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How is Glycogen Used During Exercise?

Physical activity, including formal exercise, requires fuel for energy. Your body stores energy in the form of glycogen, a readily available fuel. The amount of glycogen in your body plays a major role in determining your level of endurance. Without adequate glycogen, prolonged exercise can lead to fatigue and loss of stamina.

The Role of Carbohydrates

Carbohydrates provide the major source of fuel for physical activities. Your body naturally separates glucose from consumed carbohydrates, depositing this form of sugar into your bloodstream, while storing the excess amount of glucose in the form of glycogen.

Glycogen in Tissues

Your liver and your muscle cells are the main storage tissues for glycogen. To store glycogen, your body produces an enzyme known as glycogenin. This enzyme enables the attachment of glucose molecules to muscle and liver cells, where they remain until your body requires them for fuel.

Glycogen Use

Exercise can cause a slight drop in blood sugar, the amount of glucose circulating in your bloodstream. Your body responds to this slight decrease by producing two hormones: glucagon and epinephrine. The liver and muscles react to the hormonal changes by converting the stored glycogen into glucose and releasing this substance into the blood stream for immediate use.

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NOTE: Some sentiments contained within "What We're Reading" articles may not strictly conform with PROJECT: PFC's nutritional outlook. We read articles containing opposing information all the time and derive our nutritional philosophies from the latest science, the opinions of experts worldwide and our anecdotal experiences in the field. We keep an open mind and a strong affinity for fact-based evidence to help make the world of nutrition "Simple Again" for you.

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Improving Glycogen Stores

Your muscles and liver only store enough glycogen to fuel your body for approximately 90 minutes. Intense exercise that lasts beyond 90 minutes can cause fatigue and poor performance. Carbohydrate loading is a method of increasing your glycogen stores and enhancing your stamina. This type of eating plan involves loading up on carbohydrates about one week before you perform in an intense activity, such as a running marathon or long bicycle race. The first step of carbohydrate loading focuses on eating about 50 to 55 percent of your daily calories in the form of carbohydrates, such as grains, fruits and vegetables. After three or four days, you increase your carbohydrate intake to supply about 70 percent of the calories you consume each day. Carbohydrate loading can increase glycogen stores to more than 25 percent, although this type of eating is not effective for everyone. Women athletes may realize fewer benefits than their male counterparts.