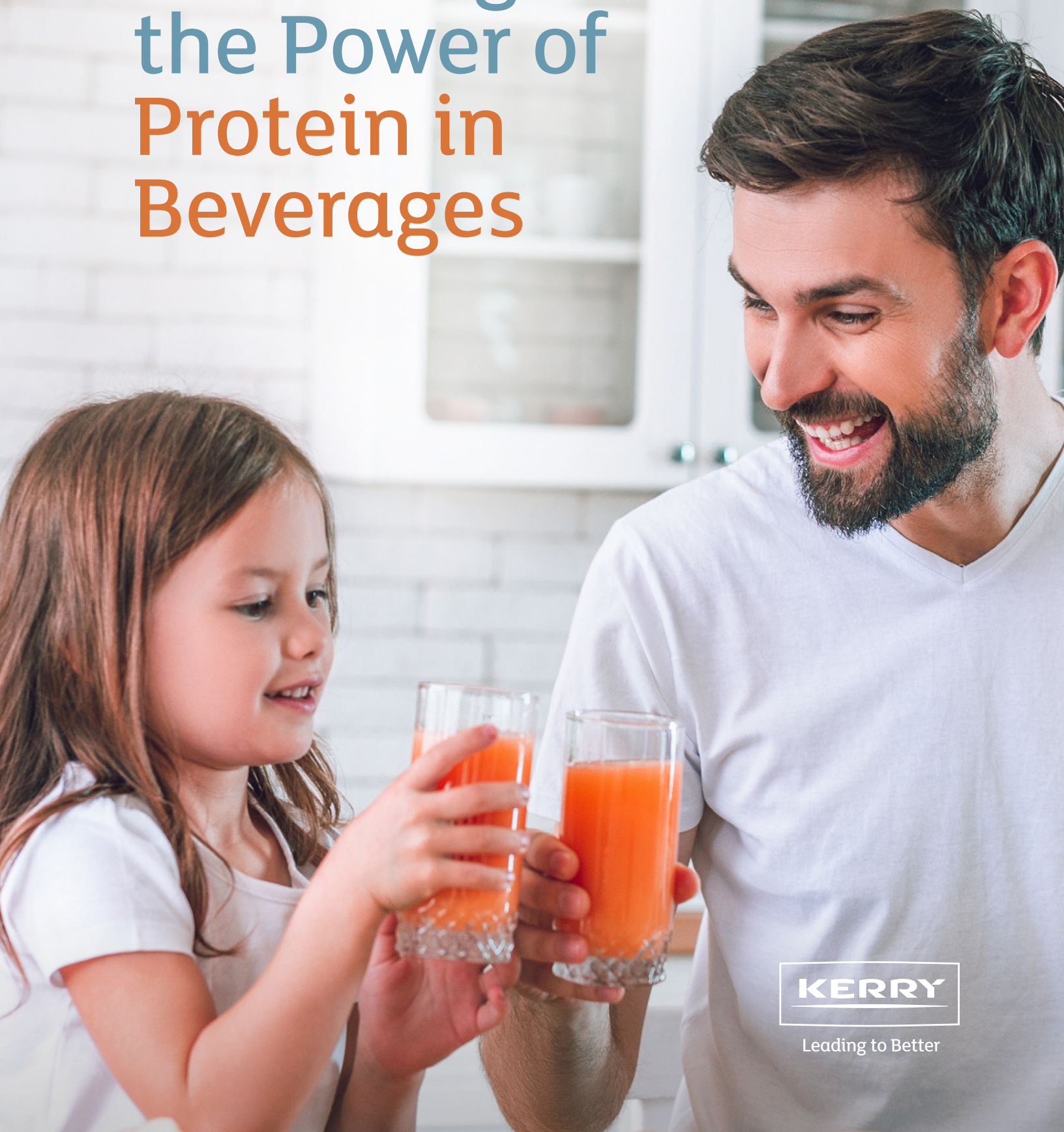


Unlocking the Power of Protein in Beverages



KERRY

Leading to Better

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a rapid growth category

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with untapped potential

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1 Functional beverages: a rapid growth category

Over the years, consumers have increasingly embraced the link between diet and health. As a result, their needs and expectations — beyond simply taste, variety and cost — now extend to added functionality in everyday foods and beverages.

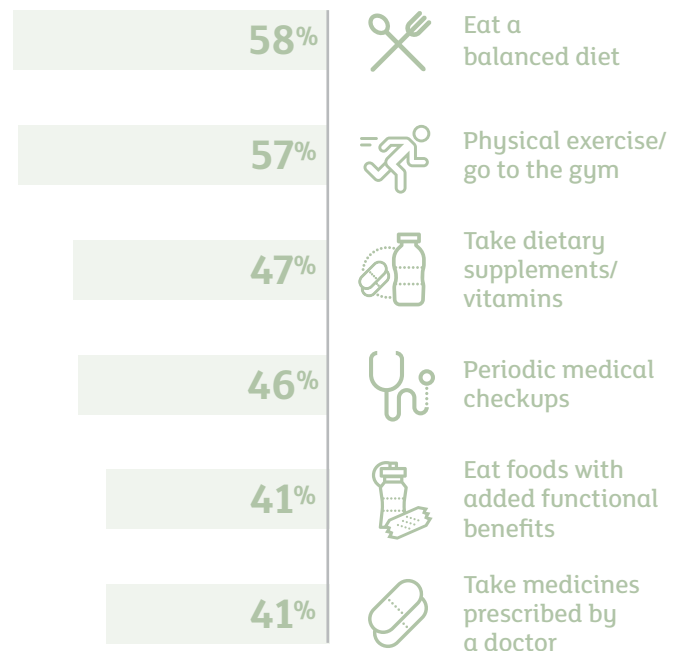
41% of consumers identified the use of foods and beverages with added functional benefits as one of the best ways to manage their health.¹

Global product launches with added functionality claims grew by 19% between 2014 and 2018 as brands introduced more functional additive ingredients to meet rising consumer demand.²

When asked which categories they seek out for functional ingredients, 57% of consumers selected nutritional beverages.¹



TOP WAYS OF MANAGING HEALTH¹



THE GLOBAL BEVERAGE CATEGORY

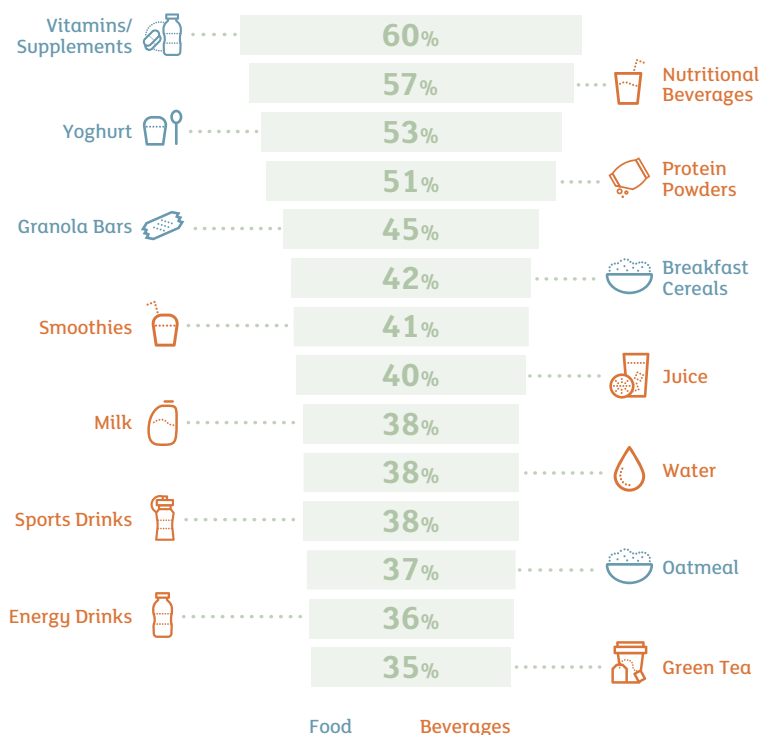
Carbonated soft drinks, functional beverages, sports drinks, fruit beverages, bottled water and others (excluding alcoholic) have an estimated value of nearly US\$ 850 bn in 2018 and are expected to surpass US\$ 1 trillion by 2022; this represents a 12% market expansion over the period.³ Within the category, functional beverages are predicted to emerge as the fastest-growing subsector in the coming years.

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in 2018

1. Kerry Proprietary Consumer Research *Proactive Health*, (US, n=1001, 2019).
2. Mintel New Product Launches Analysis, 2014–18.
3. Euromonitor Passport Analysis, August 2018.



CATEGORIES CONSIDERED FOR ADDED FUNCTIONALITY⁴



This shift in consumer demand presents beverage manufacturers with a promising opportunity to tap into the “feel good” factor around beverages with functional benefits.



THE POWER OF PROTEIN

Within the functional beverage category, a growing appreciation of the powerful health benefits of protein is driving demand for enriched drinks that pack a protein punch. Beverage manufacturers have continued to respond to protein’s rising popularity by adding it to various beverage products, including juices, waters, smoothies, coffees and more.



As a result, protein now represents 30% of the functional ingredients used in the beverage market.⁵

4. Kerry Proprietary Consumer Research *Proactive Health*, (US, n=1001, 2019).

5. Marketsandmarkets – Functional food ingredients report – 2018.

2 Protein: a “healthy hero” ingredient with untapped potential

Protein is known as a “**healthy hero**” ingredient, yet its significant health benefits are often underestimated. Scientific studies available substantiate these advantages.

GROWTH & REPAIR 1

Every cell in the human body contains protein. The basic structure of protein is a chain of amino acids that are the building blocks of our cells. Protein is essential for growth and development, especially in children, teenagers and during pregnancy. It also plays an important role in allowing the body to both repair cells and create new ones.

MUSCLE MAINTENANCE & GROWTH 2

Muscle is a specialized tissue that gives movement, strength and power to the body. Protein is the building block of muscle, and regular protein intake is essential to maintaining muscle mass.

When a muscle is challenged through resistance exercise, muscle fibers tear and break down. Protein is used to rebuild and grow these fibers, a process known as muscle protein synthesis. It is important to have adequate protein in the diet to ensure that muscle growth exceeds breakdown.⁶

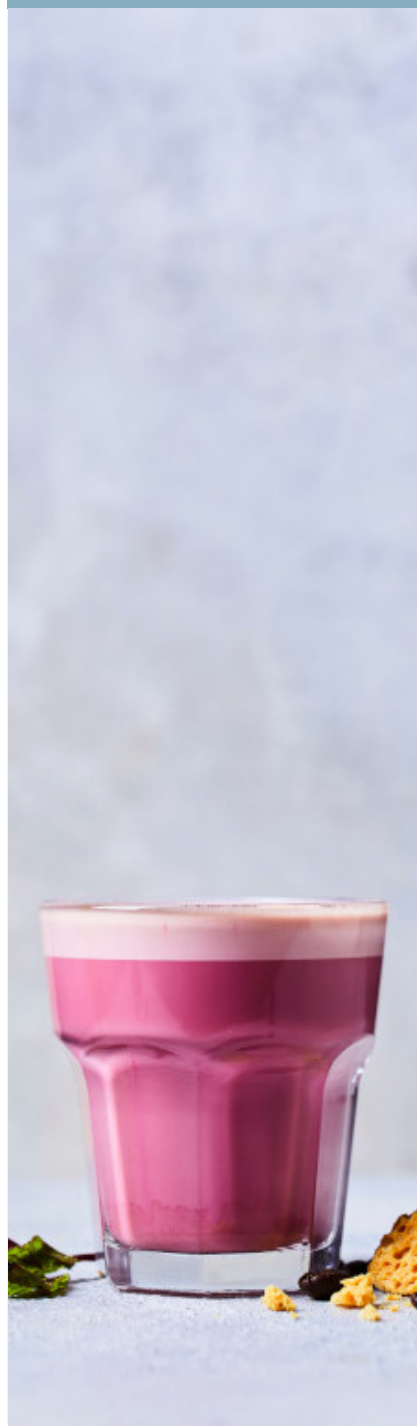
With ageing, over time, muscle breakdown can exceed growth; this muscle wasting is called sarcopenia. Increased protein intake, in combination with resistance training, can prevent the development of sarcopenia.⁷

STRONG BONES 3

Protein is important for forming and maintaining strong, healthy bones. Research shows that adequate protein intake is necessary to promote stronger bones and prevent osteoporosis, a disease that occurs when the bones become porous, weak and brittle. Protein intake is especially important for elderly women, who have a high risk of osteoporosis.⁸



6. Phillips, S., Hartman, J. and Wilkinson, S. (2005). Dietary protein to support anabolism with resistance exercise in young men. *Journal of the American College of Nutrition*, 24(2), pp. 134S–139S.
7. Deutz, N.E., et al. (2014). Protein intake and exercise for optimal muscle function with ageing: Recommendations from the ESPEN Expert Group. *Clinical Nutrition*, 33(6), pp. 929–936.
8. Rizzoli, R. and Bonjour, J. (2004). Dietary Protein and Bone Health. *Journal of Bone and Mineral Research*, 19(4), pp. 527–531.



4 SATIETY & WEIGHT CONTROL



Protein is more satiating than carbohydrates and fat; therefore, a meal rich in protein can leave you feeling fuller for longer. This extended feeling of satiety can result in a reduction in overall daily caloric intake, assisting in weight management. Protein intake also helps to maintain lean muscle mass by increasing metabolism and the burning of fat. Many studies show that diets high in protein are effective for weight management.^{9,10}

5 EXTRA ENERGY



In the absence of carbohydrates, protein can be used by the body as an energy source. Protein delivers four calories per gram consumed, the same amount of energy provided by carbohydrates. Excess protein in the diet is broken down by the liver and converted to glucose or fatty acids that are then stored as an energy reserve.

6 HEALTHY IMMUNE SYSTEM



Protein is an essential part of the immune system. Immune system powerhouses, such as antibodies, rely on protein to fight off harmful bacteria and viruses. Consuming adequate protein ensures that the immune system can defend and protect the body from infection.¹¹

7 BLOOD GLUCOSE REGULATION



Protein intake can help regulate blood glucose control after meals. Protein has a stimulating effect on insulin secretion from the pancreas — the main hormone involved in regulating blood sugars after a meal.¹² Many studies have shown that whey protein is particularly effective in managing blood sugar levels, and is a potential strategy for glycemic management in patients with Type 2 diabetes.¹³

9. Paddon-Jones, D., et al. (2008). Protein, weight management, and satiety. *The American Journal of Clinical Nutrition*, 87(5), pp. 1558S–1561S.
10. Westerterp-Plantenga, M., Lemmens, S. and Westerterp, K. (2012). Dietary protein – its role in satiety, energetics, weight loss and health. *British Journal of Nutrition*, 108(S2), pp. S105–S112.
11. Daly, J.M., et al. (1990). Effect of dietary protein and amino acids on immune function. *Critical Care Medicine*, 18:S86–S93.
12. Farnsworth, E., et al. (2003). Effect of a high-protein, energy-restricted diet on body composition, glycemic control, and lipid concentrations in overweight and obese hyperinsulinemic men and women. *The American Journal of Clinical Nutrition*, 78(1), pp. 31–39.
13. Mignone, L. (2015). Whey protein: The “whey” forward for treatment of type 2 diabetes? *World Journal of Diabetes*, 6(14), pp. 1274–1284.



HEART HEALTH

8

Protein has been shown to reduce high blood pressure and low-density lipoprotein (LDL) cholesterol, two key risk factors in cardiovascular disease. However, the protein must be consumed as part of a balanced diet, whereby the protein sources are not derived primarily from foods that are typically related to increases in blood pressure and LDL cholesterol, i.e., the protein sources should not be high in saturated fat.¹⁴



PRODUCTION OF ENZYMES & HORMONES

9

Protein is necessary for the production of the enzymes and hormones that control many body processes. Enzymes speed up thousands of metabolic reactions, such as the digestion of food and the conversion of nutrients to energy. Hormones are chemical substances produced by the network of organs and glands that make up the endocrine system. Hormones control many functions in our body, including growth, reproduction, sleep, mood, etc.



SKIN, HAIR & NAIL HEALTH

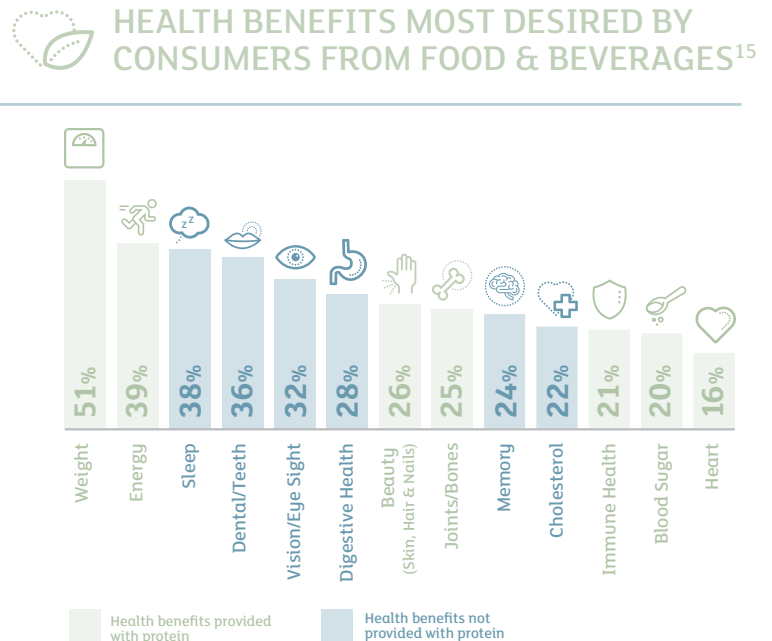
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Collagen and keratin are structural proteins generated by the body. Collagen provides elasticity to the skin. Keratin is a key component in the structure of hair and nails. Adequate protein intake provides the building blocks for these proteins, and for the maintenance and repair of healthy skin, hair and nails.



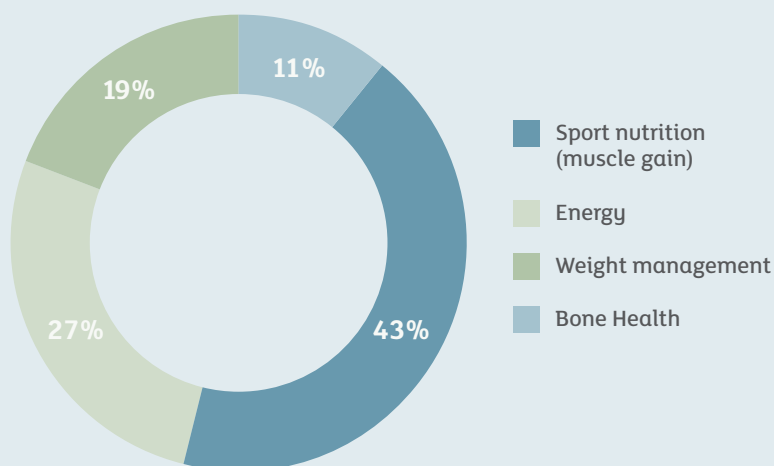
14. Appel, L., et al. (2005). Effects of protein, monounsaturated fat, and carbohydrate intake on blood pressure and serum lipids. *JAMA*, 294(19), p. 2455.

The graph to the right shows the health benefits most desired by consumers from their foods and beverages. As previously mentioned, protein promotes many functional benefits and can provide solutions to a significant number of these health priorities, including weight, energy, beauty (“from the inside out”), joint/bone health, blood sugar management and heart health.¹⁵



There is an opportunity for beverage manufacturers to develop and promote products with proteins that target one or more of their customers’ identified needs. Currently, most functional beverage products on the market with added protein have on-packaging marketing that advertises muscle gain and energy benefits for sports nutrition or weight management.¹⁶

COMMON ON-PACK CLAIMS FOR PROTEIN BEVERAGES¹⁶



This means there is a market gap for beverage manufacturers to develop targeted protein products that offer the solutions wellness consumers want, i.e., related to beauty, bone/joint health, a strong immune system, blood sugar management and heart health.

15. Kerry Proprietary Consumer Research Proactive Health, (US, n=1001, 2019).

16. Mintel, GNPD (2019).

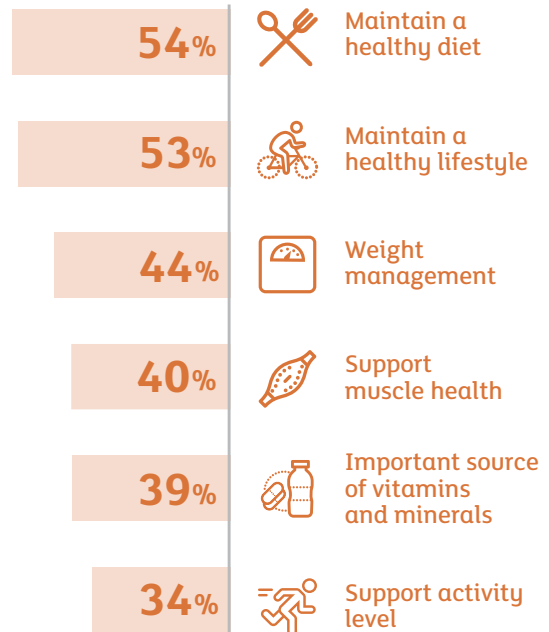
3 Protein and the wellness consumer

CONSUMERS PERCEIVE PROTEIN AS HEALTHY

Protein has moved well beyond the hardcore athlete and is now thriving in the general wellness space. Maintaining a healthy diet and lifestyle are the top reasons consumers purchase protein products.¹⁷



INDICATE WHY YOU USE PROTEIN PRODUCTS¹⁷



CONSUMERS WANT ALTERNATIVE PROTEIN SOURCES

Dairy protein remains the most desired protein source in beverages, although plant-based protein beverage sales are rising quickly. There are three key drivers for this increase in consumer interest in plant-based proteins:

1

RISE IN ALLERGIES & INTOLERANCES

There is a growing demand for allergen-free food. Over half of protein users report “dairy-free” as their most important consideration when purchasing protein products.¹⁷

2

ETHICS & ENVIRONMENTAL SUSTAINABILITY

A full 62% of protein users cite sustainability and animal welfare as important factors when purchasing a protein product. Many plant-based protein products have strong sustainability stories and claim a lower carbon footprint than animal-derived proteins.¹⁷

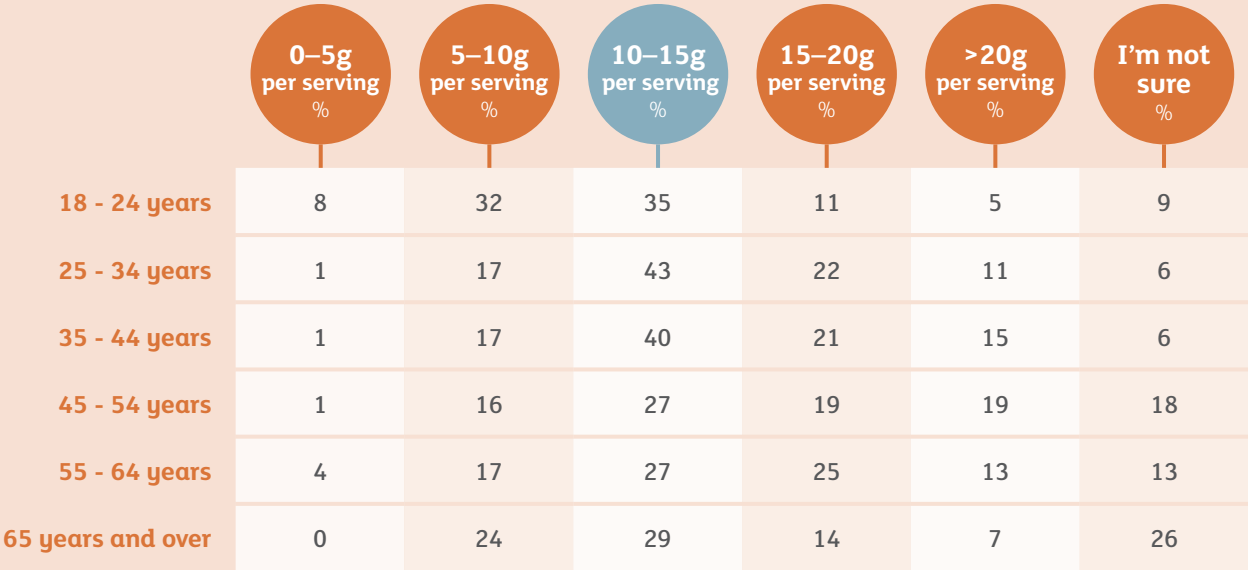
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HEALTH & WELLNESS

71% of consumers view protein from plant sources to be healthy compared to 42% viewing animal derived protein to be healthy.¹⁷

CONSUMERS WANT PROTEIN IN THEIR BEVERAGES — BUT HOW MUCH?¹⁷

Across all age groups, 10–15 grams of protein per serving is the preferred quantity of protein for beverages. The second most preferred amount varies by age.¹⁷



KEY TRENDS

Consumers aged 45+ are the segment most interested in beverages with the highest protein content. This aligns with the fact that ageing is associated with a decline in muscle mass and bone health. As we age, the body becomes less efficient at using protein to maintain muscle strength. Consumers are approaching ageing proactively by incorporating more protein into their diets. Maintaining muscle mass throughout life is key for staying active and independent and is one of the main considerations for healthy ageing.



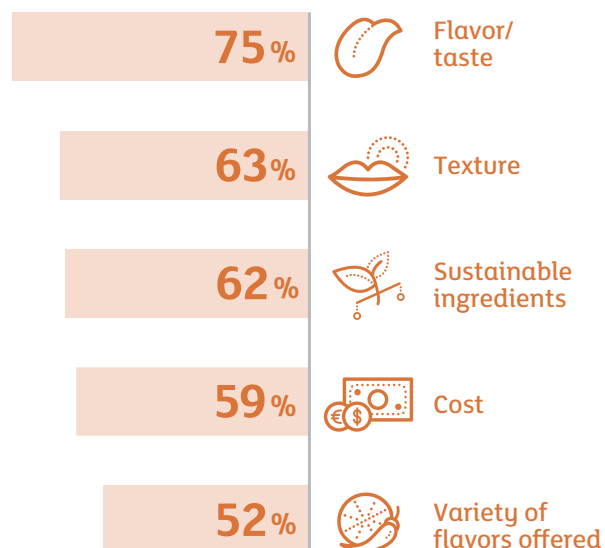
17. Kerry Proprietary Research (US, n=1800, 2018).

HOW MUCH PROTEIN FOR HEALTHY AGEING?

The ideal protein target for older adults is hotly debated in the scientific literature, and much research is being focused to determine optimum recommended levels. Recently, several international experts' groups^{18,19} have proposed an increased recommended daily dietary allowance (RDA) for protein in older adults from 0.8g per kg to 1–1.2g per kg.



MOST IMPORTANT FACTORS WHEN PURCHASING PROTEIN PRODUCT¹⁷



CONSUMERS REFUSE TO COMPROMISE ON TASTE OR TEXTURE

As many as 72% of consumers believe flavor/taste is the most important factor when making a purchase decision on a protein product. Other important factors include texture and sustainable ingredients, both of which rank ahead of cost.²⁰

Improving consumers' taste perception of high-/added-protein products is critical given that, across all countries, products with such a protein claim were less likely to be perceived as "good tasting" when compared to products without the claim.²⁰

17. Kerry Proprietary Research (US, n=1800, 2018).

18. Bauer J., et al. (2013). Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from the PROT-AGE Study Group. *Journal of the American Medical Directors Association*.

19. Deutz, N.E., et al. (2014). Protein intake and exercise for optimal muscle function with ageing: Recommendations from the ESPEN Expert Group. *Clinical Nutrition Journal*.

20. Mintel Purchase Intelligence – What you need to know about high-protein products, *Base: users aged 18+* (US: 64,600; UK: 33,600; France: 21,100; Australia: 38,800); *without high/added protein* (US: 1,115,900; UK: 628,600; France: 783,700; Australia: 418,700) (Apr 2018–Oct 2018).

4 Emerging innovations in protein beverages

Kerry has been a trusted protein supplier for almost 50 years. Today, Kerry has market-leading protein technology and applications expertise, coupled with proven taste knowledge and in-depth nutritional science capability.

As a company, we have an extensive knowledge of processing proteins. We work in partnership with our customers, sharing our understanding of taste and our extensive beverage applications expertise as we strive to create the “perfect” protein beverage to meet their target goals.

Kerry offers premium protein ingredients with high nutritional and organoleptic qualities. Using our expertise, we develop and bring to market protein solutions honed for our customers’ beverage categories.

Kerry offers an extensive nutritional and functional protein lineup:

- Dairy protein: milk protein isolates (MPI) and milk protein concentrates (MPC)
- Plant proteins
- Protein hydrolysates: dairy and plant-based sources



INNOVATIVE CONCEPTS SHOWCASING KERRY'S PROTEIN BEVERAGE EXPERTISE



TROPICAL PRO-JUICE

A vegan protein juice made with our plant protein **ProDiem™ Refresh**. ProDiem Refresh is a vegan, allergen-free protein that delivers a clean and refreshing taste in low-pH beverages. Using this protein, vegan protein juices can be manufactured with great taste and low viscosity, creating a uniquely refreshing taste experience.



PLANT POWER ENERGY PROMILK

This coffee-flavored almond milk, fortified with our plant protein **ProDiem™**, is an ideal choice for health-conscious consumers looking for a dairy-free nutritional beverage.



PROACTIVE BONE HEALTH PROSHAKE 50+

A nutritious protein shake using our **Ultramor™** milk protein and fortified with calcium, magnesium, vitamin D and vitamin K to support healthy bone ageing, this product offers a delicious mocha flavor that consumers will enjoy as a healthy snack.



ENERGY VEGAN PRO-WATER

This is a vegan protein water that uses our plant protein **ProDiem™ Refresh** and delivers an allergen-free protein with a clean and refreshing taste in low-pH beverages. Using this protein, vegan protein waters can be manufactured with great taste, low viscosity and clarity for a more refreshing experience.



PROTEIN BEAUTY MILK

Protein Beauty Milk is a nutritious beauty milkshake that uses our **Ultramor™** milk protein and is fortified with collagen and Vitamin C. Vitamin C contributes to normal collagen formation to support the natural functioning of skin and cartilage. Protein intake is essential for strong hair and nails. With a delicious natural strawberry flavor, consumers can enjoy this drink at breakfast or between meals as a healthy and versatile snack.



ABOUT KERRY

As consumers demand a return to real food and beverage products, Kerry is responding with better, more authentic and nutritious taste experiences.

Kerry's focus on Taste & Nutrition combines our multi-sensory aroma and texture experience with in-depth knowledge of people, life stage and daily nutritional needs. By partnering with Kerry, customers are taken on a journey to make food, beverage and pharma products that people enjoy and feel better about.

We bring to the table our strong food heritage with 40 years of experience, global insights, marketplace knowledge, culinary and applications expertise and unique solutions that meet consumers' needs. Kerry began as a dairy cooperative in Ireland, committed to producing real and wholesome ingredients.

As we've grown, we continue to provide solutions that satisfy a fundamental need: to eat, to eat well, and to be healthy.

We call this Leading to Better.

To find out more about how Kerry can help you unlock the power of protein beverages, contact your local Kerry representative or visit [Kerry.com](https://www.kerry.com)