



This newsletter is brought to you by YouTube replays, slushy messes turning into skating rinks, and quality time with my spreadsheets. If you enjoy it, I'd be grateful if you could share with one or two others!

Reminder from last week: a [recent article](#) in *Environmental Science and Technology Letters* reported high levels of PFAS in several watch bands. If you have a watch band made of fluoroelastomer or "synthetic rubber," you might want to consider switching to pure silicone.

Record-setting!

"I really want to focus on being unapologetically myself, doing the stuff I want to do, not caring what people think about it and always being me because I'm the only person who can be me." -- [Yared Nuguse](#), previous mile indoor track world record holder (Jakob Ingebrigtsen broke it 5 days later).

The 1500m, 1 mile, 3k, and 5k indoor track records went down last week. The half marathon record was also reset. We're getting faster, equipment is enabling us to go faster, and supplements like bicarb might be making a difference. This is all exciting, but there are also people behind these things, and I love getting glimpses into their minds.

Coaching snapshot: bicarb hype!

Sodium bicarbonate ("bicarb", the equivalent of baking soda) came up in conversation a wild number of times this week, so I thought I'd bring some the conversation here. *Kind-of curious about your thoughts on sodium bicarb?*

As a coach, I think there are many ways of getting fast that come before using supplements like bicarb. As an athlete, I'm intrigued and would love to try it (though it's quite expensive in the most GI-friendly form!).

To contextualize bicarb, let's talk about muscular fatigue for a second. The sensation of fatigue and muscle ache when you're doing high intensity efforts can be attributed, at least in part, to the build-up of certain metabolites, like [hydrogen ions](#), lactate, and ATP. In this [cool study](#), these metabolites were injected into subjects' thumbs at certain ratios associated with increasing exercise intensity. Researchers found a dose-dependent fatigue and pain response when they were injected together (interestingly, one alone was insufficient to induce the muscular fatigue feeling).

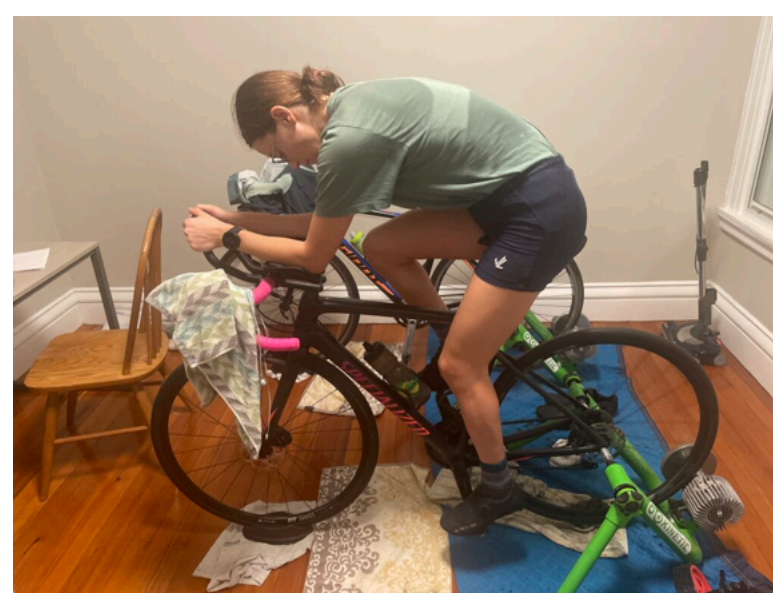
[One theory](#) for how sodium bicarbonate improves performance is that it helps remove [hydrogen ions](#) that are contributing to the sensation of muscular fatigue. Some of us may recall this equilibrium equation from Chemistry class:

carbon dioxide + water <--> carbonic acid <--> [hydrogen ion](#) + bicarbonate

At higher exercise intensities (think hard exercise lasting under 1 hour), we process carbohydrates and produce energy (ATP) along with lactic acid (lactate + [hydrogen ions](#)). If there's [bicarbonate](#) waiting around ready to pick up [hydrogen ions](#), fewer will build up, and there will be a lower sensation of muscular fatigue at the same output.

Ultimately, this allows athletes to train at higher outputs, and months of stacking higher outputs --> gains!

In the research studies mentioned below, researchers measure participant blood bicarb levels and have them start the time trials when it peaks. Usually, this is around 60-180 minutes after ingestion (and that's why it's [recommended](#) to take it 1-3 hours before).



A few recent studies have demonstrated the efficacy of bicarb on performance:

- A [2023 study](#) in the *European Journal of Applied Physiology* studied acute bicarb supplementation on 2k erg performance in eleven female CrossFit athletes. (Wow, female athletes and a rowing study?!) They found improvements of over 2% (think 4-8 seconds) in 2k performance with supplementation at 0.3 g/kg bodyweight compared to a placebo.
- A [2024 study](#) studied the effects of acute bicarb supplementation on a 40k cycling time trial in fourteen male amateur cyclists. They found improvements of about 1-2% (think 40-60 seconds) with supplementation at 0.3 g/kg bodyweight compared to a placebo.

Of note, pro athletes are using bicarb in longer races even though studies haven't evaluated its use during long-distance events. There are also downstream effects of the hydrogen ion buffering that may be beneficial, like delayed contractility fatigue, regulation of intramuscular potassium, and permissibly higher lactate levels. Another theory there is that the salt intake may help with hydration.

As always, check with a doctor before using bicarb. Think about how it interacts or works with the other supplements you may be taking. Among things related to the kidneys and heart, there are also a number of [drug-drug interactions](#) to look out for.

Reply to this newsletter or [email me](#) with questions, and I'll answer one in a few weeks!

Let your friends know that I'm taking more athletes! Send them to my [website](#) to submit an inquiry or just pass along my email. Thank you so much!

Sourdough pancakes!

Last week there was an [oat pancake recipe](#). This week, I'm revitalizing a dying sourdough starter, so I'm ending up with a lot of discard. One way to use it is in pancakes! This recipe is adapted from the [Little Spoon Farm website](#).

Ingredients: night before -- 200g starter, 240g buttermilk (I've also used oat milk with vinegar), 50g sugar, 4 tbsp butter or oil, 1 tsp vanilla, 240g flour; in the morning -- 2 eggs, 1 tsp baking soda, 1 tsp baking powder, salt.

Mix together the ingredients for the night before. Let sit at room temperature overnight. In the morning, add the morning ingredients. Let batter rest 20 minutes. Cook on buttered frying pan until the top starts to bubble, then flip and cook on the other side.



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