

Exercise on its own is not enough.

Without feeding muscles before and after exercise, its benefits cannot be fully optimised.

By Aaron Fanning.



Introduction

Regular exercise is an essential element for a healthy body and mind. Current guidelines around the world* highlight the beneficial effects of exercise for a range of leading diseases such as cardiovascular disease, type-2 diabetes, and metabolic syndrome. This is especially important with ageing, where exercise can help reduce the muscle loss that occurs with ageing (Shad et al, 2016).

*(Office of Disease Prevention and Health Promotion, 2008; Department of Health, 2011; Canadian Society for Exercise Physiology, 2012; Department of Health, 2008)

BUT WITHOUT FEEDING THE MUSCLES BEFORE AND AFTER EXERCISE, THE BENEFITS OF EXERCISE CANNOT BE FULLY OPTIMISED

Athletes have long known that in order to reap the maximum benefits from time spent performing exercise, it is important to provide quality nutrition. It is well known that a high carbohydrate diet helps improve performance across a wide range of sports (Burke, 2000). However, dietary protein is another nutrient of importance to help promote muscle recovery from exercise.

Muscle is made up of a range of proteins, especially the two major proteins – actin and myosin; in fact they are two of the top four proteins expressed in the body (Jackson, 1998). Exercise can stimulate the production of muscle proteins for up to 48 hours after exercise. But if you don't eat, the body will break down more muscle protein than it produces (Biolo et al, 1995), and the body does not grow and adapt. By consuming food – especially protein – after exercise, protein breakdown is minimised and protein synthesis is stimulated, so you end up with a positive protein balance in the body (Biolo et al, 1997). The effects of dietary protein and exercise are synergistic, activating an anabolic pathway within the muscle. Protein stimulates this pathway and also provides the amino acid substrate for the muscle to build the new proteins.



By consuming protein after resistance exercise, there is a greater gain in muscle mass and strength, than when consuming other nutrient sources (Cermak et al, 2012), in both young and old subjects. Most research has focussed on the benefits of protein for resistance exercise; sound reasoning (Moore et al, 2014) exists for the beneficial impact of protein on endurance exercise.



CONSUMING THE RIGHT AMOUNT OF PROTEIN

This knowledge is reflected in the current protein recommendations for athletes, which are at least 1.3-2.0g of protein per kilogram bodyweight per day (Phillips and van Loon, 2011), roughly 60-200% higher than the recommendation for the general population. It's not just about the absolute amount of protein, it's also how we consume protein during the day; a combination of the amount of protein and the number of times that we can provide these adequate amounts of protein to stimulate the muscles.

The amount of protein in a single dose to stimulate muscle protein synthesis appears to be around 20g of protein for younger adults; and as much as 40g of protein for older adults (Churchward-Venne, 2016). The pattern of consumption across the day has also become an interesting research area. Initially hypothesised to help maintain muscle mass in older adults (Paddon-Jones and Rasmussen, 2009), it has also been examined in athletes, where four adequate doses of protein across the day resulted in a greater increase in muscle protein synthesis (Areta et al, 2013) than smaller doses consumed more often, or larger doses consumed less often.

Conclusion

Dairy protein fuels performance and feeds recovery. The type of protein consumed can also influence the body's response to protein. Dairy protein is an excellent source of high quality protein to support the growth and maintenance of muscle.



It contains high levels of the essential amino acids required by the body, and can also stimulate muscle protein synthesis to a greater extent than plant proteins, such as soy (Wilkinson et al, 2007; Yang et al, 2012; Tang et al, 2009). When dairy protein is combined with resistance exercise, it leads to greater gains in muscle mass (Hartman et al, 2007; Volek et al, 2013).



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