



This newsletter is brought to you by orange leaves, rain, and 40 single-leg calf raises a day. Enjoy!

Trail celebrations

Some people celebrate with champagne, some with color powder, some with data dumps.

Tara Dower (trail name: "Candy Mama") set the overall (any gender) fastest-known-time (FKT) on the Appalachian trail (in any direction) this past weekend [in 40 days and some-odd hours](#). That's over 50 miles a day over some quite rugged terrain! She raised money for [Girls on the Run](#) and celebrated with midnight champagne.

[Mammoth Trail Fest](#), led by legendary trail runner Tim Tollefsen, was a celebration of trail running. It was part of the Golden Trail Series (a series of short-course races throughout the summer that culminates in the Grand Final in October). The "[tenkay](#)" race took place in the dark, with glowsticks, costumes, and color powder as highlights! There was also a solid showing of adaptive athletes, including [Nicole Van Kuilen](#) and [Zachary Ryan Friedley](#).

Kilian Jornet completed his Alpine Connections journey a couple weeks ago, and it would be amiss not to mention this. He bagged 82 4,000-meter peaks in the Alps in only 19 days by biking, running, hiking, or climbing. You can check out some of his data (and tons of other athlete data) in the Coros Training Hub [here](#). For more Kilian data, check out [this paper](#) recently published in *Sports Medicine* on his physiological states before and after UTMB in 2022. Remember, all these things are individual data points, and all athletes are different. Do not compare yourself!

Coaching snapshot!

For some quality downhill running technique, check out these absolutely insane two videos of Elhousine Elazzaoui and Philemon Kiriago racing the past two weekends: 1. [Mammoth Trail Fest](#) (photo excerpt to the right); 2. [Headlands](#). I'm still working on how to maybe get video in an email here... but these are so worth the watch!!

Question: "Why do I have to practice downhill running if I'm mostly worried about the uphill in my upcoming race?"

Downhill running places some otherwise-unseen stress on the body that would drastically undermine your uphill performance if not practiced before the race and takes some repetitions to adapt to. It also offers some benefits to those not racing hilly races, such as helping with cadence, strength, and speed.



In [last week's newsletter](#) I covered uphill running. This week, we'll look more closely at downhill running. Let's break down each of the four physical systems with respect to downhill running, using this 2017 [Review article](#) in *Sports Medicine* as a guide. Note: downhill running is very difficult to simulate indoors. There are treadmills that can simulate it in theory, but the psychological difference between running downhill into a floor vs on an actual hill is substantial. Take results from any studies using downhill treadmills with a healthy grain of salt.

1. Biomechanical: Downhill running is generally characterized by longer stride length and decreased stride frequency compared to level or uphill running. Foot strike pattern is usually shifted towards rear- or mid- foot strike for downhill running. Ground reaction force and impact shock are both usually higher in downhill compared to level running. As with uphill running, hip/knee/ankle joint position and movement pattern may be grade-specific.
2. Neuromuscular: Note: very few studies mentioned here. Muscle activation is grade-specific, with most differences between level and downhill running found at grades steeper than -7% and sometimes only after a time (15+ minutes) of fatigue. Quadriceps muscle activity during the eccentric (absorption) phase of landing seems to be greater during downhill compared to uphill running.
3. Musculoskeletal: The knee appears to be the most stressed joint to dissipate energy, followed by the ankle, then hip, in downhill and uphill running. This is in contrast to the hip being the most stressed in uphill running to produce power.
4. Cardiovascular: The energy cost of downhill running decreases until -20% grade at which point it increases again. The emphasis with downhill running is on energy absorption/dissipation rather than energy generation.

So, there are a number of reasons downhill running can make you faster on uphills and flats! First, when your muscles work to dissipate energy, they lengthen under load ("eccentric" contraction), which creates a lot of muscle breakdown and may make you sore the day after hill running. As the muscles repair stronger, your ability to absorb force improves and you become less sore. Since the muscles used for uphill and downhill and flat running are similar, if they become tired with downhills, your flat and uphill running will get slower. If you can train your muscles to be resilient to downhills, you will be stronger on uphills as well.

What questions do you have about training and racing? Reply to this newsletter or [email me](#), and I'll answer one next week! Also, please spread the word that I'm taking more athletes! I'm looking to work with runners and triathletes and depend on you to help spread the word :) Send them to my [website](#) to submit an inquiry.



Brownies

This is my go-to "normal" brownie recipe:

Melt 1 stick butter with 9 oz chocolate. Mix in 4 eggs. Add 2 tbsp cocoa powder, 1 cup all purpose flour, and 1 tsp baking powder. Bake for about 30 minutes in a 9x9 or 8x12 pan.

This was also the recipe I adapted to create my bean brownie recipe (linked below!). I like how the beans make the brownies a bit bigger and cut some of the sweetness but keep the amazing texture.

[Recipe](#)

Order pickup or delivery!

S.S. Endurance is done vending at the Harvard Farmers Market for 2024. Instead, I have a new pickup system! I am offering pickup **Tuesday mornings at 6:30am at Weeks Footbridge, Cambridge side** of the river. [Order online](#) by 8pm Sunday night for Tuesday pickup. Remember, I also do delivery or pickup from spots determined by you! For updates, make sure to follow me on Instagram [@coach_serena326](#). For questions, feel free to email me by responding to this email!



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