

stored energy

Glycogen

AUGUST 2013

ALIVE!

WHEN BUILDING our home, I told the carpenter that I wanted a large walk-in pantry. He showed it to me sometime later and I commented that it seemed small. He assured me that I did not understand how things look before they are sheet rocked and that the pantry was quite large. I assured him that he had no idea how much food I like to keep in a pantry. It's not like I grew up with fear of no food in the house. Nor have I ever experienced natural disaster induced food shortages. I just like having extra around, just in case.

I do the opposite when it comes to fueling my car. I often empty the gas tank and continue driving on red until I reach a certain level of

anxiety over whether I will have to walk to the gas station or not. For illustration, let's say that I drive for a living. Every day I pump 10 gallons of gas into my car and drive about 500 miles, in my Prius of course. This is my daily pattern. I use up what is put in, without excess or shortage. I have a little gas left in the reserve just in case

I need to drive an extra 50-100 miles.

This works great until one day I only drive 450 miles. I

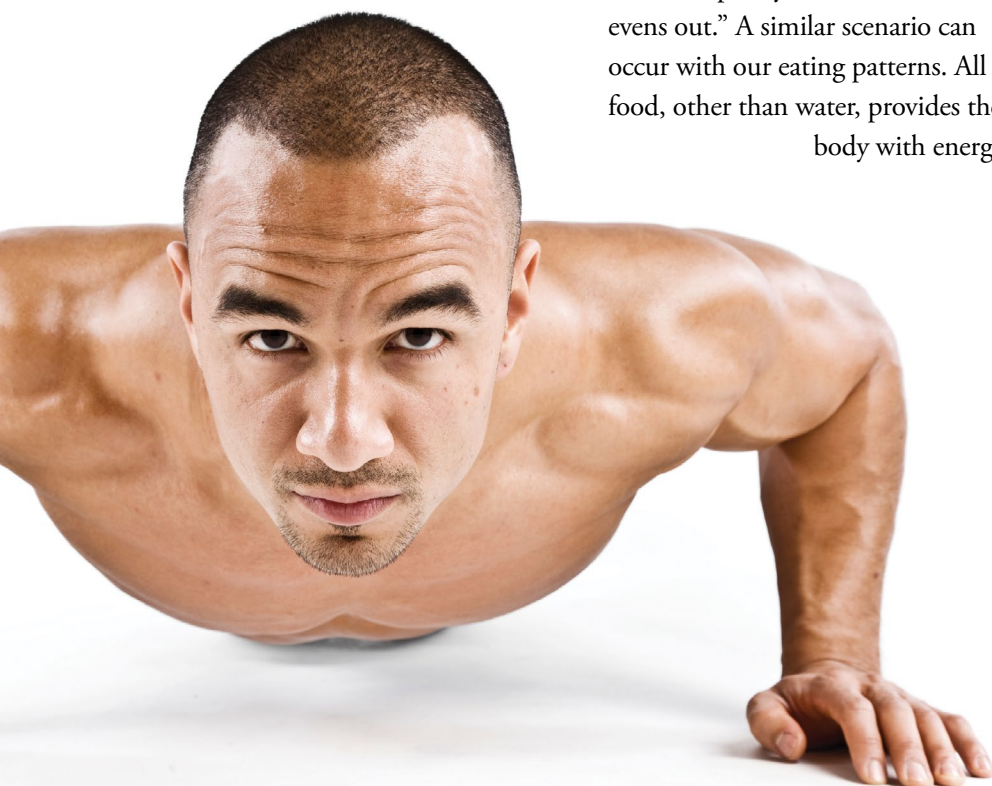
have a gallon of gas left over that I didn't need. Since any daily excess automatically gets stored in my trunk, I think, "No biggie—I don't mind having a little more reserve just in case of an emergency. I have done this plenty of times and it all evens out." A similar scenario can occur with our eating patterns. All food, other than water, provides the body with energy

potential that when left unused, gets stored. The main ingredients of the food we eat can be classified into three broad categories: protein, carbohydrates, and fat. For the sake of simplification, we are going to limit our focus to carbohydrates as they are the most efficiently used to produce energy. Most foods,

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as they are found naturally, are a combination in varying proportions of protein, carbohydrates, and fat. To look at a baked potato and say it is a carbohydrate is partially correct, as we are ignoring the fact that it also contains as much protein as a glass of milk or slice of cheddar cheese. An avocado may seem like it would fit under the fat category, yet half of an avocado has 8 grams of carbs, not very much, but still significant.

Carbohydrates are a crude source for energy, similar to oil being the crude source of gasoline. During digestion, carbohydrates are broken down into glucose. Glucose makes its way via the bloodstream to the various organs and tissues, where it will be transported into the cells to produce energy. At mealtime we fill up the tank. Blood glucose



rises with carbohydrate intake. The glucose then goes through an elaborate process inside the cell in which energy is made according to the need. The extra gets stored. Glycogen and fat are the body's two main storage tanks.

Any glucose not needed right away gets stored mainly in

The amount of glycogen a person can store depends upon their lifestyle, how much they exercise, how they exercise, and what and when they eat. Muscle storage of glycogen has the greatest variation. Increasing a muscle's mass through exercise can double and even triple the amount of glycogen it can hold

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muscles and the liver in the form of glycogen. Glycogen is glucose molecules bound together and packaged up. When the body starts getting low on available blood sugar, glycogen is at hand, ready to get chopped up into glucose to provide the necessary fuel in the face of a looming shortage. From the liver, glycogen keeps blood sugar at a steady level, this is especially critical for the brain. Liver stores may go from 300 grams to 80 grams overnight as glycogen is broken down for this purpose.

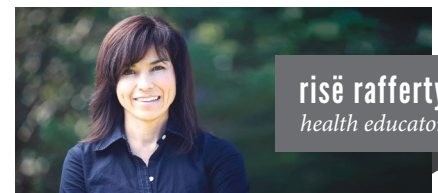
In the muscles, glycogen is at attention, ready to be converted to glucose at the snap of a finger to provide the needed energy for muscle contraction. It is primarily glycogen that fuels the sudden burst of strength required to lift the heavy box that just fell on your toes. It also enables weightlifters to pump iron and marathon sprinters to run the 50-yard dash. It is immediate, accessible fuel.

in store. Muscles that are used to having demands placed upon them by frequent exercise will have larger storage tanks. There are several benefits to having increased glycogen stores. Increased storage can double the duration of exhausting work. It increases the amount of work and the amount of time one can be physically active before perceiving exhaustion. Glycogen stores that are low or depleted place a limit on how intense one can exercise or do physical labor. In other words, the more energy you use up, the more energy you produce, the more potential energy you store, the more energetic you feel.

I am sure you know someone who seems like they can eat like a horse and yet they are not overweight. You wonder, where does all that food go? More than likely, glycogen! You see, another benefit of increased glycogen storage is that more of the excess is used to fill up this tank and less goes into fat

storage. This is what we will address next month.

Scripture says, "There is one who scatters, yet increases more; and there is one who withholds more than is right, but it leads to poverty" (Proverbs 11:24, NKJV). The purpose of storage areas isn't just to keep excess around. There is a fine line between storing for future use and hoarding. God has promised to be the Replenisher, the Supplier of all our needs. Don't ask of Him while still holding on to your well-stocked pantry. By wisely using God given resources, using up what we have kept in storage, our capacity will enlarge and enable us to do double what we thought possible.



Risë has been writing on various health subjects for over 20 years. She has inspired many through her research and down-to-earth writing and speaking style. She believes that healthy living is intimately tied to happiness and wholeness.