

## 5 Critical Considerations for Choosing a Performance Carbohydrate

Over the past decade we have come to understand that protein timing, level and type is critical for maximizing gains resulting from physical training. Simply put, consuming protein, especially essential amino acids, before and/or after training can support maximum protein manufacturing. This allows muscle to become bigger, stronger, more powerful, anaerobic or aerobic depending on the type of training you do. Now its time to turn our attention to carbohydrate and, yes they are okay to eat again. What's more, like protein, carbohydrates are absolutely necessary to optimize performance and training results.

### Five Critical Considerations for a Sport Carbohydrate

1. No Bloating
2. Fast Fueling
3. Rapid Recovery
4. Insulin Increaser
5. Performance Proven

Carbohydrates fuel muscle for serious training and competition as well as aiding recovery when the work is done. Further still, carbohydrates work with protein to maximize positive effects of training on muscle size and performance. As shown in the table, there are numerous carbohydrates found in sport nutrition products such as bars, powders and drinks and it isn't always easy to know which one to use, when to use it or why? This article will change all that by providing you with the *5 Critical Considerations for Choosing a Performance Carbohydrate*.

### 1. NO BLOATING

Whether you train/compete in the gym, on wheels, in the water or on a mountain, it really doesn't matter, bloating is always an unwelcome side effect of sport drinks and other products. Bloating occurs because too much food or drink is ingested prior to or during exercise, or because what we choose to consume pulls too much water into the stomach thereby slowing its movement into the small intestine. The type of carbohydrate you consume can have a big impact on bloating. Smaller carbohydrates such as glucose, fructose, sucrose attract a lot of water, which can lead to bloating and unhurried release from the stomach if too much is consumed. The same goes for corn syrup, high fructose corn syrup and maltodextrin. This is one reason why popular sport drinks are formulated to be only 6-8% carbohydrate. Meanwhile, starch molecules because of their size and design should attract less water and empty from the stomach faster than smaller carbohydrates. For instance, one specially processed sport starch called Vitargo® has been shown in research to empty from the stomach roughly twice as fast as glucose and maltodextrin.<sup>1</sup>

### Examples of Carbohydrates used to Formulate Sport Nutrition Products\*

<b>Glucose</b> <b>Fructose</b> <b>Lactose**</b> <b>Maltodextrin</b>	<b>Corn Syrup (CS)</b> <b>High Fructose Corn Syrup (HFCS)</b> <b>Waxy Maize Starch</b> <b>Vitargo®</b>
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\*Energy Sources

\*\*Typically derived from milk protein sources

### 2. FAST FUELING

Consuming carbohydrate immediately before and during exercise training and competition can enhance performance, especially if you haven't eaten for while.<sup>2,3</sup> The goal here is to provide a carbohydrate that is able to get into the blood and to begin working muscle and the rest of the body quickly enough for efficient and sustained fueling. Glucose, maltodextrins and some

starches such as waxy maize can supply glucose to working muscle in an equally effective manner.<sup>4</sup> Fructose, however, is absorbed more slowly than glucose, so based on this and the possibility of some intestinal discomfort it would not be a good choice for an exclusive performance carbohydrate. However, fructose as part of a carbohydrate blend including glucose or maltodextrin and/or starch can provide a strategic delayed carbohydrate source. This also goes for the fructose found in HFCS, which commonly is 55% fructose and sucrose, which is made up of fructose and glucose.

### 3. RAPID RECOVERY

Once the work is done, carbohydrate will begin the task of rebuilding energy stores called *glycogen* in muscle. Not only will this help prepare muscle to perform again but it will also help keep water in muscle cells which will support the recovery process. Getting a good jump on glycogen recovery is especially important for athletes and fitness enthusiasts that train or exercise more than once a day. This would apply to fitness instructors, multisport athletes (e.g. triathletes) and athletes competing in multi-game tournaments. It is recommended that athletes and serious exercisers consume  $\frac{1}{2}$  to  $\frac{3}{4}$  grams of carbohydrate per pound of body weight depending on when your next meal will be. Sport products (shakes, bars, etc.) are good options to bring in the carbohydrates as soon as possible after training. Look for glucose, corn syrup and maltodextrin as principle carbohydrate sources. Waxy maize starch is also an option but its impact could be less than that of glucose and maltodextrin because it doesn't raise glucose and insulin levels as quickly and potently.<sup>4,5</sup> Vitargo<sup>®</sup>, on the other hand will have a faster impact on glycogen recovery.<sup>6,7</sup> In fact one study demonstrated almost 70% faster glycogen recovery in the first two hours after exhaustive exercise with Vitargo<sup>®</sup> compared to glucose and maltodextrin.<sup>7</sup> As suggested above, a more rapid recovery of muscle glycogen can be an important consideration for athletes that train more than once daily or train or compete hard daily.

#### Blood Glucose and Insulin Increaser Hierarchy:

**Vitargo<sup>®</sup> > Glucose/Maltodextrin/Corn Starch > Waxy Maize Starch > Amylose**

### 4. INSULIN POTENTIATOR

Insulin is a hormone released from the pancreas when blood glucose levels increase and is a critical regulator of carbohydrate uptake into muscle after exercise. In addition, insulin promotes glycogen building in muscle cells. Knowing this, carbohydrates that have the ability to raise insulin levels higher and faster would be more advantageous to muscle glycogen recovery. For instance, based on research findings there is an insulin increasing potency hierarchy of different types of carbohydrates.<sup>4,5,7</sup>

Beyond, glycogen recovery, insulin plays a major role in maximizing muscle protein production. While insulin may lightly stimulate muscle protein synthesis, its main role seems to be to minimize muscle protein breakdown which is elevated in response to a strenuous exercise session.<sup>8</sup> Thus, insulin reduces muscle protein breakdown while protein and more specifically essential amino acids stimulate muscle protein synthesis. The net effect is an increase in muscle protein production which is necessary for changes in muscle size and performance.

## 5. PROVEN PERFORMANCE

There are several products on the market that claim to contain faster and most potent carbohydrates that will optimize performance and recovery. The key factor that will help you sift through the marketing lingo to get to the truth will be to look to real research studies involving the actual products that are available to you to purchase. These studies will help you understand which carbohydrates to use prior to, during and after exercise, why to use them as well as how to confirm marketing claims. Look for research papers on the websites of the brand you are considering or call the company and request that they send you the actual studies performed on people in an applicable athletic scenario on the product that you are considering. Without that kind of proof a brand does not have the substantiation they need to make performance related claims.



### References

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