Finally, Evidence that Maurten’s Hydrogel Sports Drink Works

A new study suggests that hydrogels enable you to down more carbs with less digestive distress, and race faster as a result.

Back in 2019, I wrote an article titled “[The World’s Hottest Sports Drink Faces the Evidence](https://www.outsideonline.com/health/training-performance/maurten-sports-drink-research/).” The Swedish company Maurten’s hydrogel-carbohydrate drink had swept through the endurance sports world like a highly transmissible viral variant—but the first few independent studies had failed to find any performance benefits compared to plain old carbohydrate sports drinks.

That was still the situation until last month, when Henrik Wingstrand, one of the company’s co-founders [tweeted](https://twitter.com/HenWing) “It's here!!!!! The data we have been waiting for since we started Maurten five years ago.” The object of Wingstrand’s enthusiasm was [published in *Medicine & Science in Sports & Exercise*](https://pubmed.ncbi.nlm.nih.gov/34334720/) by [Joshua Rowe](https://twitter.com/joshuarowe4?lang=en) of Leeds Beckett University and his colleagues, and it more or less confirms everything that Maurten (and its many elite-athlete fans, [like Kilian Jornet](https://twitter.com/kilianj/status/1425148773307666439)) claimed over the years. Are there caveats? Sure. But the new study is impressive enough to revise my view of the evidence.

Let’s get the first question out of the way right from the top: the study wasn’t funded by Maurten. Back in 2017, after [Eliud Kipchoge’s first Maurten-fueled sub-two marathon attempt](https://www.outsideonline.com/health/training-performance/nike-breaking2-runners-lab-data/), Rowe got in touch with Maurten to ask how they made their hydrogel. He wanted to run a study that would precisely track how and when the ingested sports drink was burned in the body, which involves labeling some of the carbohydrate with a special carbon isotope. That meant he couldn’t just use over-the-counter Maurten. But the company was still in the process of securing patents for their technology, so they wouldn’t give him any details. Instead, Rowe told me, he spent six months in the lab churning through 178 prototypes until he came up with a hydrogel recipe that worked. Maurten had no role in the study, and didn’t see the results until they were released publicly—which explains Wingstrand’s delight.

The main goal of a hydrogel beverage is to enable you to drink lots of carbohydrate during exercise without triggering [gastrointestinal symptoms](https://www.outsideonline.com/health/training-performance/exercise-gut-research-2021/). For more details on how that works, check out my [previous article](https://www.outsideonline.com/health/training-performance/maurten-sports-drink-research/), but the gist is that surrounding the carbohydrate with hydrogel allows it to exit from your stomach into your small intestine more quickly, reducing the chances of GI upset and speeding its absorption into the bloodstream where it can be used as fuel for your muscles.

That’s the theory; the question is why previous studies—a half-dozen of them, according to [a review](https://journals.humankinetics.com/view/journals/ijsnem/30/5/article-p305.xml?content=abstract) co-authored last year by Rowe along with [Andy King](https://twitter.com/andyjking?lang=en) and [Louise Burke](https://twitter.com/louisemburke?lang=en)—didn’t see it happening. There are a bunch of possible reasons. Probably the most important is that most of the previous studies simply didn’t trigger very many GI problems, even in the non-hydrogel groups. It’s hard to improve something that doesn’t really need improving. Rowe’s study used running rather than cycling, which is more likely to jostle the stomach. It also used a faster pace for the exercise test, close to marathon race pace (68 percent of VO2 max) for two hours followed by an all-out 5K time trial. And it used a more concentrated 18 percent carbohydrate drink, compared to about 16 percent for the strongest Maurten drink. As a result, more than half the subjects had problems like bloatedness, cramps, and flatulence with the non-hydrogel version of the drink.

The nuts and bolts of the study: 11 experienced male runners completed the two-hours-plus-5K protocol three times. In one of the trials, they drank Rowe’s custom hydrogel drink at a rate 90 grams of carbohydrate (a mix of glucose and fructose) per hour, which is pretty much the most you can possibly absorb. In another trial, they drank an identical carbohydrate drink without the hydrogel ingredients, and in the third trial they drank an artificially sweetened placebo. The blinding was good enough that only 3 of the 11 subjects correctly guessed what order they’d done the trials in. (The hydrogel doesn’t turn into a glutinous gel until it reacts with the acid in your stomach.)

The big result, from a performance perspective, is that the runners were 7.6 percent faster in the 5K with the hydrogel than with the placebo—and, more relevantly, 2.1 percent faster than with the non-hydrogel carbohydrate drink. The runners had roughly the same frequency and severity of GI symptoms with the hydrogel and the placebo, but more with the non-hydrogel drink. That suggests that the high dose of carbs (in combination with the particular exercise protocol) did cause digestive issues, and that the hydrogel could reduce or eliminate them.

Thanks to the carbon isotope labeling, there’s a whole bunch of data on exactly what types of energy the runners burned, and from where. The most important point is that the runners burned more “exogenous” carbohydrate (meaning from the sports drink rather than from the body’s internal stores) when they drank the hydrogel drink: 68.6 grams with the hydrogel drink compared to 63.4 grams with the non-hydrogel drink. This fits with the idea that the hydrogel enabled the sports drink to exit the stomach and get into the bloodstream faster.

You don’t necessarily want to fall into the trap of saying “Hey, this one positive study trumps the other six negative ones.” Assuming these results can be replicated in other labs, the next question will be figuring out which variables made this study different from the others. Does hydrogel only matter above a certain intensity or beyond a certain duration? Does it only help for running and not cycling? Is it only useful if you’re pounding down very high amounts of carbohydrate like 90 grams per hour? Or is it useful in a wider range of contexts, but the effects are only big enough to be obvious under these specific circumstances?

Rowe notes some other lingering questions. Are the effects different in women, who by some accounts are more likely to report GI problems during exercise? Can you tweak the hydrogel recipe (which is made from pectin and sodium alginate) to alter the effects? Could hydrogels also help non-athletes deal chronic GI conditions? In other words, this study isn’t the final word on hydrogel research. It’s more a beginning than an end. But it’s a solid enough study, in my view, to shift the wild popularity of Maurten among endurance athletes from the “wishful thinking” column most of the way over to the “seems reasonable and has some evidence behind it” column.

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