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Review of effects of high intensity resistance training upon running performance, taken from:

Hamilton et al (2006) **Effect of High Intensity Resistance Training on Performance of Competitive Distance Runners**. Int Journal of Sports Physiology and Performance. 1: 40-49

The subject of resistance training to improve endurance performance has been hotly debated for some time. Various studies completed in recent years have produced conflicting and somewhat confusing results, which have failed to clarify anything, but which have continued to fuel discussion.

In a recently published study, Hamilton et al (2006) set out to determine if high intensity resistance training could improve running performance in trained distance runners. The experiment involved 20 trained distance runners who were split into a 'resistance training' group or a 'control' group for comparison.

Before the experiment started, all runners completed a 5k time trial on an outdoor circuit. The route was undulating, woodland tracks, well known to all of the runners. The fact that the time trial took place outdoors is of great significance as it directly assesses performance in a realistic environment. As competitive triathletes, you need to know that you will run faster on the road or trail, as opposed to the laboratory.

The 'resistance training' group replaced part of their normal training with a high intensity resistance workout which lasted 30 minutes in total, including warm up and cool down. The high intensity resistance component consisted of the following:

**3 X 20 repetitions of maximal single leg jumps (Stepping onto a 40cm box, 20 maximal single leg jumps were performed with the right leg over a 2 minute period. This was then repeated for the left leg to complete 1 set).**

**3 sets of maximal treadmill running (1 set consisted 5X30 seconds with 30 seconds recovery, treadmill set at 5% incline)**

The single leg jump sets and maximal treadmill running sets were alternated, athletes completed 1 set of single leg jumps for each leg, then 1 set of treadmill sprints with a 2 minute transition period between each.

### Results

The resistance training produced significant improvements in running performance. Following only 10 sessions (2-3 per week) predicted 1500m running speed increased by an average of 4.1%, running speed at anaerobic threshold (4mmol) increased by an average of 4% and 5km time trial speed increased by an average of 2.2% (a saving of approximately 20 seconds).

### Discussion

A key factor to note is that no more improvements were noted following 10 sessions, signifying that physiological adaptations did not continue after that time. Introducing such training into your schedule should therefore be carried out in a periodised manner and should take place within the competitive phase. Select an event you would like to target and begin your resistance training 5 weeks prior. It should also be noted that Hamilton has completed a similar study with cyclists and found the benefits to be even greater.

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