

Cashing in

Get the best out of your body by boosting your running economy, says sports scientist Garth Fox

VO₂ max – the measure of how much oxygen your body can get to your muscles – has tended to grab all the headlines when it comes to evaluating endurance running performance. After all, it's relatively straightforward to measure, gives quantifiable data and is a decent starting point for gauging an athlete's overall endurance potential.

But any event over about 3000m is too long to sustain at 100 per cent of our maximum oxygen uptake. So marathoners and 10K fans alike need to know not just how much oxygen they can take in, but how efficiently they can use it when barrelling along at race pace. This is known as your 'running economy'.

To some extent running economy is genetic, but it can be improved. Early in Paula Radcliffe's career, she was tested consistently for VO₂ max and running economy. Her VO₂ max declined by eight per cent over five years, but she improved her economy by over 10 per cent and took 46 seconds off her 3000m time. Scientists say the two most important factors are wasting less energy through vertical movement and reducing the braking forces generated when your foot lands. Varying the speed, terrain and distance will help improve your economy via these two means. The following drills will be of particular benefit.



HILL SPRINTS

This is all about maintaining good form while being as explosive as possible. Aim to sprint up a steep hill of no more than 50m for a maximum of five reps. But beware: it can be very hard on the muscles and tendon attachments of the lower leg, so take as much care over your warm-up as the drill itself.



BAREFOOT RUNNING

This is an effective means of getting the foot to land directly below your centre of mass, avoiding the lateral deceleration prevalent in heel strikers. You must start slowly – the lower leg and foot muscles will get a far harder workout than when you run in shoes. Try five minutes on soft grass or a treadmill.



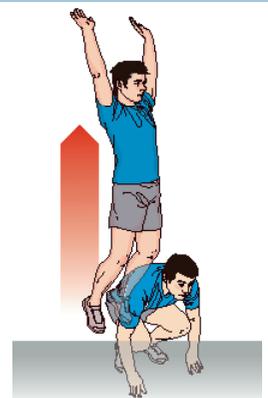
PLYOMETRIC SINGLE LEG HOPS

To improve energy storage and release, getting this exercise right takes practice, coordination and, perhaps surprisingly, a high level of core muscle activation. One leg at a time, try to string 10 hops together, focusing on minimising time between hops.



STRIDES

Minimise foot-to-ground contact time while running fast by imagining a 100m stretch of red-hot coals laid out ahead of you. Run over it fast, taking special care over your running form. Repeat several times during the early stages of a run when you are least fatigued.



PLYOMETRIC SQUAT JUMPS

These improve energy storage and release in your muscle tendon units. Standing upright with your feet hip-width apart, bend at your knees, drop down into a squat position and then immediately spring back up, jumping as high as you possibly can. Try doing 10 reps.

WORDS: GARTH FOX; IMAGE: RW IMAGES; ILLUSTRATIONS: PETER LIDIARD

▶▶▶▶▶ The most naturally economical runners on the planet are the East Africans, possibly explaining the exclusively Kenyan podium at this year's London Marathon ◀◀◀◀◀