PROTEIN IS ESSENTIAL FOR LEAN MUSCLE GROWTH AND REPAIR
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20% of muscle is protein. Consuming the required quantity of protein is crucial for rebuilding and toning muscle after exercise. To meet the minimum amino acid requirements for body tissue repair, healthy adults should consume at least 0.8g of protein per kg of body weight every day.

In his latest White Paper about the benefits of dairy protein, Fonterra Senior Nutritionist, Aaron Fanning takes a look at the need for high quality protein to maintain, grow and repair muscle which is necessary for maintaining health throughout every stage of life.

"Protein is a key nutrient for muscle mass because muscle is largely comprised of a range of proteins ... the protective effect of protein is thought to be driven by a complex interaction of dietary protein providing amino acids as a substrate to build and maintain new muscle" says Aaron.

"Dairy protein is an excellent source of high quality protein and is an excellent source to help support the growth and maintenance of muscle. It contains high levels of the essential amino acids required by the body, and it is also able to stimulate muscle protein synthesis to a greater extent than plant proteins, such as soy" he adds.

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Over 20% of muscle is protein. Many of us don’t give a second thought to muscle, believing it to be the domain of elite athletes interested in peak physical performance. However adequate muscle is essential for everyday activity, and helps maintain health throughout life. (Deer and Volpi, 2015).

Like bone, muscle mass unfortunately declines during later life in a process called sarcopenia. Muscle makes up 30-40% of bodyweight in a healthy young person (Janssen et al., 2000) but from middle age this declines by 0.4 – 2.6% per year (Mitchell et al., 2012), increasing the risk of frailty, disability and physical dependence in older adults (Deer and Volpi, 2015).

Protein is a key nutrient for muscle mass. This is because muscle is largely comprised of a range of proteins, from myosin and actin which are the major proteins that allow for muscle contraction, to other proteins which allow for normal muscle metabolism.

Muscle is an adaptive tissue which can regenerate and respond to changes in its environment (Goldspink, 1998) by the constant turnover of the tissue that it is built from. This muscle protein turnover is driven by two dominant forces - muscle protein breakdown, where old tissue is broken down, and muscle protein synthesis, where new tissue is created. To support this turnover, our diet needs to provide the protein building blocks for the body to create new muscle.

Healthy adults should consume at least 0.8g of protein per kilogram of bodyweight every day to meet the minimum amino acid requirements for body tissue repair.

A number of factors determine how much protein is required. Global dietary protein recommendations are defined as the lowest level of dietary protein intake that will balance the losses of nitrogen from the body, and thus maintain the body protein mass, in persons at energy balance with modest levels of physical
activity (WHO/FAO/UNU, 2007). Typically this level is approximately 0.8g of protein per kilogram bodyweight (Institute of Medicine, 2002; Commonwealth Department of Health and Ageing Australia, 2006; EFSA, 2012). This recommendation would be around 68g and 54g per day for an 85kg man and 67kg woman, respectively.

It is important to note that this level of protein is not developed to be the optimal intake of protein to maintain health (WHO/FAO/UNU, 2007). In fact some countries provide acceptable distribution ranges for protein where this minimum recommendation is at the bottom end of the recommended distribution (Institute of Medicine) or even below the bottom end (Commonwealth Department of Health and Ageing Australia, 2006). While these ranges of protein, carbohydrate and fat intakes are required, recommended minimums do not take into account the role played by other nutrients (Wolfe and Miller, 2008). Current acceptable ranges for dietary protein fall between 10-35% (Institute of Medicine) and 15-25% (Commonwealth Department of Health and Ageing Australia, 2006) of energy intake.

Intakes of protein higher than the minimum recommendations are protective of muscle with ageing, where 1.2g per kilogram of bodyweight attenuated losses (Houston et al., 2008). These data also match recent guidance from medical and research groups which recommend 1-1.2g of protein per kilogram of bodyweight per day for older adults (Bauer et al., 2013; Deutz et al., 2014).

The protective effect of protein is thought to be driven by a complex interaction of dietary protein providing amino acids as a substrate to build and maintain new muscle. By delivering these amino acids, it also provides a key anabolic signal to the muscle to synthesise new muscle (Groen et al., 2015).

Consuming the required quantity of protein is crucial for rebuilding and toning muscle after exercise. The type of protein eaten can also impact the muscles’ response. Dairy protein is an excellent source of high quality protein (Rutherfurd et al., 2015) and is an excellent source to help support the growth and maintenance of muscle. It contains high levels of the essential amino acids required by the body, and it is also able to 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 this protein source is combined with resistance exercise, it leads to greater gains in muscle mass (Hartman et al., 2007; Volek et al., 2013). This reinforces the requirement for high quality proteins in our diet and consolidates the view that protein from dairy sources is an excellent product to meet protein and essential amino acid requirements, especially for those interested in exercise, healthy lifestyles, and ageing well.

Fonterra offers the largest range of dairy protein ingredients in the industry. Our NZMP range of SureProteinTM dairy solutions helps food and beverage manufactures to increase the protein content in their products and ensure their consumers get the quality protein they need to support healthy lifestyles. Our SureProteinTM MPC 4882 is a unique functional milk protein ingredient that is ideal for delivering high levels of protein into nutritional applications, including sports and medical beverages as well as bars and nutrition supplements. Its versatility and high nutritional value makes it a great solution for delivering active consumers with the protein required for muscle growth and repair in the formats they enjoy.
References


