involved in so many aspects of our daily lives, it is easy to forget the real reason why we need to eat: to provide fuel for our body. In today's busy world, many of us are plagued by low energy and constant stress. Unfortunately, this can often lead to poor food choices that can further impair our energy levels. The foods you eat throughout the day can help maintain energy as well as enhance your ability to cope with stress. By pairing the correct foods at the right times, you can enjoy the benefits of sustained energy throughout the day.

The Macronutrients: Carbs, Fats and Protein

Carbohydrates, fats, and protein are known as the energy-yielding nutrients. These are the dietary components your body can actually break down to create molecules of energy known as ATP (adenosine tri-phosphate). While many diet plans emphasize focusing on one macronutrient over the others, a healthy diet represents balanced intake from all three groups. Lets take a quick look at each macronutrient and how it impacts energy levels.

Carbohydrates

running man - Copyright â Stock Photo / Register Mark Carbohydrates are often seen as your body's preferred source of energy because they can most easily be broken down to create ATP. In fact, for several of your body's tissues, including your brain, carbohydrates are actually the main source of fuel. Several years ago, carbohydrates got a bad reputation when they were highlighted as a cause of weight gain during the "low carb diet" trend. Unfortunately, this movement failed to elucidate the differences between "good" and "bad" carbohydrates and their relative impact on energy and overall health.

Simple carbohydrates, such as white bread, cookies, and anything made with refined flour, provide the body with a rapid rush of energy as they are quickly metabolized for fuel. Unfortunately, this energy rush is often followed by a fall in blood sugar, felt by the individual as an energy crash (and of course, hunger). This phenomenon is why a diet high in *refined* carbohydrates has been linked to weight gain, insulin resistance,

and elevated triglycerides.

On the other hand, a diet high in *complex* carbohydrates - whole grains, fruits, and vegetables - can offer unlimited health benefits. These carbohydrate sources contain dietary fiber, which provides a slower release of energy and contributes to feelings of fullness and satiety. When selecting whole grains, look for options that provide at least 3-4 grams of fiber per serving and stay away from anything that lists "enriched flour" as a main ingredient. Fruits and vegetables, cooked or raw, are always a great option. However, stay away from fruit juices, which often contain added sugar and no fiber, as well as jams, jellies, and any other generally processed products.

Fats

Just like carbohydrates, fat has received some negative publicity when it comes to a healthy diet. However, fat is actually the most energy-sustaining nutrient since it provides 9 kilocalories (kcals) per gram (protein and carbohydrates only provide 4 each). Fat is also digested more slowly and when consumed correctly, can help provide a steady, slow release of energy and contribute to feelings of fullness.

Much like carbohydrates, when incorporating fat into your diet it is important to differentiate between healthy and unhealthy fat sources. While saturated and hydrogenated fats can negatively affect health, omega-3 fatty acids, which can be found in nuts, seeds, and cold-water fish, can contribute to neurological and cardiovascular health.

Another form of healthy fats, MCTs or medium chain triglycerides, is metabolized differently by your body and provide unique energy-yielding benefits. As the name suggests, MCTs are shorter in size than the long-chain fatty acids consumed by in the average diet. While most dietary fat must travel through the lymphatic system before being metabolized in the liver, the smaller MCT molecules are almost immediately taken up by the hepatic metabolic enzymes, making them a very efficient fuel source. Studies have shown that a diet rich in MCTs can actually support weight loss.

MCTs can be found in coconut and palm oil. It is important to remember that MCTs are still a fat source and by nature are relatively calorically dense. Make sure that the MCT levels you consume still fall within your recommended daily calorie allowance.

Protein

Unlike fats and carbohydrates, protein is often touted as the healthiest of the macronutrients. It is true that protein, in addition to providing a source for energy production, is also required for the makeup of skeletal muscle and enzymes. Consuming meals high in protein can support lean body mass as well as contribute to satiety and blood sugar control. Before you go loading up on protein shakes, however, it is important to remember that protein still provides calories and overconsumption can still lead to weight gain. Aim for daily protein consumption of around 0.8 -1 grams per kilogram (2.2 pounds) of body weight (that's about 80 grams of protein for a 175-pound individual). Food sources high in protein include meats and poultry, legumes, nuts, and quinoa.

The Micronutrients: Vitamins and Minerals

When it comes to energy production, vitamins and minerals serve as the co-factors for the enzymes involved in your metabolic processes. Most notably, the B vitamins are directly involved in supporting the metabolic pathways which create energy (ATP) from your food. There are currently eight molecules classified as B vitamins: thiamin, riboflavin, niacin, pantothenic acid, pyridoxine, biotin, folate, and methylcobalamin. Each of these plays an intricate supporting role in metabolism, and deficiency in any B complex vitamin can result in severe impairments in energy production.

For the most part, the B vitamins are widely distributed in our food supply and thanks to FDA-mandated fortification of bleached flour, even processed foods can provide a substantial dose (look for enriched flour on your food labels). Recent research has suggested, however, that natural forms of B vitamins may be a better source. There have even been some studies that suggest high intake of synthetic B vitamins could potentially be harmful (most notably folic acid). Natural food sources of B vitamins include whole-grain breads, nuts, seeds, and legumes.

Another essential nutrient that is critical to energy production is magnesium. In addition to being an important component of the bone matrix, this mineral is a co-factor for over 300 enzyme complexes in the human body, including those involved in metabolism. Magnesium, coupled with calcium, is also essential for the contraction of skeletal and smooth muscle. It is estimated that nearly 70 percent of Americans consume inadequate levels of dietary magnesium. Deficiency of this mineral has been linked to low energy, osteoporosis, muscle pain, and fatigue.

Food sources of magnesium include green leafy vegetables, spices, and nuts. When using magnesium supplements, look for forms that are amino-acid chelates (magnesium glycinate/aspartate) or organic salts (magnesium citrate/malate) of the mineral. These forms are highly absorbable and bioavailable. Magnesium oxide and other inorganic salts should be avoided. If bowel tolerance is a concern, aim for magnesium glycinate, which has been shown to better tolerated than magnesium citrate alone. (Talk to your doctor for more information.)

Calories and Meal Planning

food pyramid - Copyright â Stock Photo / Register Mark Other major diet mistakes which can contribute to low energy levels are skipping meals and consuming inadequate calories in efforts to maintain or lose weight. Remember: Your body needs calories to create energy! Aim to consume meals and snacks every two to four hours. You may even want to start packing healthy snacks to take with you whenever you go.

When selecting snacks, aim for foods that provide balanced levels of fats, carbohydrates, and protein such as whole-grain crackers and nut butters or carrots and hummus, which will help keep your energy levels steady. Low-calorie snacks high in simple carbohydrates should be avoided. While 100 calorie servings of baked chips or rice cakes may sound appealing, the energy they provide is usually short-lived.

So, the next time a long day at the office causes you to turn to your candy stash, stop and ask yourself if that really is the best selection. In fact, why not ask yourself that question *before* you stash any candy in the first place? Remember that the foods we often turn to first during times of low energy are generally not the ones that will provide us the with the best energy boost. While no one food choice is the best for supporting energy levels, a balanced combination of macronutrients which provide a high dose of micronutrients, including B vitamins and other supportive nutrients, will give your body the nourishment it needs. That’s the science of sustained energy.

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