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(swedish text included in the articel SE)

Setting The Record Straight on the Waxy Maize Craze.

(SE Ren fakta om Waxy Majsstärkelsen- sanning eller myt?)

A Brief History... (Sammanfattning)

The basic concept goes like so: Most people are aware that nutrient timing is as important as nutrient composition. In other words, it's not just what you eat, but when you eat it that gives optimal results. As the man said, "Timing is everything. " Consuming the right nutrients at the right time can have positive effects on body composition, which can equal more muscle and less body fat as well as improved performance.

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(De flesta har nog hört vid det här laget att kosten påverkar dina träningsresultat, äter du näringsrikt och vid rätt tidpunkt kan detta resultera i positiva effekter vad gäller din kroppskomposition.)

Following an intense exercise session, there's a "metabolic window" - so to speak - where the body preferentially shuttles glucose, Amino Acids, and other nutrients, into the liver and muscles via both insulin-dependent and non-insulin-dependent transport mechanisms. Translated, this means your body will shuttle carbs and protein into the tissues you want (muscle) instead of storing them as fat after a workout. So far so good...

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(Efter träning är det extra effektivt att transporteras kolhydrater och protein extra effektivt in i cellerna, istället för att, som i vila, kanske lagras i fettdepåerna.) För de som tränar hårt och ofta är det extremt viktigt att sköta kosten och återhämtningen efter träning – då denna gynnsamma inlagring pågår i upp till 2 timmar efter avslutad träning.)

To carry the analogy further, the metabolic window doesn't stay open indefinitely, so you need to take advantage of the opportunity while it lasts.

A number of studies have found that a post-workout drink containing high-GI carbs** is highly anti-catabolic. Adding protein to the mix – depending on the protein – has an additive effect with the two working synergistically to create an anabolic environment that's superior to either nutrient alone.

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(Ett flertal studier har visat att en återhämtningsdryck med snabba kolhydrater som intas direkt efter träning är anti-katabol – dvs. Uppbyggande- ej nedbrytande)

Obviously there's a great deal more to it, but the above is intended as a quick recap of the concept vs. an exhaustive review on the topic.

Back to Waxy Maize Starch (WMS) (Åter till Waxy majs stärkelsen, WMS)

So with the above brief summary of why the big interest in various carb sources pre and or post workout, we can focus for a moment on WMS. WMS has been pushed heavily as an optimal carb source with sellers claiming superior effects to other common carb sources such as maltodextrin and dextrose. Claims of faster glycogen resynthesis after tough workouts "rapid absorption" and faster gastric emptying, are the common claims made by those selling WMS. I'm sure people have also seen claims about "high molecular weight, low osmolality" and other fancy terms being thrown around also. So is any of this true, or have people been fed another over hyped poorly supported bag of goods? Let's see...

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(Waxy Majs stärkelse har i främst USA tillskrivits enormt positiva egenskaper jämfört med tex maltodextrin och dextros, tex. snabb inlagring av muskelglykogen. Fina termer som osmolalitet och molekylvikt används flitigt i marknadsföringen. Är påståendena sanna – eller är det återigen su som konsument som blivit lurad?

"Just The Facts Ma'am" ("Raka puckar")

One major claim of WMS is "rapid glycogen" storage after exercise compared to

other carbs. One study compared WMS to dextrose, maltodextrin, and a "resistant"*** starch. 8 male cyclists were put through a workout designed to deplete their glycogen stores**** so their muscles would be primed for glycogen storage as mentioned above in the "Brief History" section. Furthermore, after feeding them these various carb sources - at 24 hours after the glycogen depleting workout program - glycogen levels were essentially the same between the WMS, dextrose, and malto. In fact - although not statistically significant - dextrose was the best of the bunch in this study for getting glycogen levels back up after the exercise protocol (1) which is what athletes should strive for after tough workouts.

Another big claim of WMS is as a pre workout carb source, but is it any better than, say dextrose? The answer appears to be NO. Ten well trained, elite male cyclists were given either WMS, dextrose, resistant starch (RS), or placebo, and their ability to sustain endurance work after ingesting these carb sources and placebo tested. Performance during prolonged endurance exercise is related to the ability to maintain blood glucose levels via glycogen storage and ingested carbs before and or during the exercise. So, these researchers wanted to see which of these carb sources consumed pre-exercise would maintain performance during prolonged exercise. That is, which carb source would fuel the greatest amount of work in the final 30 minutes. First, they gave the cyclists (at separate times) each of the carbs (about a 75 gram dose) 30 minutes before their 2-hour ride. The blood glucose and insulin response from dextrose was 3 times higher in the first 15 minutes; at 30 minutes glucose was still over 1.5 times higher while insulin remained 3 times higher. Then they did their exhaustive ride. The study found dextrose and WMS similar (although dextrose still had a slight edge) in their ability to maintain performance with RS and placebo being less effective (2). Again, WMS did not show itself to be anything special and slightly less effective then good old dextrose. This also is the first study (of several—see more below) to show WMS to be low glycemic and low insulinemic (low insulin spiking).

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(I studier på Waxy majs stärkelse har inga resultat kunnat visa att det är effektivare än maltodextrin eller dextros – snarare tvärtom. Det man kunde se var indikationer på låg insulinrespons, vilket innebär att man druckit en lågglykemisk dryck, långsam kolhydrat, inget man bör använda som återhämtningsdryck efter träning. En glykogenstudie(återinlagring) efter träning visade att dextros var effektivare än Waxy majs stärkelsen, så varför använda produkten?

"So Why All The Hype, Will?" (Så varför all denna uppståndelse?)

So at this point the reader is thinking "then why all the hype over Waxy Maize, Will? Where is all this info coming from about this carb source being so great if it's not so great?!" I feel your pain and will answer your questions! This is where things get more interesting.

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(Varför denna uppståndelse över denna produkt? Varför skriva upp en produkt till skyarna om den inte fungerar? Vi har svaret på frågan...

The Real Deal... (The real deal- kungen av kolhydrater)

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En optimal dryck att inta före och efter träning avseende snabb återinlagring av muskelglykogen, snabb magtömning och förbättrad prestation existerar faktiskt, den har hög molekylvikt och låg osmolalitet och höjer blodglukos- och insulinnivåer efter träning. Kliniska studier har visat detta – kolhydraten är patenterad och säljs under namnet Vitargo. Vad de som säljer WMS gjort – är klart och tydligt - använt sig av data och påståenden från Vitargo och överfört det till sin egen produkt. Ej så pålästa konsumenter tror då att det rör sig om samma kolhydrat – vilket det inte är. I bästa fall är WMS likvärdigt med dextros och maltodextrin, en ny studie på WMS fann att tom vitt bröd gav dubbelt så hög insulinrespons än WMS! Så tom vitt bröd verkar vara bättre att äta efter träningen jämfört med WMS.)

A carb source that has an optimal pre and post workout profile for the resynthesis of glycogen after tough workouts, fast gastric emptying, and improved performance, has a high molecular weight and low osmolality and should spike blood glucose and insulin levels post workout. Studies suggest the best of the bunch for this purpose is a patented carb sold under the name **Vitargo®**. What sellers of WMS have unknowingly (some might suspect knowingly...) done is use the data and claims from Vitargo and applied them to WMS, as if the two were interchangeable, with some getting the impression WMS is just a generic form of Vitagro, which is not the case. For example, sellers of WMS claim it's absorbed

rapidly, increases glycogen stores quicker than other carb sources, and improves performance (similar to Vitargo), but the studies that exist do not support that (or show the opposite…) and or simply don't exist to support it as the studies above clearly demonstrate. What does exist, however, are studies showing Vitargo to have these effects. As I said, it appears sellers of WMS have "pirated" the studies actually done on Vitargo as if they were interchangeable carbs sources, when they are not. As already shown, WMS is, at best, about equal to maltodextrin and dextrose, or inferior to those carb sources, depending on which study you read. For example a study just completed –and soon to be published- out of Purdue University, found WMS had a 3 times lower glucose response compared to maltodextrin, and a 3 times lower insulin response, and even 2 times lower than white bread! (3) So even white bread appears to be a superior post workout carb source than WMS if one is looking to spike glucose and insulin levels, which leads to enhanced rates of glycogen storage and anti-catabolism. It's interesting to note that WMS has been shown to have such a slow and steady effect on glucose and insulin levels, scientist now routinely refer to it as "slow digesting" or "low glycemic."

So What Of Vitargo? (Fakta om Vitargo)

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Vitargo är en intressant stärkelse-kolhydrat med unika egenskaper. Den återinlagrar glykogen 70% snabbare än maltodextrin/dextros-blandningar och har en 80% snabbare magsäckstömningshastighet! Inga små siffror minsann. Allt bevisat i kliniska oberoende studier. Forskarna menar att det inte går att beskriva på ett enkelt sätt varför Vitargo har just dessa egenskaper, varken glykemiskt index eller snabb/långsam kolhydrat kan beskriva varför Vitargo fungerar så väl. Det är en massa andra faktorer som påverkar ämnesomsättningen – och vetenskapen är på god väg att lära sig förstå mekanismerna.

Vitargo is an interesting starch carbohydrate with some interesting properties. A study published in 2000 compared Vitargo to maltodextrin plus sugars and their respective effects on glycogen storage after an exhaustive exercise protocol and found Vitargo to be far superior to malto/sugars for rapidly replacing muscle

glycogen levels both two and four hours after the exercise sessions (4). By “far superior” I mean 70% better over the 2 hour period, which is no small amount.
A follow up study published in 2008 found similar effects, but with some additional twists in support of Vitargo as a unique carb source. This study found that Vitargo was superior for performance during a subsequent bout of maximal exercise just 2 hours after glycogen-depleting exercise. In a nut shell, on three randomized visits 8 guys were put through an exercise protocol designed to use up a bunch of their stored glycogen (ergo, they were glycogen depleted), and then fed 100g of either Vitargo, malto/sugars, or flavored/artificially sweetened water as control. They waited 2 hours and tested their performance (ability to do “work”) via a 15 minute high intensity time trial test on a cycle ergometer and found the group that had been fed the Vitargo right after the prior workout 2 hours before had superior performance for the second high intensity trial. This makes perfect sense; if Vitargo rapidly replaces glycogen levels in muscle and the liver, the person will be able to perform better during their next exercise session, especially if those bouts of exercise are within the same day. If glycogen levels are not boosted back up by the next exercise session, performance will suffer. As the authors of this study summarized well:

“Limiting factors to post-exercise muscle glycogen re-synthesis following carbohydrate feeding include the amount, timing, and form of carbohydrate administered, the rate of gastric emptying and intestinal absorption of the ingested carbohydrate, glucose storage and output by the liver, and muscle glucose transport and oxidation.”

Translated, it’s not as simple as just the carbohydrate’s glycemic rating or whether it’s a “simple” or “complex” carb. There are a lot of other factors involved and science has come a long way in understanding what those biological factors are.

Gastric emptying rates are another important issue to athletes as the faster it leaves the stomach the faster it enters the intestines where it is digested and

absorbed. Fast gastric emptying and digestion means the faster glucose levels, insulin spikes, and subsequent glycogen storage and enhanced post workout anti-catabolic action, not to mention no one enjoys having a drink sloshing around in their stomach during or after a workout. It's just unpleasant and if it's sloshing around in your gut it's not doing squat for your muscles! A 2000 study compared the gastric emptying rates of Vitargo to a carb source derived from maize starch and found Vitargo "significantly" faster emptying rate from the stomach, which would partly explain why Vitargo appears to replenish depleted glycogen levels so quickly when compared to other carb sources (5).

Conclusions (Sammanfattning)

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Jag har försökt hålla mig till vetenskaplig fakta i denna artikel, inget mumbo-jumbo. Så vad kan vara användbart för dig som idrottare att ta med och använda i din dagliga träning?
Det krävs inget högre intellekt att förstå att Vitargo är den absolut bästa före/efter-drycken avseende kolhydratkvaliteten.

- Tränar du ofta och hårt/ är elitidrottare eller dylikt, rekommenderar jag Vitargo som ditt kolhydratval.
- - Tränar du för att få ett friskt allmäntillstånd, någon eller några gånger per vecka, högst 1 timme per träningstillfälle – är det tveksamt om Vitargo ger fördelar gentemot traditionella kolhydrater. Detta är inte undersökt.
- Letar du efter bästa tänkbara ekonomiska inköp brukar dextros eller maltodextrin vara billigare alternativ till Vitargo
- Vill du ha den effektivaste kolhydratkällan som finns idag för idrottare, föreslår jag att du provar Vitargo. WMS, Waxy majs stärkelse däremot, kan jag inte rekommendera till någon…

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Jag förstår att konsumenter är förvirrade i Vitargo /Waxy majs stärkelse-frågan. Jag förstår också att WMS-kosttillskotten vill använda sig av de effekter Vitargo ger i sin marknadsföring. Det är också så att Vitargo kan tillverkas från WMS, potatis, majs, korn, ris mm, så det borde väl innebära att WMS motsvarar Vitargo? Nej, Vitargo är en väldigt annorlunda produkt än WMS, och i patentet gällande Vitargo kan man läsa:

"vi har funnit att det förekommer nya typer av bindningar i Vitargo, som inte förekommer traditionellt i nativ stärkelse. Med detta menas, Vitargo är en stärkelsetyp som inte förekommer i

naturen och Vitargo är strukturellt och funktionellt annorlunda från stärkelseråvaran från produktionens början. En sann ”design-stärkelse” kan man säga, optimerad för att ge snabb kolhydratinlagring!

In the above review, I was trying to keep the science mumbo jumbo to a minimum. So what's the take home on the above?

• For endurance athletes and people following multiple sessions per day in the gym, Vitargo is a no brainer as the pre/post workout carb source of choice. For those focused exclusively on gaining lean body mass (LBM) and strength, doing traditional programs where a single exercise session is done in day lasting an hour or less, it's unclear at this time if Vitargo is going to have additional benefits on body composition above and beyond what malto or dextrose can achieve as this has not been studied. In theory however, faster gastric emptying, higher and faster insulin spikes, and enhanced rates of glycogen resynthesis, etc., should be beneficial to strength athletes following traditional programs, but more data is needed. Bottom line here is if I was looking for the least expensive carb source pre/post workout, I would use malto and or dextrose. If I wanted to use what appears to be the most efficient carb source that data suggests has superior properties for athletes, I would use Vitargo. WMS however is a bust and would not even be in the running between those choices in my view.

• It's easy to see why people are often confused regarding WMS vs. Vitargo, and why sellers of WMS have taken advantage of that fact. Vitargo can be derived from WMS, so they are essentially the same thing right? Wrong. Vitargo can be derived from WMS, potatoes, rice, wheat, and other sources, so even if WMS is used as the starting source, it's a very different starch as the finished product. If one reads the patent on Vitargo***** there is a very interesting statement made which is on testing, “it will be found there have occurred novel types of bonds which do not occur traditionally in native starch.” What that means is, it's a starch not normally found in nature and is structurally and functionally different than the starch source it was derived from. A true “designer starch” if you will, which appears to be

optimally designed to favor the rapid formation of glycogen.

The Brink Bottom Line: More data is needed in my view on Vitargo to answer some lingering questions, but it's one of the few products out there with more substance than sheer hype (which is more then can be said for WMS...) with Vitargo firmly in the "might be worth a try" category hovering on "definitely worth using" if/when additional studies are done to confirm/support some of my previous comments and questions above.

See you in the gym....

Citations:

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(4) Piehl K. et al. Muscle glycogen resynthesis rate in humans after supplementation of drinks containing carbohydrates with low and high molecular masses. Eur. J. Physiol. 81: 346-351. 2000
(5) Leiper J. B. Improved Gastric Emptying Rate in Humans of a Unique Glucose Polymer with Gel-forming Properties. Scan. J. Gastroenterol. 11: 1141-1149. 2000

Notes:

* = Anadrol, the brand name for a powerful oral anabolic steroid.

** = The GI of a carb is not the only factor responsible for the benefits of various

post/pre workout carbs.

***= A “resistant starch” is resistant to digestive enzymes that break down starch into glucose for absorption. This study used a resistant starch that was 100% pure amylose.

**** = 60 min cycling at 75% VO2 max followed by 6X 1min sprints at 125% VO2 max with 1 minute rest between sprints.

***** = US Patent # 5,929,052

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