Hi Fellow Runner,

To drink protein mid-run or not to drink protein mid-run? When it comes to marathon nutrition, there is no simple answer and there are heated arguments on both sides of the debate.

Depending on who you talk to, you may leave a conversation convinced that your performance sports drink must be infused with a 4:1 ratio of carbohydrate to protein, thus maximizing your performance and muscle recovery.

Talk to someone else and you'll leave feeling that carbs are all you need and extra protein is just a waste.

Both sides present stats for a convincing argument, but let's back up for a moment to cover what nutritionists and experts on both sides of this debate CAN agree upon.

What we *can* agree on about protein and marathon training

Protein has proven to be a more formidable macronutrient for endurance athletes than previously thought in decades past.

Even as late as the 90's it seemed carbs ruled the world in terms of distance running and endurance events. Certainly glycogen is a necessary fuel, but we now know it shouldn't be made the holy grail of fueling options.

Things started to shift when sports scientists started to realize just how powerful a muscle-builder protein was. Protein *immediately following a workout*, when combined with carbohydrates, upped muscle recovery by up to 60-percent.

Based on this research, endurance athletes everywhere began switching the ratio of their plates, and for good reason.

Protein throughout the day and immediately following exercise will aide recovery after workouts, help achieve and maintain ideal body composition, and increase satiation after meals.

But what about protein during a run? Can that boost performance?

The initial research on protein as a supplement *during* a race

The boat started rocking when Dr. John Ivy, sports scientist at the University of Texas, claimed to have proof that ingesting protein during exercise would enable an athlete to workout harder, for longer, and recover better afterwards.

Reading like a magic trifecta to the endurance athletes of the world, sports physiologists were interested but also responded with raised brow.

Counter arguments were that the study's findings were less of a result from adding protein to a mid-workout drink mix and more from just adding more total calories to the drink.

The participants given the carbohydrate and protein combined supplement had the same amount of total carbohydrates as the carbohydrate-only drink group. Therefore, the protein naturally added a bump in net calories.

Another point of contention in refuting Ivy's findings is that protein is more difficult to digest and takes longer to be broken down by the body and thus utilized for energy.

Taking in protein won't result in the same immediate surge of energy from that of a quickly digested glucose source, a diabetic can attest to that. Extrapolating then, if your workout is done in roughly an hour, would the ingested protein even have time to be assimilated and burned?

Still, Dr. Ivy persisted that yes, protein makes a difference. Holding firm to the results of his study indicating that the carbohydrate plus protein drink resulted in participants outperforming their carb-only counterparts by 24 percent.

Protein as an energy source

Traditional write-ups and reports have tended to only emphasize two sources of energy drawn upon during exercise: carbohydrates and fat.

A body, while running, will first look to burn energy from any immediate fuel that was eaten.

After that it will turn to fat stored in the body, and finally to glycogen previously present in the muscles. The exact rate of this transition and the percentage from each are also dependent upon exercise intensity.

However, the water is murkier on where protein fits into that equation.

Amino acids, that which make up protein, are more complex and difficult to break down than the other macronutrients.

Now, the body can start breaking down those amino acids found in the muscles and converting them into glycogen, but it's kind of viewed like a last resort. This is referred to as "going catabolic".

Catabolism is when the muscles are being broken down, destroyed and 'eaten' to produce the necessary energy to perform…not alluring to an athlete aiming to build strength and muscular output.

"To my knowledge, a few studies have demonstrated a performance benefit when carbs and protein are combined in a sports drink or gel (compared to plain carbs), a larger number of studies have demonstrated no benefit, and *no* study has ever shown that ergogenics without protein outperform those that have it," explains sports nutritionist, endurance expert, and author, Matt Fitzgerald.

The second part of that sentence is worth emphasizing: there hasn't been any study showing that a sports drink containing protein in addition to carbs, taken during exercises, will have any adverse effects.

Similarly, there is no evidence that a carbohydrate-only drink will perform better than one with the added protein.

In this regard one may be lead to reason: “Well, if there’s nothing to be lost by adding protein to my mid-run drink, and there may be a benefit, why not?”

Protein and potential GI issues during a run

A common question among runners pondering whether or not to include protein during their workout is of course, “Will this cause a GI nightmare?”

Unfortunately, yes it can.

The problem with protein is that it has to go through a digestive process which requires your blood to be re-routed back to the stomach and intestines. This reduces the amount of oxygen rich blood available to your muscles, thus impacting performance.

Moreover, when you are performing aerobic activity like running a marathon, the blood supply to your stomach is shut down so that more blood can be supplied to your working muscles. With less blood available in the stomach, the protein has a higher chance of not getting digested, leading to serious GI issues.

Protein is also known to inhibit gastric emptying, thus slowing rehydration and possibly causing “sloshing” and stomach discomfort. Drinks without protein, fats or fiber are able to be absorbed through osmosis, thus eliminating the digestive processes and associated blood requirements.

What to do if you do decide to use protein in your marathon beverage or fuel

Since the research isn’t entirely clear, it’s really a personal decision on whether you should take protein during your marathon.

Personally, since the research isn’t substantive and there is the potential for stomach issues, I’d avoid it.

But, if you do decide to use protein during the race, how much should you take?

How much protein mid-run?

Regardless of where you stand on the issues, let’s get some specifics on just how much protein these studies are adding to the combination.

Dr. Ivy put his carbohydrate plus protein participants at a 4:1 ratio of carbohydrate to protein. Other studies have issued reports with a 6% carbohydrate and 2% protein mixture.

My advice is to start with a 4 to 1 ratio since it’s the easiest to measure. If that works well for you, great. If you decide you want to try taking a bit more protein, you can try a 6% and 2% mixture.

The bottom line

With most everything training related, it all comes back to what works best for you.

Therefore, you need to experiment and practice.

At the same time, trial and error should be constrained to what science is able to suggest; start with the science and let it guide you down the path to your personal best.

Thank you again for reading and hope you enjoyed today's lesson! In our next email, we're start getting specific with fueling advice for your race!

Coach Jeff