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Review of benefits of strength training for long distance running, taken from:

Laursen et al. (2005) **Should endurance athletes supplement their training program with resistance training to improve performance.** Strength and conditioning journal. 27 (5) 50 - 55.

Should long distance runners carry out weight training routines to improve their performance ? This is an age old question which Laursen attempted to answer in a recent study. Before we look at the results and discussion, it's worth defining the term 'strength'.

Often in endurance sports we use the word 'strength' when we actually mean 'endurance'. Marathon runners often talk about the 'strength' required to get through the last 6 miles, by definition, strength is: ***'The maximal amount of force produced by a muscle or muscle group in a single contraction'***, the 1 repetition maximum is therefore a good indicator of strength. From the definition, it is clear that strength is not a vital component to get you through the last 6 miles of a marathon.

Strength training can be used to develop 'explosive power' which would help you during the last 50m of a running race, faced with a sprint finish against an opponent. Alternatively, the ability to produce a quick 'anaerobic' burst of energy would help to drive you up a short sharp hill and then recover quickly to settle back into your normal pace. These benefits are not disputed, but they are such small benefits that coaches often cannot justify the inclusion of strength training in a schedule. After all, if you are preparing for a 26 mile race, how much time can you afford to dedicate to improving your sprint finish and how much impact will it really have !!

Laursen et al (2005) set out to determine the benefits of strength training for distance runners and focused their attention on the most important issues. Forget the sprint finish, Laursen wanted to know if it would improve VO2 Max (the maximum amount of oxygen utilised by the body) and lactate threshold (the point at which anaerobic energy is used in large quantities, leading to high lactate production). These 2 measurements are the 2 most common gauges used to predict endurance performance. In addition, Laursen also noted 'running economy', which can be described as the amount of energy required to run at a constant speed.

Strength training appeared not to improve either VO2 max or lactate threshold. It should be mentioned, that it did not hinder it (some athletes fear that strength training will reduce aerobic qualities of muscle fibres). However, running economy improved. The results indicate that although maximal or near maximal parameters were not affected, the economy of movement at submaximal levels were significantly better. For marathon runners, this is an important finding. Running a good marathon time does not necessarily require a high VO2 Maximum or lactate threshold as the athlete is not working at or near their maximum for the majority of the race. For the longer distance athlete, running economy and energy conservation are most important.

Why did strength training improve economy ?

You need energy to move your limbs and stabilise your torso whilst you run. If everything is flapping about, you waste a high amount of energy trying to hold things in the correct position. 'Core strength & stability' improves your running economy by holding the skeleton firm, allowing you to concentrate your efforts and energy towards making your legs go faster. In conclusion, if you are running long distance events, a core strengthening programme is something worth considering.

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