Healthy ageing:

Stay stronger for longer

solmiko
ADVANCED MILK PROTEINS

Glanbia Ireland
Goodness Grows Here

Glanbia Ireland is an ingredient solutions partner to some of the world's leading companies and brands. At the forefront of ingredient technology, we offer a range of solutions to match the ever-changing demands of the food and nutrition industry and its consumers. With quality dairy and grains sourced from 5,000 Irish family farms, combined with advanced market research and insights, our unique platform offers fully traceable and sustainably produced natural solutions to help our customers stay ahead of the curve.

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GOODNESS GROWS HERE

Muscle and bone health are key to strength

As people age they experience a natural decline in skeletal muscle mass, muscle function and bone strength. By exercising regularly and including sufficient protein into the diet, people can slow muscle loss and maintain bone strength.

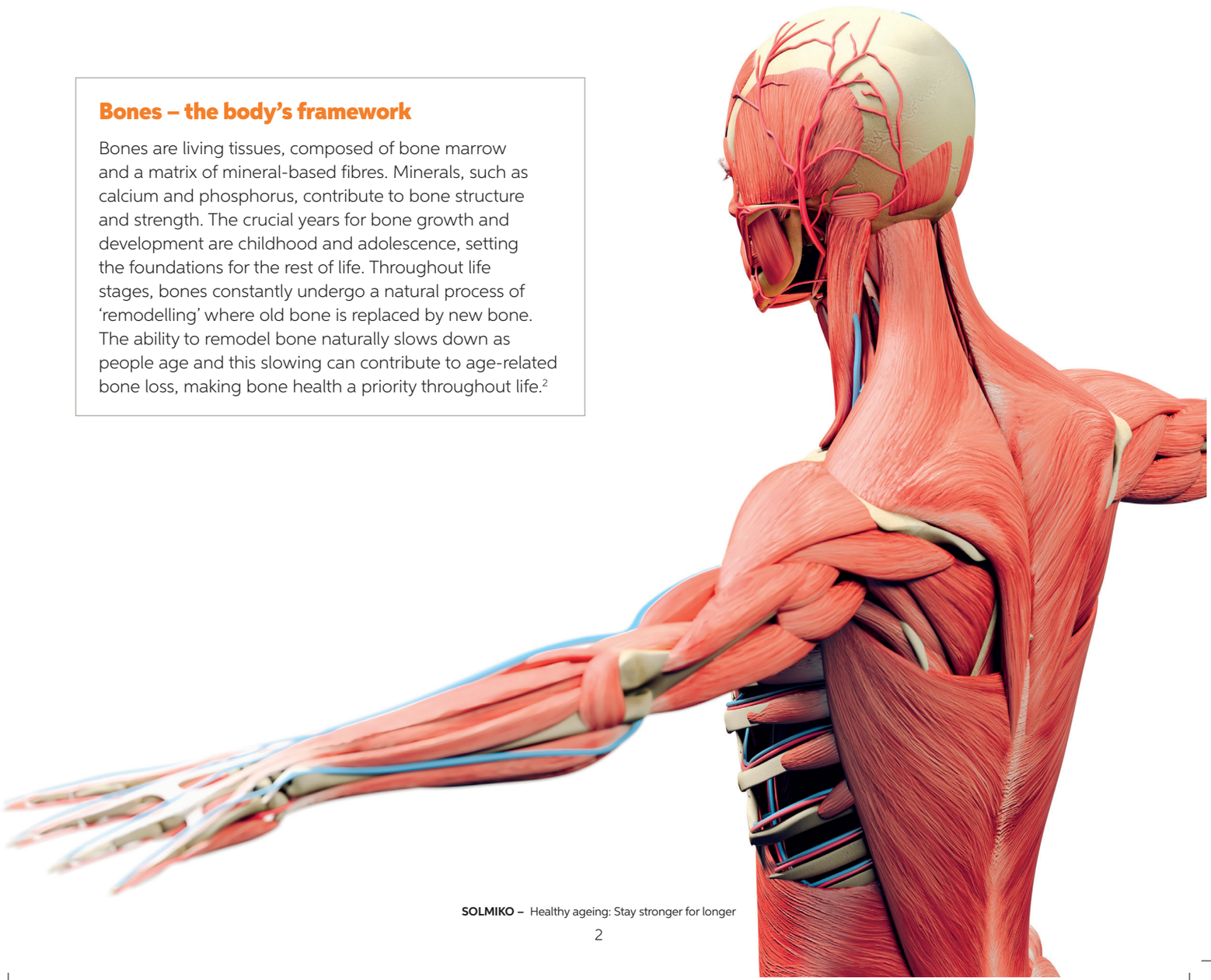
The musculoskeletal system is the supporting framework to the body and provides stability, structure, movement and agility. The musculoskeletal system is composed of muscles, bones, tendons, ligaments, cartilage, joints and other connective tissue.[1]

Bones provide stability and support while muscles provide strength and movement.

Musculoskeletal health becomes more important as people age as muscle loss and bone strength can decline naturally. A strong musculoskeletal system can help prevent injury, frailty and aid recovery from surgery. This is not just true of older people but is significant throughout all life stages. [1]

Bones – the body's framework

Bones are living tissues, composed of bone marrow and a matrix of mineral-based fibres. Minerals, such as calcium and phosphorus, contribute to bone structure and strength. The crucial years for bone growth and development are childhood and adolescence, setting the foundations for the rest of life. Throughout life stages, bones constantly undergo a natural process of 'remodelling' where old bone is replaced by new bone. The ability to remodel bone naturally slows down as people age and this slowing can contribute to age-related bone loss, making bone health a priority throughout life.[2]



Muscles – the power within

Muscles are often seen as the instrument of the fit and athletic. However, muscles are required to perform every day, mundane activities such as housework, grocery shopping or climbing the stairs. Therefore, keeping muscles healthy is not just a task for athletes, it is important for all people.
A focus on building and maintaining muscle throughout life can help people to stay strong, active and independent, particularly as they age. As well as being essential for movement, supporting the skeleton and posture, muscles also play a vital role in the metabolism. Having an adequate muscle mass can also help to improve disease outcomes.[3]

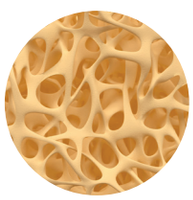
Common factors affecting the musculoskeletal system.

As people age their body's ability to adapt to the stresses and strains of everyday activities can affect people to varying degrees. Lifestyle factors such as inactivity, smoking, alcohol and poor diet as well as birth defects and some medications can make people more susceptible to certain musculoskeletal conditions.[4]

Osteoporosis:

Osteoporosis is a disease resulting from the loss of bone tissue. As bones become porous or less dense, they weaken, which increases the risk of broken bones (fractures) even following a minor fall or bump. The most common site for these fractures to occur is the wrist, upper arm, pelvis, hip or spine. The fractures can lead to severe pain, significant disability, loss of mobility, independence and even death. Although older females are most at risk, osteoporosis can affect both genders and all ages. Though osteoporosis is common it is also preventable and there are a number of steps which can be taken to avoid its onset, such as exercise, healthy balanced diet with adequate nutrients for bone and muscle health and maintaining healthy lifestyle habits.[5]

NORMAL BONE



OSTEOPOROSIS BONE

Sarcopenia:

Sarcopenia describes a progressive decline in muscle mass and strength, which can lead to frailty and loss of function. Muscle mass and strength may vary across a lifetime usually increasing through growth in youth and early adulthood and decreasing with old age. In general, after the age of 50, muscle mass naturally declines by about 1% per year, particularly if people are inactive. These small losses can go mostly unnoticed, but over time they can accumulate to around 30% muscle loss by the age of 80. Sarcopenia can lead to a loss of independence as it increases the risk of falls and fractures. It is also associated with poorer disease outcomes. Maintaining muscle mass as people age is important in the prevention of sarcopenia. Inactivity resulting can lead to loss of mobility, and therefore an increased risk of sarcopenia.[6]

Maintaining a healthy musculoskeletal system

Muskuloskeletal health and strength is determined in a significant way by factors that cannot be controlled, such as genetics, gender and age. However, there are also factors that can be controlled to ensure a healthy musculoskeletal system. These include, diet, physical activity and lifestyle habits. Key practices to maintain a healthy musculoskeletal system are:

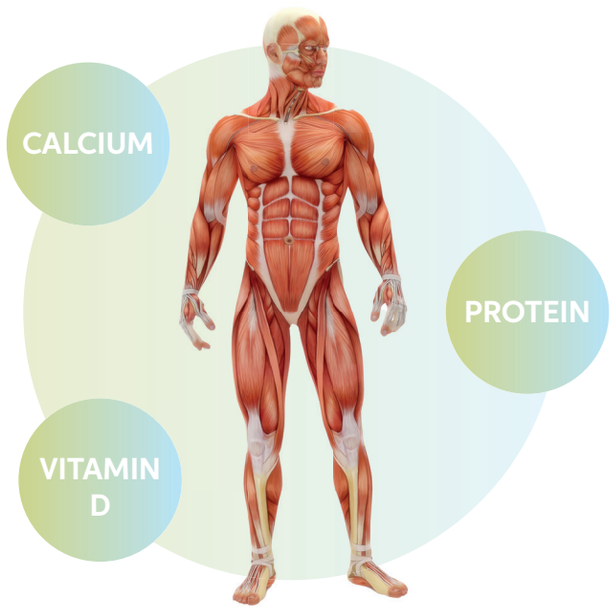
Stay strong and supple:
Resistance style exercises are important for healthy bones and muscles. Stretching exercises can be beneficial for posture and supple joints. Stronger core muscles improves balance and can help prevent falls.[1]

Maintain a healthy body weight:
Being either underweight or overweight can have a negative impact on musculoskeletal health. Being very thin or losing weight very quickly can result in low muscle mass. Being overweight can increase pressure on joints such as knees, hips and back, thus increasing the risk of pain and injury.

Ensure a diet rich in nutrients:
A balanced diet which provides adequate nutrients, including calcium, protein, phosphorus, magnesium, potassium, manganese, vitamin K, zinc, vitamin C and vitamin D are essential for musculoskeletal health.

Adequate nutrients are important for bone and muscle health

Following a healthy balanced diet, containing adequate calories is an important measure to prevent the onset of osteoporosis and sarcopenia. The most important nutrients for bone and muscle health are calcium, phosphorus, vitamin D and protein.[7]



Calcium

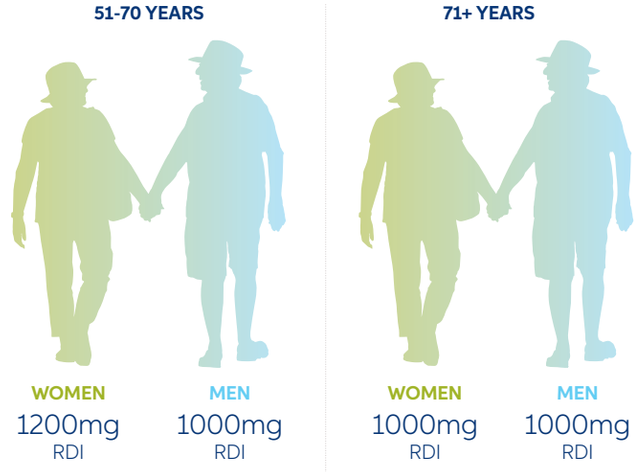
Approximately 99% of the body's calcium levels can be found in the bones and teeth. 30-35% of bone mass and much of its strength comes from calcium. Bone also acts as a reservoir for maintaining calcium levels in the blood, this is crucial for nerve and muscle function. Like a number of bodily functions, the body's ability to absorb calcium also decreases with age, which is one of the reasons why older adults have higher calcium requirements.

Calcium recommendations vary from country to country but all recognise that older people and post menopausal women require higher levels. The best sources of calcium are from dairy foods as they are the most bio-available.

Phosphorus

Phosphorus contributes to the maintenance of normal bones.

The most widely used recommendation for calcium intake is from the Institute of Medicine[8]



Vitamin D

Vitamin D is a key nutrient for bone and muscle health and plays 3 crucial roles:

1. Assisting the body to absorb calcium from food and regulate its levels in the blood
2. Ensuring the correct renewal and mineralisation of bone
3. Helping to improve muscle function, which in turn helps to reduce the risk of falls

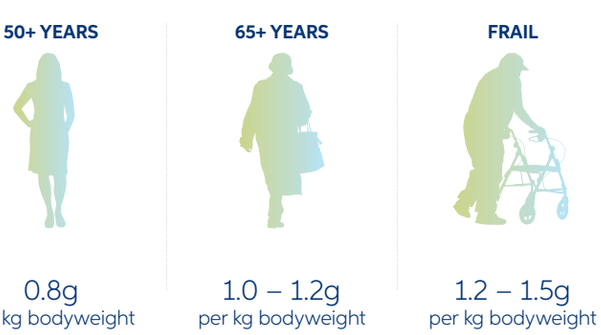
Protein quality, quantity and timing are important to consider

Proteins are fundamental structural and functional elements within every cell of the body and are involved in numerous metabolic interactions. Protein is especially important for muscle maintenance and recovery.

Quantity:

The traditional recommendation for protein intake is 0.8g/kg for adults of all ages. Due to the balance between muscle protein synthesis and breakdown in the maintenance of muscle mass there is now a growing acknowledgement for the importance of increased protein intake amongst older people. In 2013, an expert consensus group, PROT-AGE, advised an intake 1.0-1.5 g/kg/day for individuals older than 65 years[11]. These recommendations have been incorporated into the European Society for Clinical Nutrition and Metabolism (ESPEN) guidelines on "Protein intake and exercise for optimal muscle function with aging", published the following year.[8]

Protein requirements for older adults for optimal protein synthesis.[9]



Quality:

Essential amino acids are the building blocks of protein and leucine is the most important essential amino acid and nutritional stimulus for muscle protein synthesis.

The main determinate for nutritional quality of protein is the amount of essential amino acids (EAAs) present in a dietary protein and the digestibility of these. Protein Digestibility Corrected Amino Acid Score (PDCAAS) is a widely used assay for evaluating protein quality. EAAs cannot be synthesised by the body and therefore, need to be consumed through the diet.

Dairy protein is considered a "complete" protein source containing all the essential amino acids vital for human health. Dairy protein receives a PDCAAS of 100.

solmiko ADVANCED MILK PROTEINS

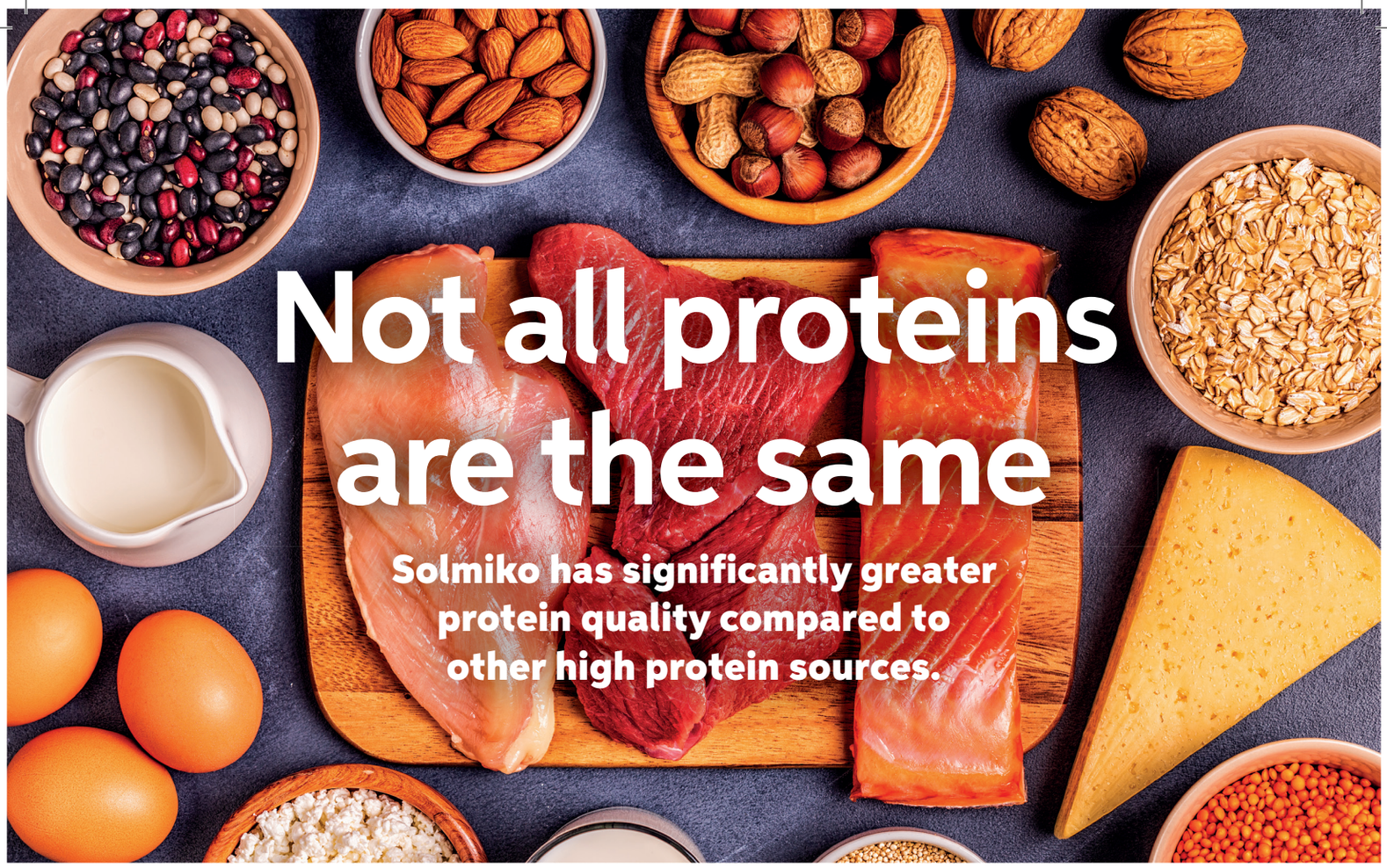
Solmiko contains both casein and whey protein in the natural ratio as found in milk (80:20).

Solmiko is naturally rich in all nine Essential Amino Acids including:

Leucine is one of the key drivers of muscle protein synthesis. Leucine acts like a molecular switch that turns on the manufacturing of muscle in the body.[10, 11]

Valine stimulates muscle growth and regeneration and is involved in energy production.

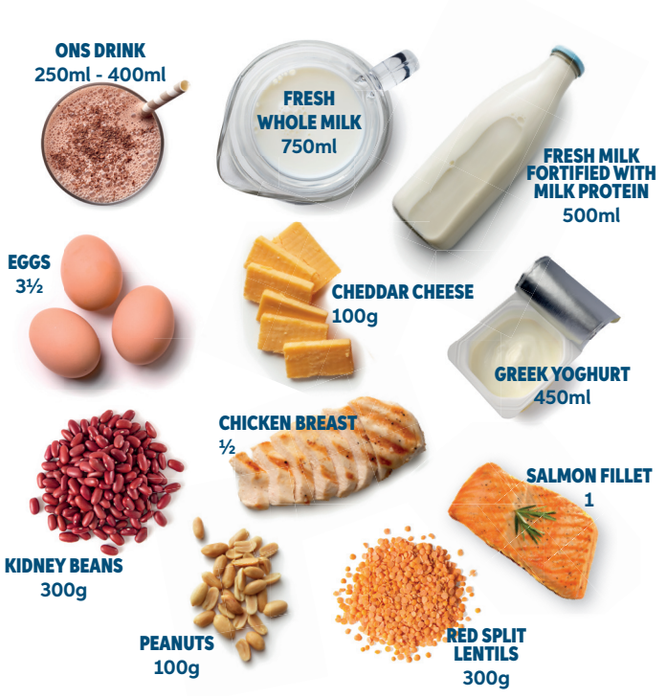
Isoleucine is involved in muscle metabolism. It is also important for immune function, haemoglobin production and energy regulation.[12]



Not all proteins are the same

Solmiko has significantly greater protein quality compared to other high protein sources.

To provide an average 25g portion of protein a person would need to consume the following amounts of some common foods.

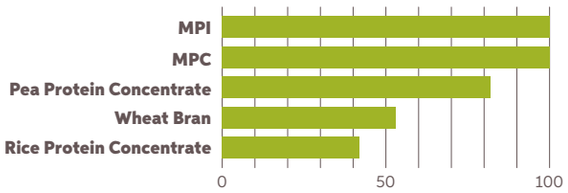


A 29g portion of SolmikoHD MPC and a 30g portion of SolmikoHD MPI will provide 25g of protein.

solmiko ADVANCED MILK PROTEINS HD MPC 29g

solmiko ADVANCED MILK PROTEINS HD MPI 30g

Protein Digestibility Corrected Amino Acid Score (PDCAAS) values for different protein sources[13]



Timing:

Protein intakes should be spread across the day to ensure the constant supply needed for optimal muscle protein synthesis.[13] It is recommended to consume 20-30g of protein at each meal depending on age. For younger adults 20g of protein per meal is recommended however as people age the requirement increases.[15]

Protein requirements per meal according to age

50+ YEARS	65+ YEARS	FRAIL
15 – 20g per meal (3 meals)	25 – 30g per meal (3 meals)	1.2 – 1.5g per meal (3 meals)

In addition to Solmiko's high protein content, it also contains both casein and whey protein in the same ratio present in cow's milk, 80:20 casein to whey. Both whey and casein provide all the essential amino acids for muscle synthesis. However, the major difference is the digestibility rate. Whey is a fast acting protein transferring to the small intestine rapidly, while casein is a slow-acting protein and is retained in the stomach. Therefore, casein stimulates muscle synthesis over a longer period compared to whey protein. Casein provides more satiating effects as the body slowly digests casein, potentially curbing appetite.[15]

A range of advanced, high quality proteins naturally rich in essential amino acids.

Solmiko is manufactured from fresh, filtered skimmed milk, it is an excellent source of native micellar casein and whey proteins in the same ratio as found naturally in milk (80/20).

The Complete Range: Glanbia Ingredients Ireland now offers 8 types of advanced milk protein ranging from MPC to MPI, our HD portfolio is outlined below.

	Solmiko HD MPC	Solmiko HD MPC LL	Solmiko HD MPI	Solmiko HD MPI LL
Protein	80% min	80% min	85% min	85% min
Calcium	2200mg	2250mg	2200mg	2180mg
Fat	2% max	2% max	2% max	2% max
Lactose	**6%**	**4%**	**2%**	**0.5%**

Note: These are typical nutritional values based on average nutrition information and are subject to change due to seasonality.

Benefits

- ✓ High in Protein
- ✓ High quality Protein
- ✓ From grass fed cows
- ✓ Low in Sugar
- ✓ Low Fat
- ✓ Superior heat stability
- ✓ Higher bulk density
- ✓ Enhanced solubility
- ✓ Vegetarian, halal and kosher
- ✓ Clean, fresh dairy taste

Solmiko is suitable for a variety of applications

RTM powdered nutritional products

RTD beverages including meal replacement & pH neutral sports drinks

Protein fortified foods

Weight management products

Medical & clinical nutrition applications

Child nutrition such as follow-on formula and growing up milks

Our Unique Dairy System

Grass Fed Cows
Outdoor grazing on nutritious grass for most of the year

Cleanest Air in Europe
Urban outdoor air pollution index

Island Location
On the edge of the Atlantic Ocean with plentiful rain

Product Quality
Multiple checkpoints from farm to factory

Food Authenticity
Produced honestly by safe family farms

Clean Label
Non-GMO, hormone-free, Kosher & Halal

Cow & Milk Traceability
From grassland to customer

Trusted Partner
Supporting leading global brands

Our R&D Function

The innovation hub
Our Innovation Hub houses world class facilities enabling us to bring our concepts to life.

Leading the way in process and technology
Functionalising and developing ingredients whilst always maintaining nutritional integrity.

Our external ecosystem
Our extensive network of external partners ensures we are agile.

Developed by our experts
Our team of experts passionately researching the worlds of dairy and plant.

Providing superior nutrition
At Glanbia Ireland the foundations of nutrition are built on dairy and plant. Our ethos: "Good for You, Good for the Planet" .

References

1. 2017. Bone, Muscle & Joint Health Nutrition & Orthopaedic Surgery. 1st ed. [ebook] Dublin: ndc.ie. Available at: https://ndc.ie/publications/.
2. Geiker et al (2020) Osteoporosis International 31: 601 - 615
3. Mak TN & Caldeira S. The Role of Nutrition in Active and Healthy Ageing. For prevention and treatment of age-related diseases: evidence so far. European Commission JRC Science and Policy Reports. (2014) Available at https://ec.europa. eu/jrc/sites/default/files/lbna26666enn.pdf
4. Http://www.worldosteoporosisday.org/
5. https://www.irishosteoporosis.ie/about-osteoporosis/
6. Sarcopenia: revised European consensus on definition and diagnosis Cruz-Jentoft et al. Age Aging 2010/2018
7. https://ndc.ie/wp-content/uploads/2020/03/Website-version-Brochure-Dairy-and-Cholesterol_v5.pdf
8. Food and Nutrition Board, Institute of Medicine, National Academy of Sciences, 2010
9. Deutz NE, Bauer JM, Barazzoni R, Biolo G, Boirie Y, Bosy-Westphal A, Cederholm T, Cruz-Jentoft A, Krznariç Z, Nair KS, Singer P, Teta D, Tipton K, Calder PC. Protein intake and exercise for optimal muscle function with aging: recommendations from the ESPEN Expert Group. Clin Nutr. 2014 Dec;33(6):929-36.
10. Donald K Layman, Tracy G Anthony, Blake B Rasmussen, Sean H Adams, Christopher J Lynch, Grant D Brinkworth, Teresa A Davis, Defining meal requirements for protein to optimize metabolic roles of amino acids, The American Journal of Clinical Nutrition, Volume 101, Issue 6, June 2015, Pages 1330S–1338S
11. Phillips, S.M., 2016. The impact of protein quality on the promotion of resistance exercise induced changes in muscle mass. Nutrition & metabolism, 13(1), p.64
12. McCance, R. A., & Widdowson, E. M. (2015). McCance and Widdowson's the composition of foods.
13. Rutherfurd, S. M., A. C.Fanning, B. J.Miller, and P. J.Moughan. 2015. Protein digestibilitycorrected amino acid scores and digestible indispensable amino acid scores differentially describe protein quality in growing male rats. J. Nutr. 145:372–379
14. Lanham-New, Susan A., Ian A. MacDonald, and Helen M. Roche, eds. Nutrition and metabolism. Vol. 5. John Wiley & Sons, 2011.
15. Delley M & Brunner T (2019) 'Breakfast eating patterns and drivers of a healthy breakfast composition' Appetite 137; 90-98
16. Berrazaga I, Micard V, Gueugneau M, Walrand S (2019) 'The Role of the Anabolic Properties of Plant- versus Animal-Based Protein Sources in Supporting Muscle Mass Maintenance: A Critical Review' Nutrients 11(8); 1825

Get in Touch

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