



This newsletter is brought to you by homemade gnocchi, falling leaves, and crunchy tendons! If you enjoy it, I'd be grateful if you could share with one or two others!

Rim to River 100!

I finished my first 100-mile trail race in New River Gorge National Park in West Virginia this past month, and I'm already looking forward to the next one! Full race report is up on my blog!



Excerpt:

"In this section there was a distinct long straight dirt road where I could see a few people far ahead. It was a slight uphill, so I ran it, and I counted steps: 50 steps, sip of drink mix, 50 steps, sip, 50, sip... until the hill was over. I actually started feeling a bit better after this and ended up running the next smooth downhill section, which was a huge morale boost. I came into the aid station at mile 53 pretty happy. I'd also set a 50-mile PR, which was fun. I took my pack back, this time with night gear in it too, and was off again. It was refreshing and exciting to be heading back toward the start/finish line!"

[Race report here!](#)

Coaching snapshot: protein utilization during exercise!

At what intensity and time duration does protein become a source of energy during endurance exercise?

At rest, we use sugar, fat, and protein to create energy. In fact, protein metabolism accounts for roughly [15% of our resting total energy expenditure](#), while sugar contributes 55% and fat contributes 30%. Proteins are made up of amino acids, and it is the amino acids, primarily leucine, isoleucine, valine, and alanine, that can be used indirectly to make energy (ATP).

There are several methods used to estimate protein metabolism: tracing stable isotopes such as ¹³C-leucine; estimating nitrogen balance by recording protein intake and excretion; and taking muscle biopsies to measure protein content are the most common ones.

A [2025 meta-analysis](#) found that for exercise intensities at 30-70% of Vo2max, or easy to moderate efforts, protein's contribution to energy was constant, averaging around 3.3% of total energy production. Amino acid oxidation during exercise approximately doubles compared to at rest to about 1.8 mg/kg/min. For example, a 70-kg athlete doing two hours of endurance exercise at 60% of Vo2max, or what might feel like a steady effort, would use about 12.4 grams of protein. [One rowing study](#) looking at the metabolic cost of racing a 2k (around 100% of Vo2max), protein metabolism was explicitly left out of the equation due to its negligible contribution.

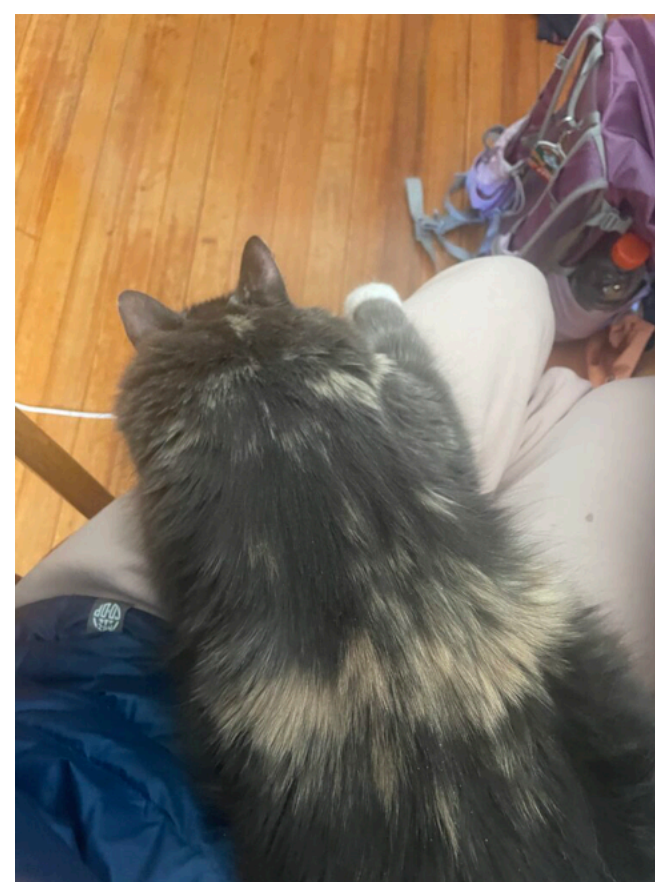
Few studies have looked at performance outcomes (also all in trained male athletes), with [one study](#) finding no difference in 80k cycling time trial performance when fueling with carbohydrates alone compared to carbohydrates and additional protein and [another](#) finding no difference in 100km ultra running performance. However, [some studies](#) have found increased whole-body protein synthesis during exercise (not necessarily reflective of *muscle* protein synthesis!), protein oxidation during exercise, performance, and muscle recovery even with isocaloric fueling conditions. [The best thing to do for muscle protein synthesis is to have enough protein immediately after exercise and throughout the day!] And [one study](#) found that cyclists drinking a carbs + protein mix had improved next-day leg extension muscular endurance (reps at 70% of 1RM) compared to cyclists drinking a carbs-only mix.

Gu Roctane energy gels contain 1.4 grams of amino acids. Naak drink mix contains 8 grams of protein per serving. Some Muir energy gels contain 5 grams of protein. I think consuming protein-containing energy sources during long events like ultramarathons or multi-day events makes sense. Over the longer time frames, it may be that a protein source could help kickstart muscle protein synthesis or at least help you hit daily protein intake, all assuming you've practiced and your gut is accepting! Remember, this frontier hasn't been well-studied, so this is fully my opinion.

Reply to this newsletter or [email me](#) with questions, and I'll answer one next time! It'll be a coaching snapshot or a recipe, stay tuned :)

Hi from Ramona!

Ramona spent some time at her cousins' house this past weekend and was photogenic!



When we got home she was happy to see us. She even sat on my lap, which is unlike her!

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