

Science of Ultra

w/ Shawn Bearden, PhD

Hi, Test First Name!

My guests this week have published some of the most comprehensive analyses of the field of running economy. My guests were Kyle Barnes, PhD and Andrew Kilding, PhD.

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Running economy is defined as the energy demand, usually oxygen consumption, at a given running speed.

Practices known to improve running economy:

*Take a personal inventory while you are running to ensure that you relaxed from head to toe.

*Running uphill, in short (12-15 seconds) bursts up steep grades, improves running economy.

*Pay attention to your arm swing, and keep it as short as is comfortable. Swinging too far reduces economy.

*Strides (running fast for 20-30 seconds) are often recommended to improve running form with the idea that this will also improve economy. There isn't evidence that they improve economy.

*Don't stretch too much because musculo-tendinous stiffness enhances energy return and therefore increases economy. However, excessive stiffness can lead to injury. So, consider training that assists with performance-based enhancements of stiffness. Training modalities that increase stiffness include:

-plyometrics

-uphill running (12-15 second steep sprints)

-weighted vest running (10-20% body mass)

-heavy squats (2-4 sets of 4 repetitions once per week, using a weight where 4 repetitions is your maximum; you couldn't do 5).

*Don't carry more than you need (food, water, gear) and wear it close to your core. Vests and waist belts tend to be more economical than handhelds. But, if you need handhelds to ensure you keep up with sufficient hydration, then they may be better for you in the long run.

*Wear the lightest shoes that work for you.

Practices known to reduce or not improve running economy:

*Do not force yourself to run with a specific cadence or stride length. Doing so reduces economy.

*Do not force yourself to have an unnatural foot strike. Whether you land fore-foot, mid-foot, or rear-foot, there doesn't appear to be a benefit to economy by changing your foot strike, and it may make you more prone to injury.

*There aren't any nutritional interventions that are established to improve economy. Caffeine, nitrites (e.g., beet root juice), green tea extract, watermelon juice, etc. have been studied but don't have compelling evidence for improving running economy in trained endurance runners.

Wrap-up

*What are training recommendations for becoming more economical (in addition to the above)?

Answers: run consistently; get plenty of uphill and downhill running; match the terrain, elevation profiles, temperatures and humidity as closely as possible to event conditions; high intensity intervals of 200-400 meters.

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All the Best,

Shawn

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