Exercise is essential for a healthy body.

Healthy muscle is essential to maintaining mobility and health throughout the human lifespan. Yet muscle remains an underappreciated tissue (Wolfe, 2006). While healthy young adults have approximately 40% of their bodyweight as muscle (Janssen et al, 2000), this level substantially decreases over their lifespan. Lack of physical activity, especially in ageing adults, is a key risk factor for loss of muscle mass (Bell et al, 2016) and governmental recommendations for highlighting the need for approximately 30mins per day of moderate to vigorous physical activity may help reduce risk of a variety of diseases (Thorton et al, 2016), as well as help attenuate muscle loss.

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

For decades athletes have known that in order to reap the maximum benefits from time spent performing physical activity, it is important to provide quality nutrition. Protein is an essential nutrient, especially when it comes to muscle mass because muscle, after accounting for water, is largely protein. In fact, the two primary proteins in muscle that are involved in muscle contraction – actin and myosin – are among the top four proteins expressed in the body (Jackson, 1998).

Exercise aids in the maintenance and growth of these proteins by stimulating the synthesis of new proteins for up to 48 hours after a resistance exercise bout (Phillips et al, 1997). Without food, this stimulus does not lead to increases in muscle because the balance between muscle synthesis and muscle breakdown still remains negative (Biolo et al, 1995). However, when food, especially protein, is provided, the net balance is positive (Biolo et al, 1997), muscle growth occurs, and the effects of exercise and nutrition become synergistic with each other. This process occurs via a protein sensitive metabolic pathway, where the amino acids from the protein provide both the substrate to build new proteins, but also the anabolic signal within the body to stimulate muscle protein synthesis (Groen et al, 2015). When protein is consumed along with a resistance training exercise program, the gain in muscle mass and strength is greater than when consuming an equivalent amount of energy from other sources (Cermak et al, 2012).

The absolute amount of protein consumed also plays a role. General recommendations for protein are around 0.8g of protein per kilogram body weight; however, this is a minimum recommendation – the level required to optimise health into older age and help maintain muscle mass may be greater than this, with recent recommendations 1.0 – 1.2g of protein per kilogram body weight (Bauer et al, 2013; Deutz et al, 2014). Those performing higher levels of physical activity may need around 1.3 – 1.8g per kilogram body weight, up to twice the general recommended minimum (van Loon and Phillips, 2011). These levels are similar to those seen as protective of muscle mass in larger observational studies (Houston et al, 2008), and protective against frailty in older adults (Rahi et al, 2016).

Another factor that has become of interest is the balance of protein across the day (Paddon-Jones and Rassmussen, 2009). It is common in the western world to consume most protein in the evening meals, creating a period during the day where there is not a positive protein balance. Over time, this can potentially lead to muscle loss and increasing risk of frailty (Bollwein et al, 2016).
While more work is required to confirm this relationship, observational data provides some additional support to this hypothesis (Farsijani et al, 2015; Loenneke et al, 2016). Experimental data, especially with resistance exercise, also supports a benefit to increasing protein earlier in the day in order to encourage a greater increase in muscle protein synthesis (Mamerow et al, 2014).

**Dairy protein fuels performance and feeds recovery.**

Dairy protein offers an excellent source of protein to support the growth and maintenance of muscle. It has high levels of essential amino acids, and can stimulate muscle protein synthesis to a greater extent than soy proteins. When combined with resistance exercise, this can lead to greater gains in muscle mass.
References


