

Energy in versus energy out – the key to optimising body composition for endurance athletes?

Running and triathlon are among the most popular and fastest growing sports in the world. In these sports, time of is of the essence and strategies to reduce time taken to complete a set distance are most welcome. It is commonly assumed that lighter is faster although in more recent times recreational athletes are becoming aware that optimising body composition i.e. reducing fat and maintaining muscle may be more important for their athletic endeavours.



Fig. 1. Body composition assessment using Dual X-Ray Absorptiometry.

This awareness has resulted from scientific progress and greater access to information since the advent of the internet and particularly social media over the past 10 years. This can be a double edged sword, there is evidence to support the use of long slow distance training over weight

training for greater fat loss and conversely, there is evidence to support the opposite. Recently, high intensity interval training has been proposed an effective strategy to reduce fat mass, particularly in the fasted state. Much of the confusion originates from interpretation of the scientific literature and a lack of context as to where findings are derived from. What has been consistently demonstrated in the scientific literature is that a consistent period whereby energy intake is less than energy output is required to reduce fat mass. There are different ways of achieving this but a combination of exercise and dietary restriction is thought to be most effective for long term body composition changes. Case reports provide an opportunity to test a scientific theory on an individual in a real life scenario with appropriate context for the reader. We recently published a paper based on a competitive amateur athlete (in full time employment but willing to train >5 times per week).

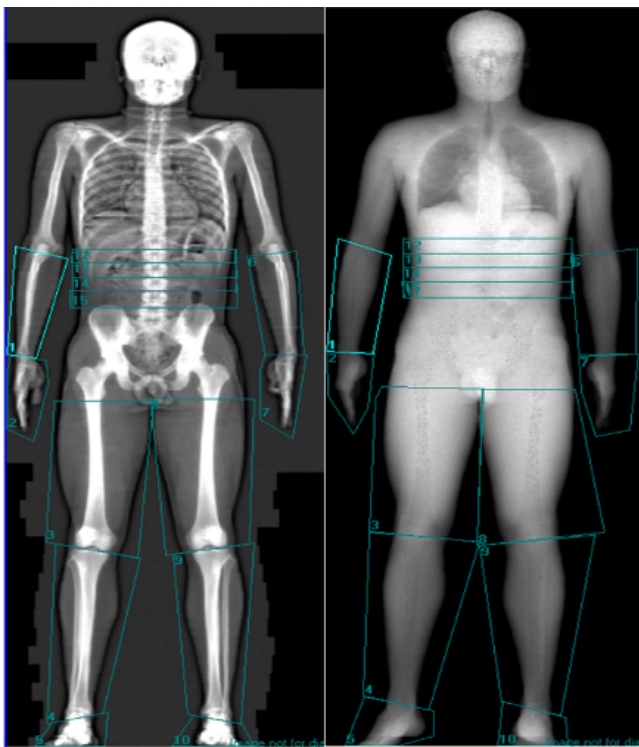


Fig. 2. Body composition assessment using Dual X-Ray Absorptiometry.

Our paper focuses on two time points whereby this athlete's body composition was measured before and after two different interventions using imaging technology (DXA). At time point 1 the athlete is aged 23 years and experiences a 5.1kg fat loss and 5.1kg increase in muscle mass as a result of 16 weeks of moderate intensity running combined with once weekly circuit training. At time point 2 the athlete is aged 28 years and experiences a 5.3kg fat loss and a 0.8kg increase in muscle mass as a result of 12 weeks of a predominately (75%) non-weight bearing (cycling, swimming, rowing) intervention. Specific dietary restriction was not undertaken during either

intervention, rather the athlete consumed their normal balanced diet keeping 'treat foods' for the weekend.

There were a couple of interesting observations for our team from this case report. The first was that a 5kg increase in muscle mass was possible from a running intervention with only one weekly resistance training session. Traditionally, we would assume a period of intensive weight training would be required to see such gains. The second observation was that a similar fat mass loss could be made from a non-weight bearing intervention of similar duration, although requiring greater hours spent training. Linked to this and despite the non-weight bearing nature of the intervention it was also interesting to note that muscle mass could be maintained or even increased slightly. In summary, the thing which was common to both interventions was a consistent period of training and as such, this case reports supports the notion that energy deficit regardless of how it is achieved is required for fat loss.

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Publication

[Body composition changes in an endurance athlete using two different training strategies.](#)

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