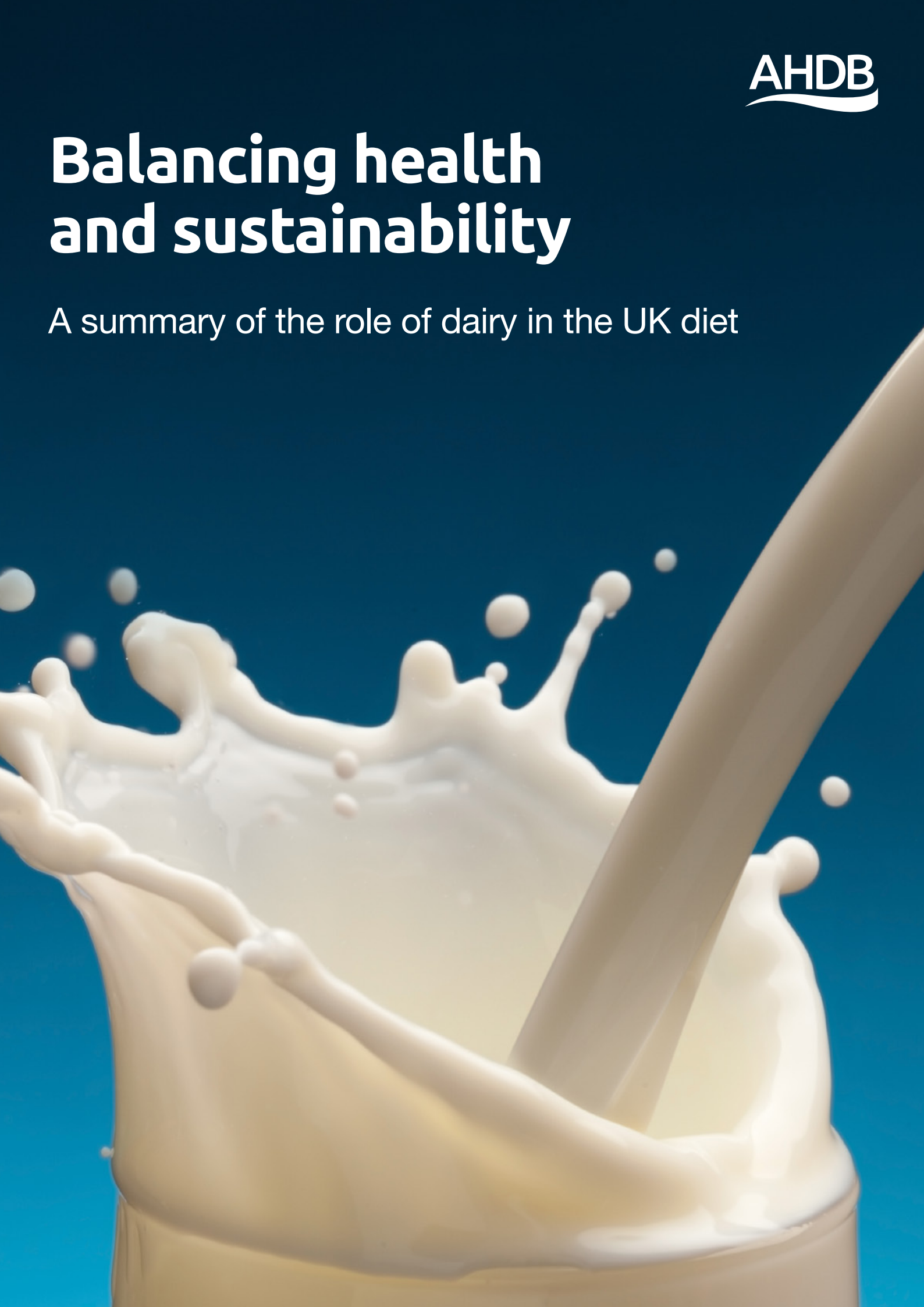
AHDB

Balancing health and sustainability

A summary of the role of dairy in the UK diet



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Introduction

Dairy plays a key role in the UK diet, providing high-quality protein and essential nutrients that support lifelong health. It offers an accessible source of nutrition, contributing to dietary quality in ways that are difficult to replicate.

Environmental impacts of dairy production are a key part of food sustainability discussions, and the UK dairy sector is working to provide nutrient-dense food for a growing population while protecting and enhancing the natural environment. This summary highlights some of the key messages from the report Balancing health and sustainability: *The role of dairy in the UK diet.*

TOP 10 DAIRY FACTS

1. Research shows that the overall health benefits of dairy foods are stronger when you consider the whole food, not just its separate parts.
2. As a guide, 350 ml to 500 ml/day of dairy can meet key micronutrient needs when combined with a balanced diet; three portions/day is a practical target for children and adults.
3. Iodine deficiency across all age groups has increased, with adolescent girls (11–18 years) and adults (19–64 years) now showing mild deficiency.
4. Dairy intake supports bone health across the lifespan by helping children achieve peak bone mass, slowing bone loss in adults, and reducing falls and fractures in older adults. Almost 1 in 5 (18%) of teenage girls have inadequate calcium intakes (below the LRNI).
5. Milk and dairy food offer a simple and affordable solution to help address micronutrient shortfalls. A portion of milk (200 ml) would provide 43% of iodine, 33% of calcium, 40% of vitamin B2 and 107% of vitamin B12 recommendations for a female adult.
6. Overall, evidence shows dairy is either neutral or beneficial for CVD risk, with fermented products such as yogurt and cheese showing particularly favourable effects.
7. Dairy can support healthy weight by promoting fullness, preserving muscle and reducing fat mass, and can be a nutrient-dense option for individuals undergoing weight-loss therapies.
8. Strong evidence supports dairy's protective role against colorectal cancer, mainly due to calcium. The World Cancer Research Fund (WCRF) recommends including calcium-rich foods, such as dairy, for colorectal cancer prevention.
9. The emissions intensity from UK milk production has fallen by 22% since 1990, with milk production accounting for 2.8% of total UK GHG emissions.
10. Farms play a central role in managing natural resources and ecosystem services. UK farmers are adopting innovative land management practices, including agroforestry, tree fodder integration and circular livestock systems that recycle nutrients, minimise waste and optimise output.

Dairy's role in a healthy and sustainable diet

A sustainable, healthy diet is essential for health and the environment. Global food-based dietary guidelines are increasingly advocating for a reduction in animal-sourced foods for health and sustainability. However, this often overlooks local diet composition, cultural acceptability and key nutritional factors, such as essential amino acid intake, micronutrient bioavailability and overall dietary adequacy.

Significant reductions in animal-sourced foods may worsen existing micronutrient deficiencies and lower protein quality, particularly among vulnerable groups, such as young children, teenagers, pregnant and breastfeeding women and older adults. Dairy supports nutrient adequacy in these vulnerable groups while aligning with FAO/WHO principles of a sustainable, healthy diet.

According to FAO/WHO, sustainable, healthy diets are "dietary patterns that promote all dimensions of individuals' health and wellbeing; have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable."[1]

The UK's Eatwell Guide recommends a plant-rich diet, with the two largest food groups – fruit and vegetables and starchy foods – being plant-based. The Eatwell Guide also recognises the important contribution dairy makes to providing key nutrients – high-quality protein, calcium, iodine and B-vitamins, which are essential at every stage of life.

Eating more in line with the UK Eatwell Guide would lead to significant health and environmental benefits. However, full adherence to the Eatwell Guide remains extremely low (less than 0.1%).[2]

Diets that are good for the environment must balance sustainability with nutrient adequacy, focusing on improving overall dietary patterns and diet quality. Dairy is nutrient-dense, widely accessible and culturally embedded, making it ideally positioned to support population health and sustainable diets.

As a guide, 350 ml to 500 ml/day of dairy (e.g. a 200 ml glass of milk + yogurt pot + small portion of cheese) can meet key micronutrient needs when combined with a balanced diet;[3] three portions/day is a practical target for children[4] and adults.[5]

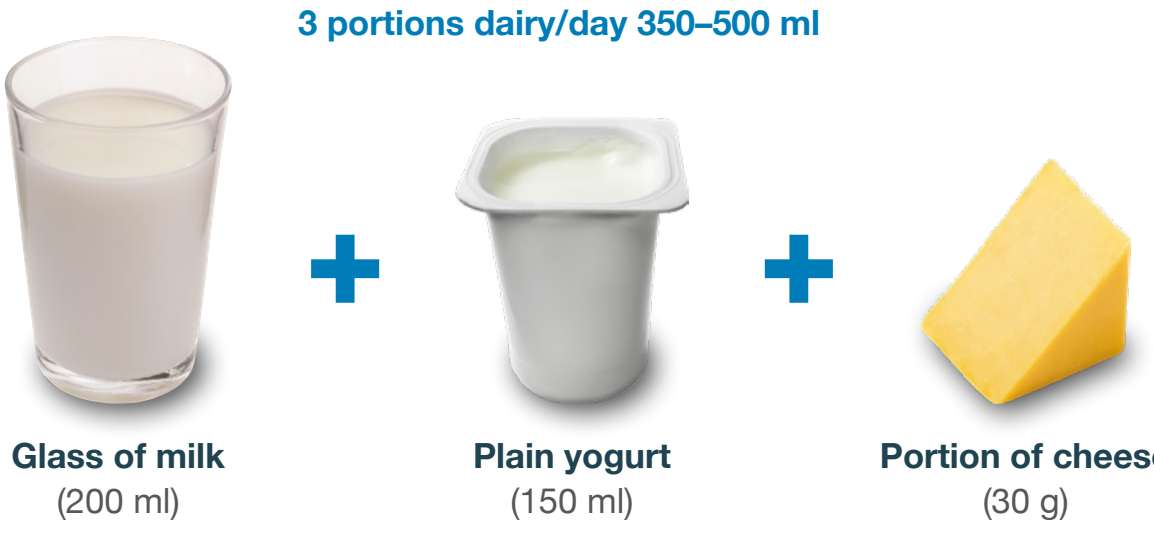
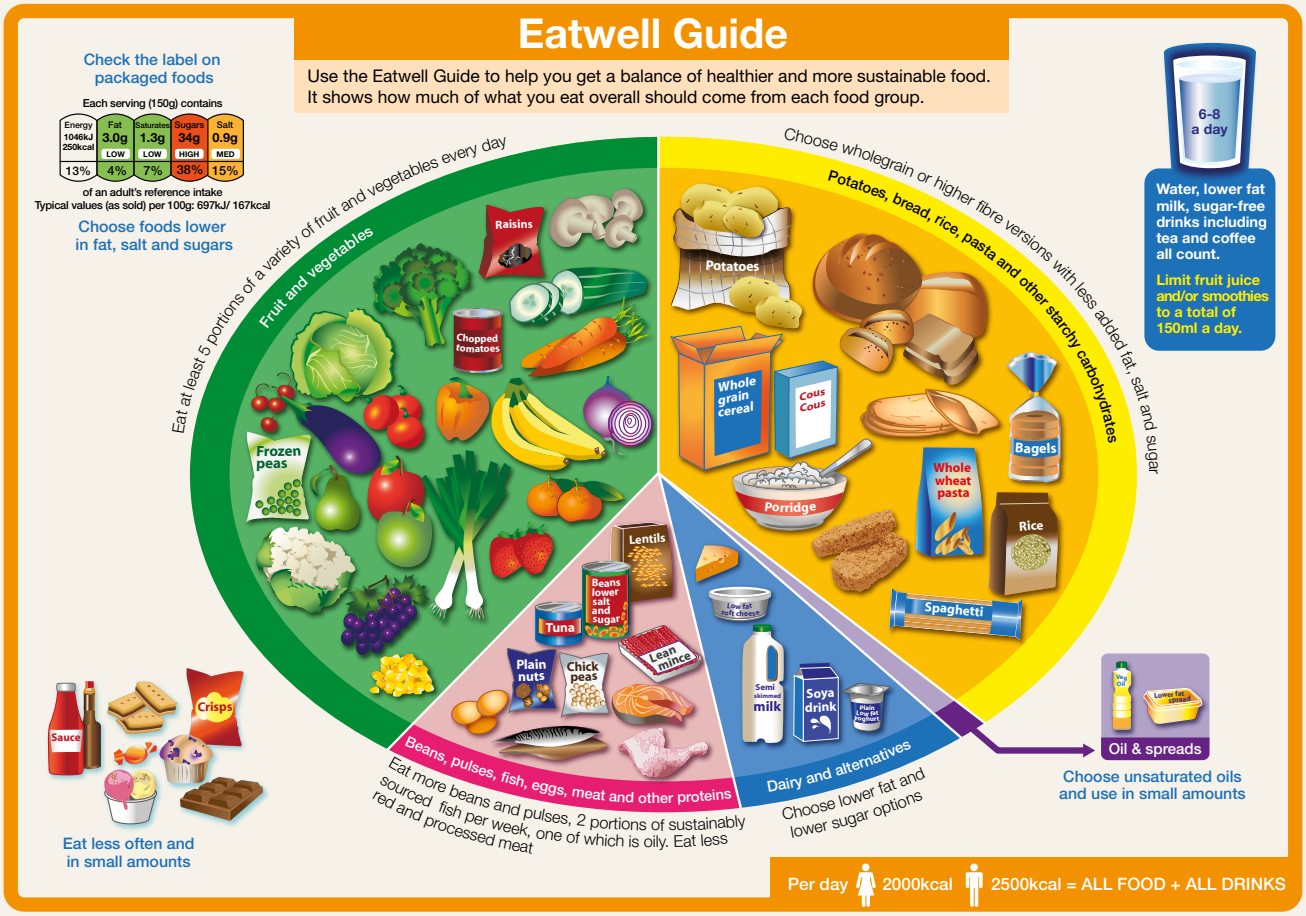


Figure 2. How to achieve three servings of dairy a day.



Source: Public Health England in association with the Welsh Government, Food Standards Scotland and the Food Standards Agency in Northern Ireland

Figure 1. The Eatwell Guide – The UK government's healthy eating recommendations. The UK's food-based dietary guidelines are represented by the Eatwell Guide, which is a pictorial representation of government healthy eating advice. The guide represents a balanced diet and is applicable to children over five years, adolescents and adults. It does not apply to children under two as they have different nutritional needs.

Source: Public Health England, in association with the Welsh Government, Food Standards Scotland and the Food Standards Agency in Northern Ireland.

Nutritional composition of dairy

Milk is primarily composed of water, with lactose, protein, fat, minerals and vitamins. It also contains trace amounts of enzymes, bioactive peptides, cytokines, hormones and lipids, such as conjugated linoleic acid, contributing to its functional properties.

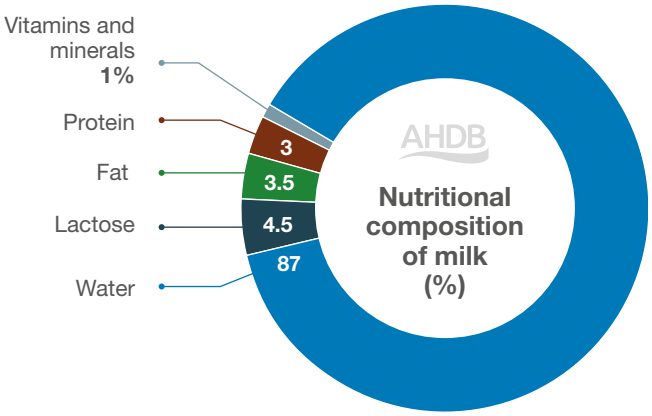


Figure 3. Nutritional composition of milk

Protein: Dairy proteins include caseins (80%) and whey (20%), both high-quality complete proteins providing all essential amino acids and easy to digest. Whey is especially rich in branched-chain amino acids (leucine, isoleucine and valine) and lysine, while casein provides histidine, methionine and phenylalanine. Branch-chain amino acids (BCAA) are particularly vital for inducing protein synthesis, essentially combining the components to form a protein. Protein, crucial for muscle growth, relies on the three BCAAs. Leucine, which is high in dairy, is not only a building block for protein synthesis, it also initiates the process,[6,7] making milk and dairy valuable for supporting growth in children and maintaining muscle mass and strength in older adults.

Fat: The main type of fat in milk is saturated fat, with some monounsaturated fats and a small amount of polyunsaturated fats. Milk also has small amounts of natural trans fatty acids, produced by bacteria in the cow's stomach. Science indicates that these include natural trans fatty acids such as conjugated linoleic acid (CLA), which may be linked to beneficial health effects.[8]

Carbohydrate: The natural sugar in milk is lactose, a disaccharide which is broken down into glucose and galactose in the digestive system, with galactose converted into glucose in the liver before absorption. As lactose is naturally present in milk, it's not considered a "free sugar". However, some milk and dairy products (e.g. flavoured milk drinks, yogurts and ice cream) contain added sugars and therefore contribute to intakes of free sugars. Among common carbohydrate sources, lactose is the least likely to cause tooth decay.[9] It stimulates saliva production, which helps neutralise acidity in the mouth, and is poorly fermented by the oral microbiota, making it less harmful to teeth than other carbohydrates.[9]

Good for muscles

Milk, cheese and yogurt are great choices as they are rich in protein and a source of calcium and potassium.

Protein contributes to the maintenance and growth of muscle mass.

Calcium and potassium contribute to normal muscle function.

Figure 4. Muscular health benefits of milk and dairy

> "From supporting growth in children to preserving strength in older adults, dairy proteins deliver high-quality nutrition across the lifespan"

The dairy matrix – Dairy is more than the sum of its nutrients

There is a growing understanding that certain foods may offer distinct nutrition and health benefits. These effects are influenced not just by individual nutrients but by the combined action of nutrients and non-nutrient components within the food matrix.

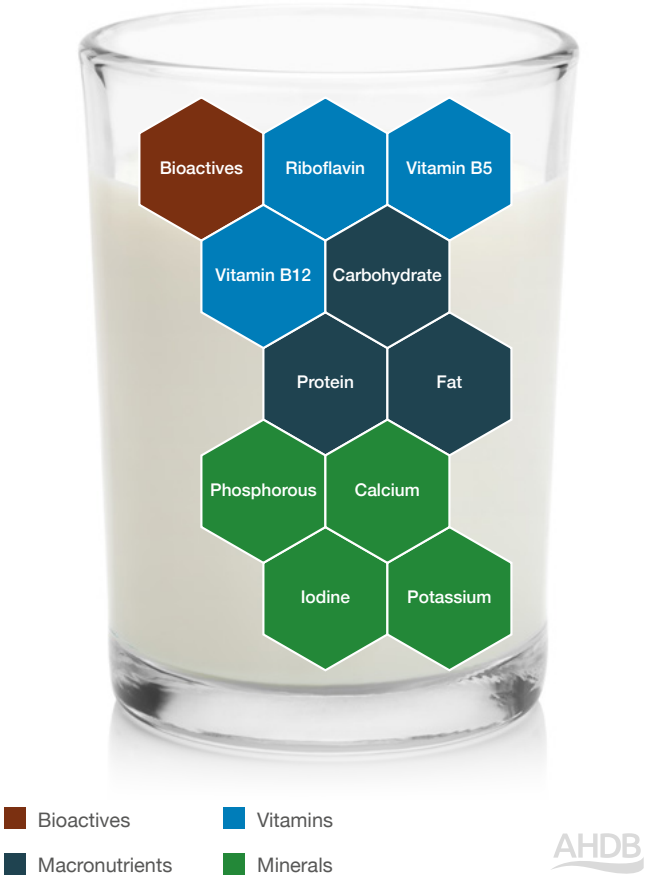


Figure 5. Illustrating the structure and nutrient interactions within the matrix of dairy products

The dairy matrix

Milk is one of the most complex of foods and has a distinct food matrix. The dairy matrix includes a diverse combination of nutrients,bioactive compounds, microorganisms and complex physical structures, like milk fat globule membranes. The composition, structure and interaction of compounds within the dairy matrix can impact how nutrients are absorbed, digested and metabolised – for example, how our body responds after eating, in terms of stomach emptying, appetite and food consumed.

Health effects greater than the sum of its individual parts

Research shows that the overall health benefits of dairy foods are stronger when you consider the whole food, not just its separate parts.[10]

For example, dairy provides nutrients linked to lower blood pressure, including calcium, magnesium, potassium and, uniquely, phosphorus, which shows benefits only when sourced from dairy,[11] highlighting the potential importance of the dairy matrix.

Dairy is a diverse food group, and different dairy products (e.g. milk, cheese, yogurt) have distinct food matrices that may affect their functional and health properties.

- Fermented dairy contains increased concentrations of beneficial compounds such as organic acids, enzymes and bioactive peptides.[12] Bioactive peptides released from milk and dairy during digestion, or fermentation, may contribute to its blood-pressure-lowering effects.[13]
- Dairy offers several bone-supporting nutrients, and fermented dairy products may further enhance the calcium bioavailability and absorption, as well as gut health, further supporting bone health.[14]

Understanding this whole food effect can help refine dietary guidance and maximise the nutritional benefits of dairy for people at every stage of life.

> “The dairy matrix provides nutrients like calcium, magnesium, potassium and phoshorus linked to lowering blood pressure”

Dairy – The affordable solution to micronutrient shortfalls

Milk and dairy products offer a simple and affordable solution to help address micronutrient shortfalls. Milk, yogurt and cheese make important contributions to intakes of key micronutrients (see table 1), including calcium, iodine, vitamin A, vitamin B5, phosphorus, folate, potassium, selenium, zinc and choline.

Table 1. Percentage contribution of milk and milk products and alternatives to micronutrient intakes, by age

Micronutrient	Age (years)					
	1.5–3	4–10	11–18	19–64	65–74	75+
Calcium	50	41	33	34	42	45
Iodine	54	48	38	34	42	44
Vitamin B12	43	35	26	27	30	32
Vitamin B2	42	35	26	27	32	34
Folate	16	11	9	9	11	12
Vitamin A	28	22	18	16	18	18
Retinol	48	39	32	30	32	32
Potassium	23	18	14	12	15	17
Selenium	16	11	8	7	10	11
Zinc	27	20	14	15	18	21

Source: NDNS data, OHID 2025[15]

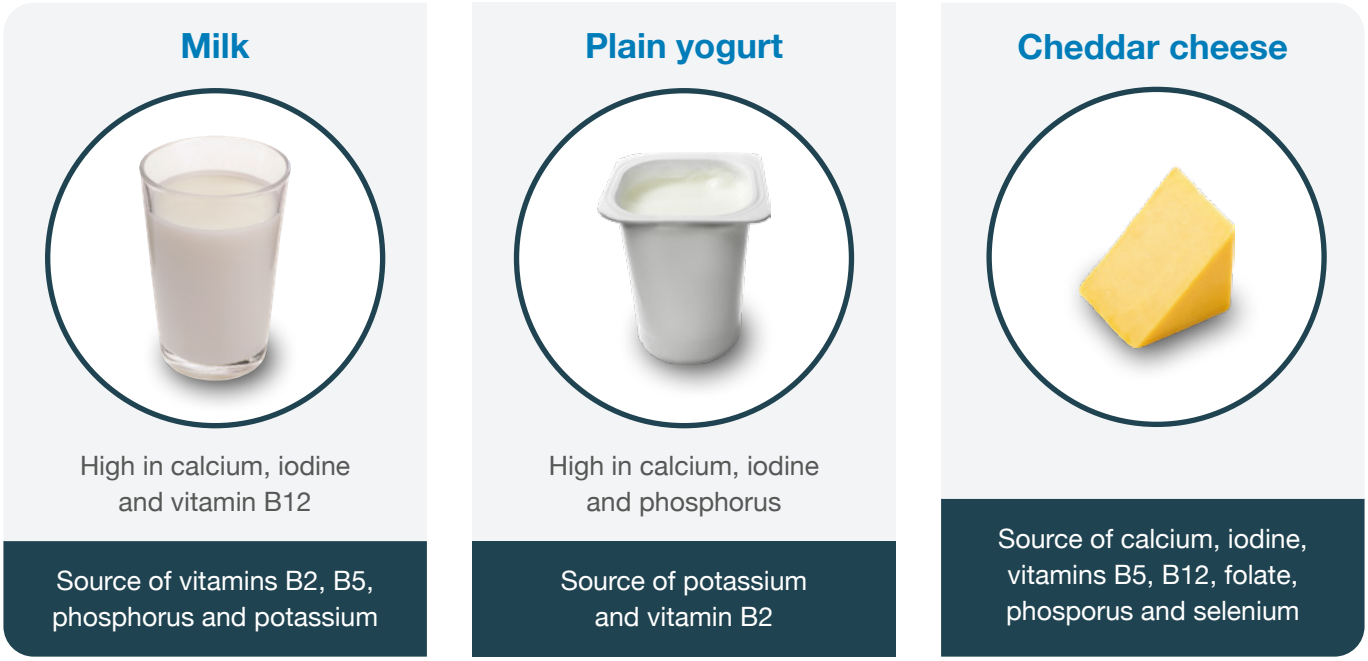


Figure 6. How milk, yogurt and cheese contribute to vitamin and mineral intake.

A 200 ml portion of milk provides 43% of iodine, 33% of calcium, 40% of vitamin B2 and 107% of vitamin B12 of the daily recommended intake for a female adult.[15]

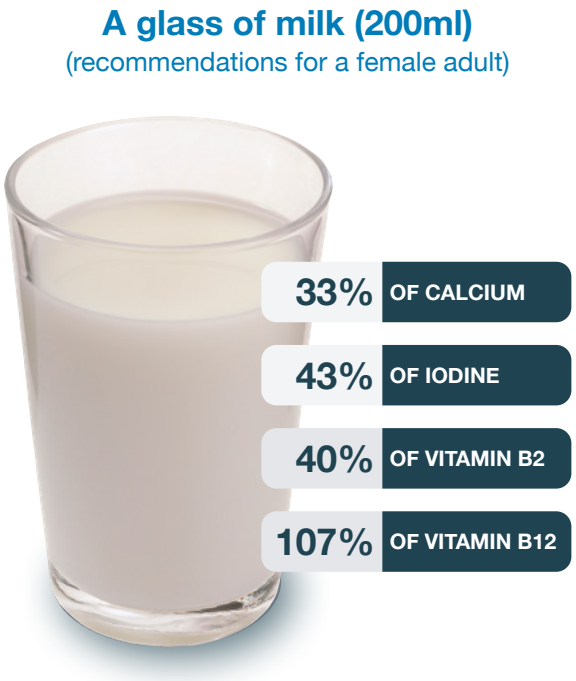


Figure 7. The impact of a 200 ml glass of milk on women's key nutrient needs

Consuming one portion each of milk, yogurt and cheese (i.e. three portions of dairy products per day) would provide 161% of vitamin B12, 87% of calcium, 86% of iodine and 79% of vitamin B2 recommendations for a female adult.[15]

Calcium

Average daily calcium intakes among 11–18-year-olds are currently below recommended levels at 842 mg for boys and 677 mg for girls, with 15% of boys and 18% of girls falling below the LRNI.[15] Women aged 65–74 average 779 mg a day – also below the 1,000 mg recommended for postmenopausal women.[17]

Table 2. Reference nutrient intakes for calcium

Age	Calcium (mg/day)
0–12 months	525
1–3 years	350
4–6 years	450
7–10 years	550
11–18 years	1000 (boys) 800 (girls)
Adults 19+ years	700
Those who are breastfeeding	1250
Postmenopausal[a]	1000
If taking an osteoporosis medication[b]	1000

Source: DH, 1991[18]; [a]British Menopause Society[17]; [b]Royal Osteoporosis Society

Milk and dairy product intake provides around one-third of daily calcium for adolescents and adults and half for young children (1.5–3 years).[16] Milk alone contributes between 22% and 32% of calcium intake depending on age.[15]

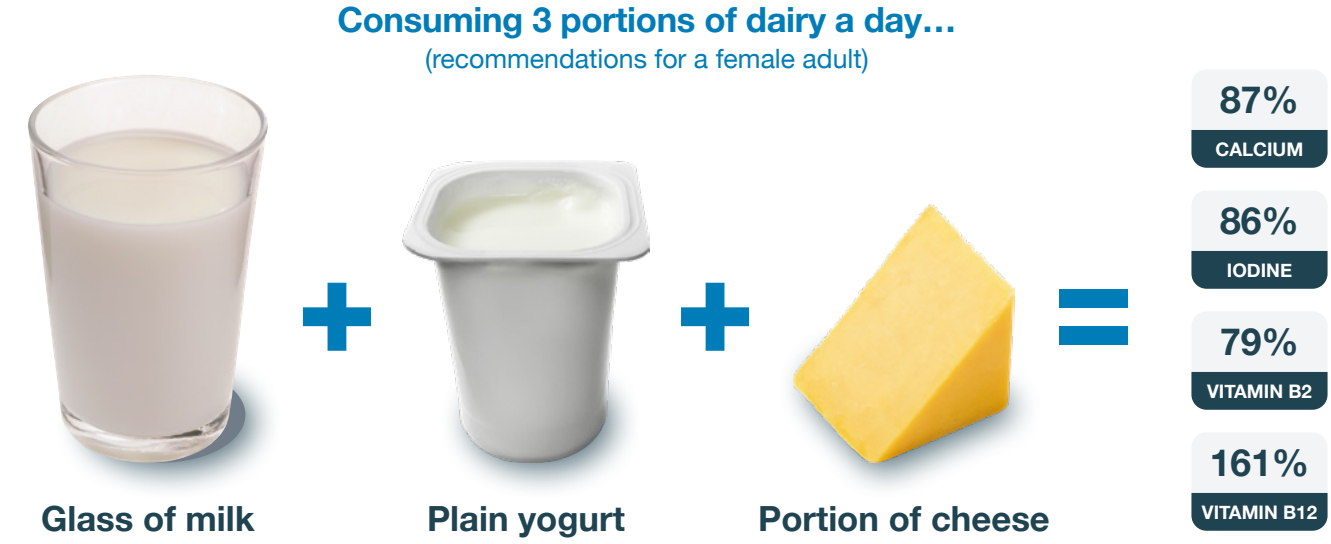


Figure 8. How three portions of dairy a day suport daily intake of key vitamins and minerals

Calcium bioavailability

Plant-based diets are rising in the UK, and the bioavailability (how much of a nutrient your body can actually absorb and use) is an important consideration as this may differ between micronutrients found naturally within the food matrix and those that are added as fortificants. A recent study reported the bio-accessible calcium from plant-based drinks was surprisingly low (less than 5%, compared with 30% for milk).[20] This was due to the low solubility of the calcium used for fortification and the potential presence of phytates that can bind to minerals, making them harder for the body to absorb.

Iodine

Iodine is essential for the production of thyroid hormones, which regulate the body's metabolism, energy use and overall growth. These hormones are especially important for brain and nervous system development before birth and during early childhood, making adequate iodine intake crucial during pregnancy and early life.

The latest NDNS data confirms increased iodine deficiency across all age groups, with adolescent girls (11–18 years) and adults (19–64 years) showing mild deficiency (see figure 10).[15] Population groups most at risk of deficiency are adolescent girls, women of childbearing age, and those following a vegan or mainly plant-based diet. Iodine deficiency during pregnancy can impact the developing child's cognitive outcomes, such as increased hyperactivity and reduced language skills.

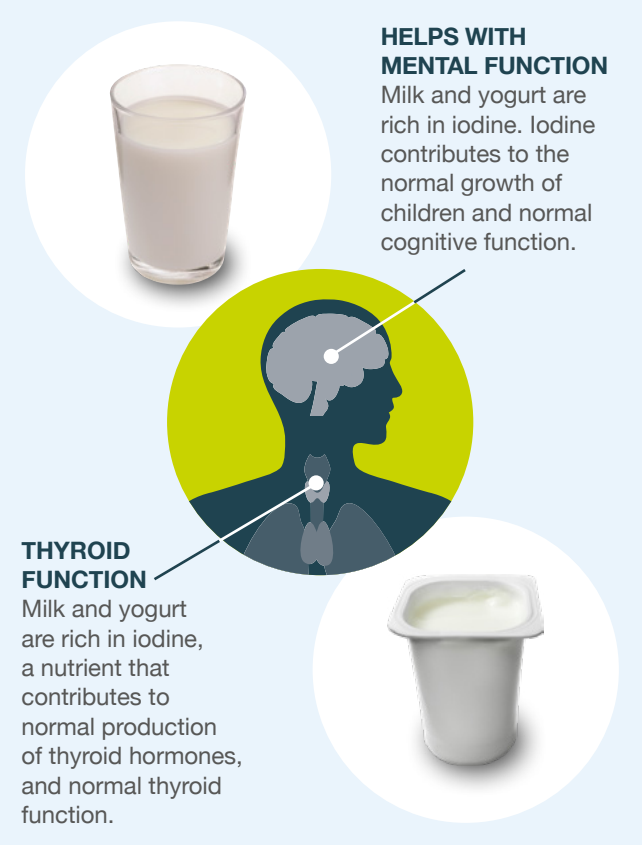


Figure 9. How dairy supports iodine intake aswell as growth and mental development.

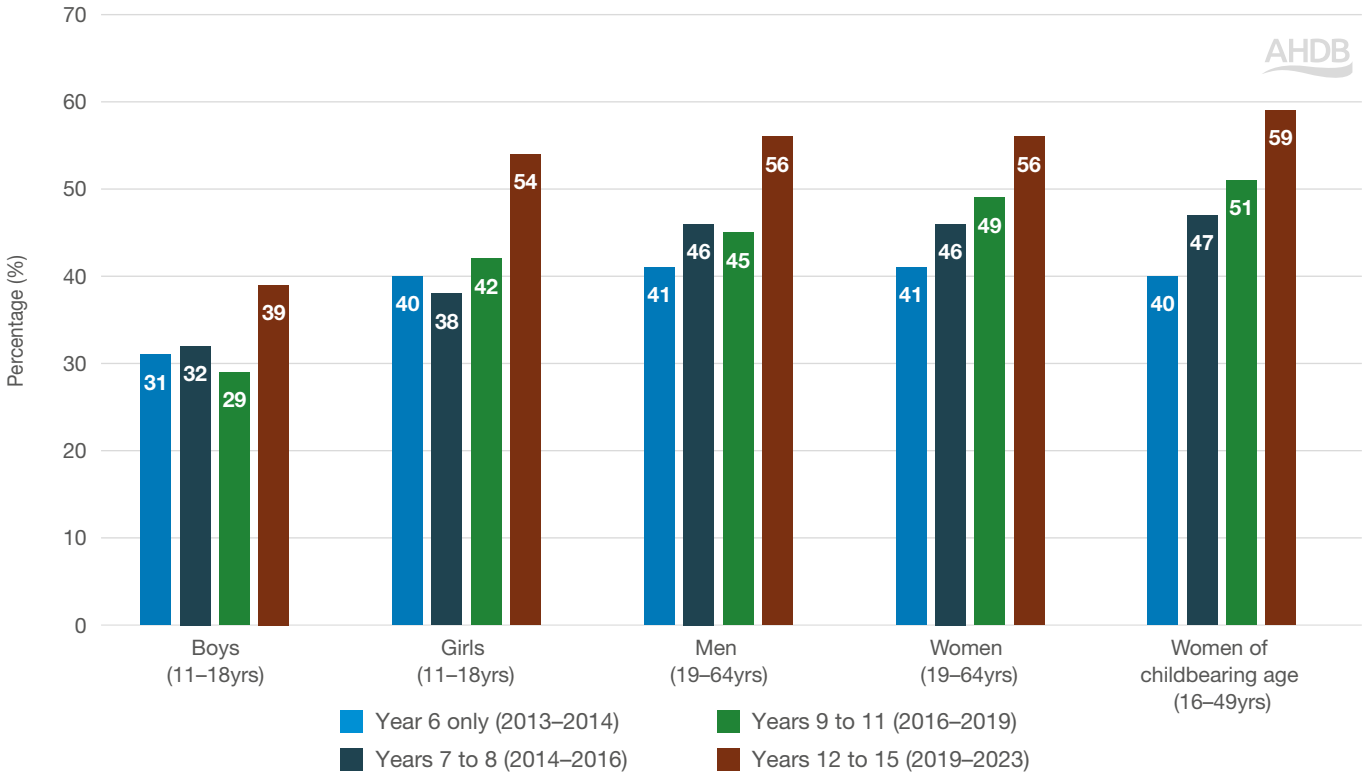


Figure 10. Percentage of adolescents and adults with insufficient iodine status (2013–2023)

Note: The figures show the percentage with median urinary iodine concentrations below 100 µg/l, which indicates inadequate iodine status. Years 9 to 11 is based on three survey years, whereas Years 7 to 8 is based on two survey years and Year 6 is based on a single survey year. Years 12 to 15 is based on four survey years. No spot urine samples were collected between April 2020 and November 2021 due to COVID restrictions. Source: NDNS data, OHID 2025[15]

Iodine intake is significantly lower in females, with 29% of girls (11–18 years) and 18% of women (19–64 years) falling below the LRNI.[15] Milk and dairy products are the main iodine sources in the UK, providing 54% of intake in children (1.5–3 years), 38% in adolescents (11–18 years) and between 34 and 44% of intakes in adults.[15]

Although nutrient composition of plant-based drinks are improving, many are not fortified with iodine. In 2023, 31% of plant-based drinks were fortified with iodine, compared with only 4% in 2020.[21]

Vitamin B2

Vitamin B2 deficiency may be underestimated in the UK due to the assumption of adequate intake.[16] However, recent evidence from high-income countries shows low vitamin B2 status and deficiency is more common than previously thought, particularly among adolescent girls and young women.[22]

NDNS blood analysis data shows high vitamin B2 deficiency rates, affecting 47% of adults over 65 and up to 76% of 11–18-year-olds.[15] Milk and dairy products are the main sources of vitamin B2 across most age groups. Although plant-based milk may seem to be nutritionally comparable to milk, a 2020 UK survey found only 29% were fortified with vitamin B2. Even when fortified, plant-based alternatives may not provide sufficient micronutrients if consumed in low quantities.[16]

Other important micronutrients

Milk and dairy provide a variety of other key nutrients and make important contributions towards intakes, for example: vitamin A, vitamin B5, phosphorus, folate, potassium, selenium, zinc and choline.

Choline: Choline supports liver function, fat metabolism and homocysteine regulation for heart health, and during pregnancy and breastfeeding, adequate intake is especially important for the baby's developing brain and nervous system.[23] Choline intake data is lacking in the UK, but the average intake for adults in different European countries is around 310 mg a day. The UK has not set recommendations for choline; however, the European Food Safety Authority sets adequate intakes at 400 mg a day for adults, 480 mg day during pregnancy and 520 mg a day when breastfeeding.[24] Meat, milk, grains, eggs and their derived products are the main dietary sources in European countries.[25]

Figure 11. Dairy's contribution to B vitamins and their role in health

How dairy supports bone health across the lifespan

Dairy supports bone health across the lifespan by:

- Helping children achieve peak bone mass
- Slowing bone loss in adults
- Reducing falls and fractures in older adults

Dairy is a key source of calcium and also provides other bone-supporting nutrients, such as protein, phosphorus, potassium, magnesium, vitamin K2 and zinc.

A healthy diet and lifestyle in early life helps individuals achieve their highest possible peak bone mass. This helps reduce the risk of osteoporosis in later life. After peak bone mass is reached in the late 20s, bone mass gradually declines, with women having a period (around 5–10 years) of rapid bone loss with the onset of menopause, when the protective effect of oestrogen is lost (see figure 13).

There is strong evidence that dairy and vitamin D support reaching peak bone mass in children and adolescents.[3,26] Nutrition is also likely to have an important impact on bone health during key life stages in adulthood, such as the menopause transition and older age, which are more prone to bone mineral loss.

Recent prospective cohort studies, particularly in women, increasingly link milk and dairy intake to reduced risk of fractures. Stronger evidence from randomised controlled trials (RCTs) also shows that dairy intake improves bone mineral density.

> “There is strong evidence that dairy and vitamin D support children and adolescents reaching peak bone mass”

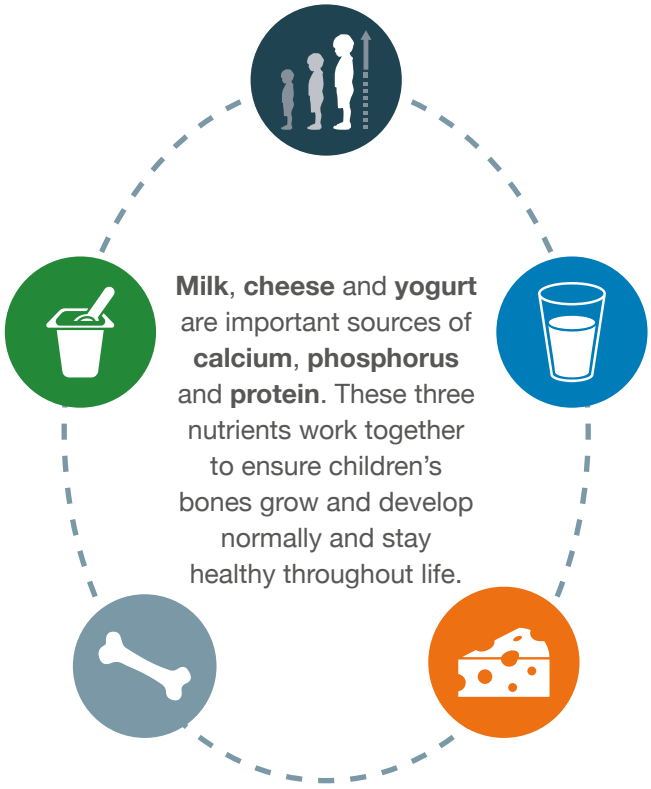


Figure 12. Dairy and bone health

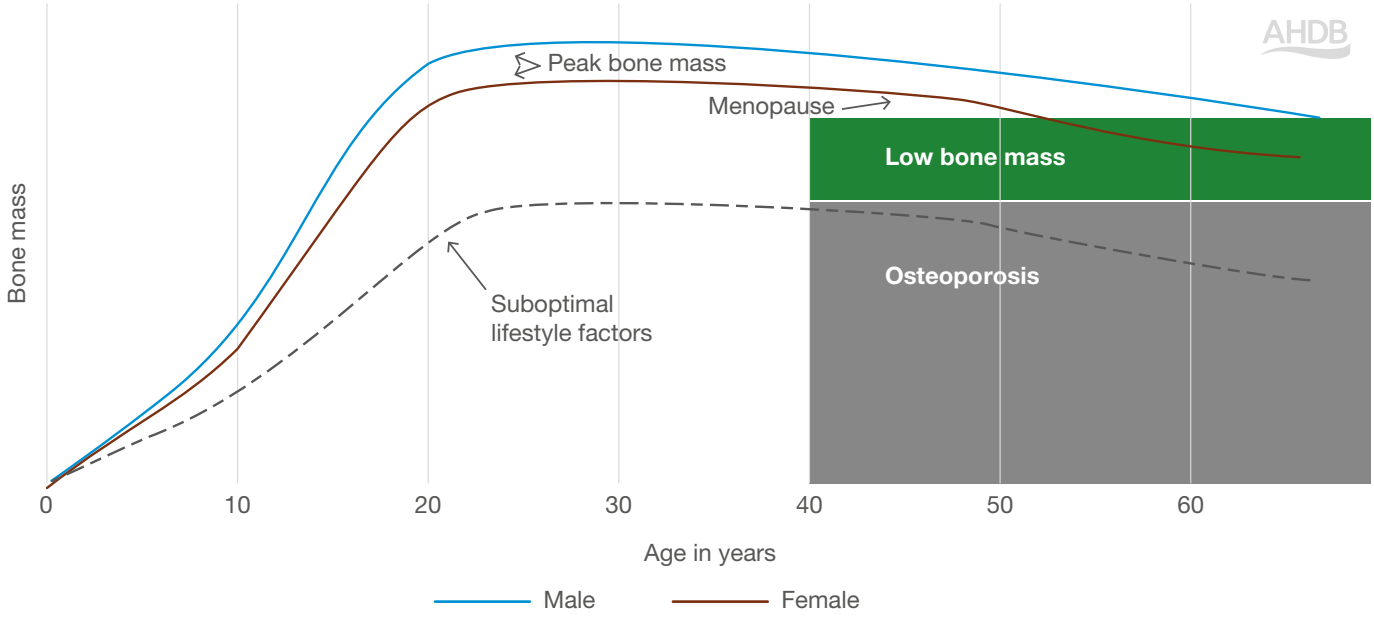


Figure 13. Bone mass across the lifespan with optimal and suboptimal lifestyle choices

Source: Adapted from Weaver et al. (2016)[26]

In a two-year RCT (n=7,195) of older adults (average age 86), results showed that increasing dairy intake to 3.5 servings a day (through additional milk, yogurt and cheese) led to a 33% reduction in all fractures, 46% in hip fractures and 11% in falls, compared with those consuming two servings daily. Notably, these benefits appeared within three to five months.[30]

> One extra daily serving of dairy reduces risk of fractures and falls in older adults

Did you know?

- Adequate calcium intake is particularly important during adolescence when bone growth is rapid: 40% of bone mass is built during this time, and 90% of bone mass is reached by age 18[27]
- In the UK, one in two women and one in five men aged over 50 will experience a fragility fracture (breaks from low-impact events like a fall from standing height)[28]
- In older adults, the osteoporosis risk is dependent on peak bone mass and the rate of bone loss overtime. A 10% increase in peak bone mass may delay the onset of osteoporosis by 13 years[29]

Dairy and cardiovascular disease (CVD)

Cardiovascular disease affects over 7.6 million people in the UK, and more than half of us will develop a heart or circulatory condition in our lifetime.[31]

Considering the food source of saturated fat.

Cereals and cereal products contribute the most to saturated fat intakes in adults (28–31%).[15] Dairy foods are often linked to CVD due to their relatively high saturated fat content, which accounts for 20–28% of adult intake.[15] However, emerging evidence challenges the recommendation to reduce saturated fat without considering its source. The dairy matrix provides nutrients and bioactive components that support cardiovascular health, and recent research indicates that overall dietary patterns are more relevant to cardiovascular health than saturated fat alone.

Dairy and cardiovascular disease (CVD) risk

Overall, evidence shows dairy is either neutral or beneficial for CVD risk, with fermented products such as yogurt and cheese showing particularly favourable effects.

Some studies report benefits irrespective of fat content, while others suggest low-fat dairy is more cardioprotective. The wide variation of different dairy products in terms of their nutrient content, structure and food matrix, which influence their metabolic effects, makes broad conclusions challenging. Also, regional dietary patterns and sex-specific cardiometabolic risk further influence dairy's impact on CVD risk. Future research should focus on specific dairy products and population sub-groups (e.g. pre- and postmenopausal women).

Recent large cohort studies suggest consuming dairy has cardiovascular benefits. The ATTICA study reported a 23% lower CVD risk with one additional dairy serving[32] and the UK Biobank study found higher dairy intake was linked to reduced CVD risk, with more than one serving a day being associated with a 7% lower CHD risk.[33]

Dairy and cholesterol: A recent review of 19 RCTs found high dairy intake (≥3 servings a day), irrespective of fat content, had no detrimental effects on total, LDL, HDL cholesterol or triglycerides, compared with a diet low in dairy.[34] Yogurt seems to improve blood lipids, possibly due to fermentation enhancing its nutritional properties and lactic acid bacteria that may support cardiovascular health.

Dairy and blood pressure: Recent RCTs show dairy intake, regardless of fat content, does not adversely affect blood pressure; and both low- and full-fat dairy can improve systolic blood pressure.[34,35] Fermented milk and yogurt seems to be particularly protective against CVD, possibly due to the probiotics and bioactive peptides that benefit the gut microbiome, helping to reduce inflammation and blood pressure.

Heart healthy dietary advice

Dairy can be part of a heart-healthy diet. Indeed, closer alignment with heart-healthy diets like the Eatwell Guide and DASH (dietary approaches to stop hypertension) diet can help reduce CVD risk. The DASH diet, designed to lower blood pressure, is a plant-rich diet that includes 2–3 servings of low-fat dairy daily and is linked to decreased CVD incidence and improved blood pressure and cholesterol levels. Diets that include low-fat dairy are well established as heart-healthy diets. However, the benefits of the DASH diet persist even when low-fat dairy is replaced with full-fat options.[36]

Health professionals can now confidently advise that dairy foods should be considered as whole foods rather than judged solely by their saturated fat content, as current evidence shows no consistent association between most dairy products and increased cardiovascular disease risk. In particular, fermented dairy foods such as yogurt and cheese appear neutral or potentially protective, likely due to the benefits of the dairy food matrix. While butter remains less favourable and should be replaced with polyunsaturated fats, moderate intakes of milk, yogurt and cheese, including full-fat versions, can fit within heart-healthy dietary patterns.

Dairy's role in supporting a healthy weight and body composition and type 2 diabetes (T2D)

Two-thirds of adults in the UK are above a healthy weight, and up to a third live with obesity.[37] Data shows that one in three children in England leave primary school overweight or obese, with one in five living with obesity.[38] An estimated 12.1 million people in the UK are affected by diabetes or prediabetes,[39] and concerningly, rates of T2D are rising among young adults (under 40) and children, largely driven by obesity.

Weight and body composition

Milk and dairy are often perceived to be high-calorie foods, leading to dietary recommendations for reduced- or low-fat dairy options to help support healthy weight control. However, growing evidence suggests milk and dairy products may in fact have a beneficial role in weight management.

Children and teenagers: Evidence suggests that milk, regardless of the fat content, is not linked to increased body fat, and consuming whole milk may reduce obesity risk in children. Findings from the Milky Way Study (a RCT with 49 children) reported no evidence of different effects of whole-fat compared with reduced-fat dairy on body fat.[40]

Adults: Observational studies generally report neutral or protective effects with dairy intake and body weight. An analysis of five cohort studies found that each additional 200 g/day intake of dairy was linked to a 25% lower risk of becoming overweight or obese.[41] Similarly, analysis of US dietary survey data found whole milk intake was associated with lower body weight, BMI, waist circumference and obesity prevalence.[42]

Evidence suggests dairy may promote a healthier body composition. An analysis of 37 short-term RCTs reported that a higher intake of dairy, in an energy-restricted diet, led to decreased weight, waist circumference and body fat, along with increased lean mass. With growing use of GLP-1 weight loss medications, dairy foods such as milk, yogurt and

cheese may help preserve lean body mass and provide a nutrient-dense, affordable option for those with suppressed appetite.

Type 2 diabetes (T2D)

Overall, evidence suggests dairy, particularly moderate intakes of low-fat dairy and yogurt, may help reduce T2D risk. The nutrients in dairy, such as calcium, vitamin D, proteins and probiotics, are suggested to contribute to these beneficial effects by supporting glucose metabolism, regulating post-meal blood sugar levels and improving insulin sensitivity.[44]

Milk and yogurt tend to show favourable effects on metabolic syndrome, while findings on cheese are mixed, though generally neutral or modestly protective against T2D risk. Interestingly, the impact of dairy intake on T2D risk may differ for men and women, possibly due to differences in hormones or fat distribution.

Evidence from RCTs support findings from observational studies that dairy may help prevent T2D, particularly in those at risk.[45] A meta-analysis of 30 trials showed low-fat dairy improved body weight, waist circumference and insulin sensitivity.[45]

Fermented dairy's benefits

Fermented dairy, specifically high-fat yogurt, appears most effective in reducing the risk of becoming overweight or obese. These protective effects may reflect greater nutrient bioavailability (e.g. calcium), compared with other dairy products,[41] as well as slower gastric emptying and appetite-suppressing properties.

Yogurt also appears particularly beneficial for reducing T2D risk, possibly due to its probiotics and bioactive compounds that support gut health and improve insulin sensitivity. However, these favourable effects could also partly reflect healthier lifestyles of yogurt consumers.

Recent nutrition guidance supporting GLP-1 therapy for obesity highlights dairy as a dietary factor to help maintain nutritional health.[43]

Current evidence on dairy and cancer

Since 1997, the World Cancer Research Fund (WCRF) and the American Institute for Cancer Research (AICR) have published evidence reviews every 10 years on how diet and nutrition affect cancer risk. The latest, the Third Expert Report (2018),[46] presents global cancer prevention recommendations from the Continuous Update Project (CUP), focusing on diet, nutrition and physical activity for cancer prevention and survival.

While more research is needed to better understand the impact of different types of dairy on colorectal cancer (CRC) risk, current evidence suggests that consumption of dairy foods, especially low-fat milk, cheese and yogurt, may be protective against CRC.

Colorectal cancer (CRC)

The WCRF reported strong evidence that consumption of dairy products helps protect against colorectal cancer.[46] Dairy's protective effect against CRC is mainly thought to be attributed to calcium intake,

as calcium binds to bile and free fatty acids in the colon, reducing their potentially carcinogenic effects.[47] Of the 14 studies included in the systematic review, a dose-response meta-analysis of 10 studies showed a 13% lower risk of CRC per 400 g daily increase in dairy product consumption.

Breast cancer

Dairy intake, especially milk, may be protective against breast cancer risk. Low-fat dairy appears protective for pre-menopausal women, while fermented dairy may benefit post-menopausal women.

The WCRF[48] reported "limited-suggestive" evidence that women who consume dairy and high-calcium diets may reduce pre- and post-menopausal breast cancer risk. Each 200 g a day increase in dairy intake was found to reduce the risk of pre-menopausal breast cancer by 5%.[48] Further research is needed to clarify how different dairy products affect the risk of breast cancer sub-types across various age groups and menopausal stages.

Prostate cancer

Evidence indicates that milk and dairy consumption may be linked to increased prostate cancer risk. A dose response meta-analysis of 15 studies showed a 7% increased risk per 400 g of dairy per day.[49]

WCRF reported "limited-suggestive" evidence that consumption of dairy products may increase the risk of prostate cancer.[46] Although this evidence is limited, men at high risk of prostate cancer are advised to moderate calcium intake from dairy sources.

Dietary and lifestyle patterns

WCRF International's 2025 report, "Dietary and lifestyle patterns for cancer prevention", emphasises that overall dietary and lifestyle patterns, rather than individual foods or nutrients, better reflect "real life" habits and offer clearer guidance for preventing breast and colorectal cancer.[50] Based on an analysis of 86 studies, this WCRF report recommends including calcium-rich foods, such as dairy products, for CRC prevention. Unlike the 2018 guidelines, which excluded dairy and calcium, due to limited evidence and prostate cancer concerns, current evidence now supports its inclusion in dietary and lifestyle recommendations for CRC prevention.[50]

Most dietary patterns in the CUP Global reviews did not distinguish between high- and low-fat dairy, though both appear similarly protective against CRC, mainly due to its high calcium content. The WCRF advises against using supplements for cancer prevention, recommending calcium from food and drinks instead.[50]

Environmental sustainability of UK dairy

Environmental sustainability is about more than reducing emissions alone. Making better use of natural resources, reducing waste, supporting nature recovery and, critically, removing carbon from the atmosphere and storing it in our soils, trees and other biomass is crucial for supporting the UK's net zero ambitions. Agriculture is unique in that it has great influence on all these actions.

Considering both sides of the net zero equation

Livestock farming is both a source of greenhouse gas emissions and a provider of carbon sequestration and storage.

Net zero is defined as where any greenhouse gas (GHG) emissions are reduced as much as possible, with any remaining emissions balanced by activities that permanently remove the same amount from the atmosphere.

Greenhouse gas (GHG) emissions

UK agriculture is the fifth-largest contributor to GHG emissions, accounting for around 12% direct emissions, with approximately 7% of this from livestock.[51] Emissions intensity from UK milk production has fallen by 22% since 1990,[52] with milk production accounting for 2.8% of total UK GHG emissions.

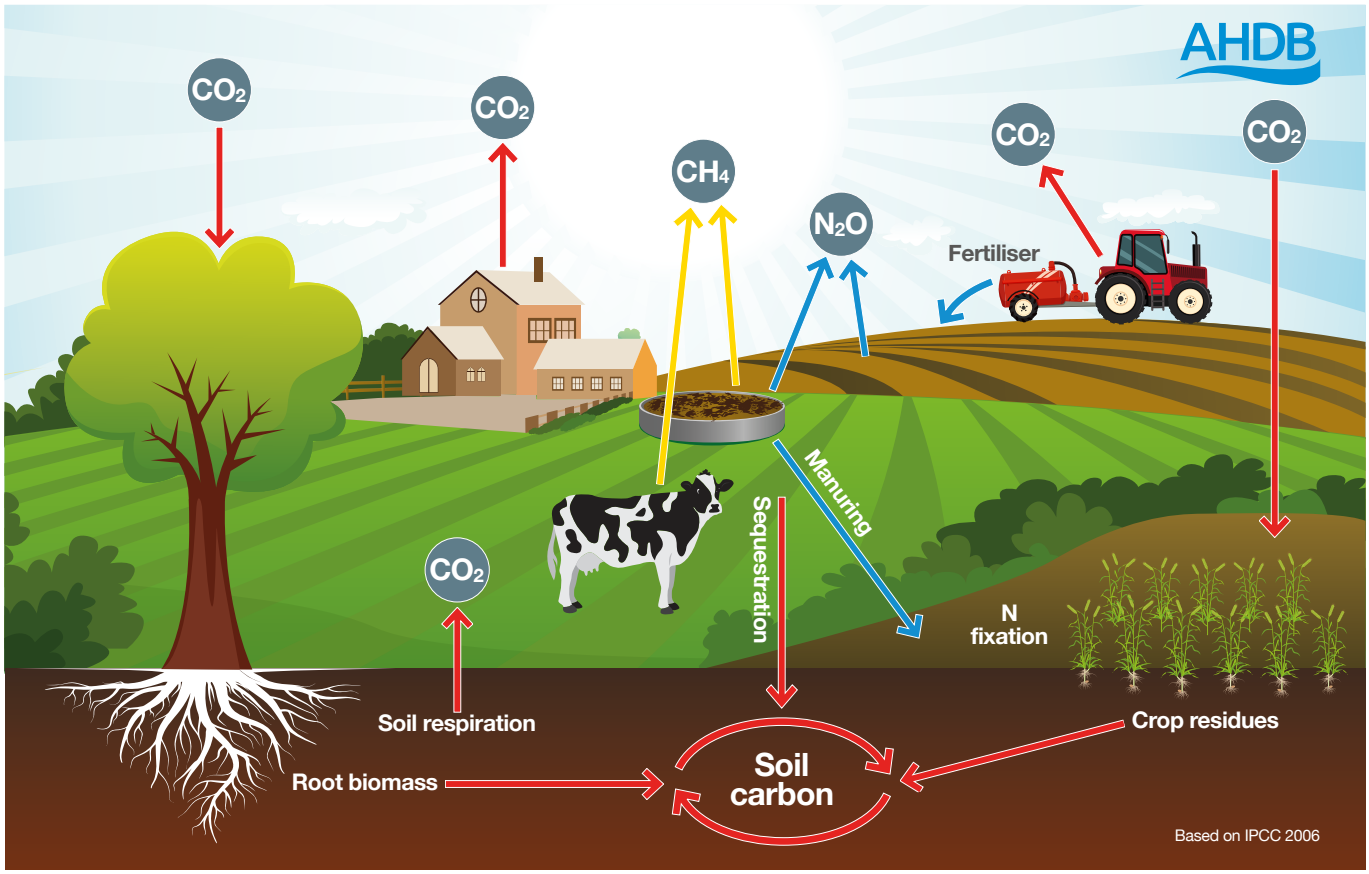


Figure 14. Determining carbon balance (net zero GHG emissions) by analysing how agriculture interacts with the whole environment, including carbon removal and nature recovery

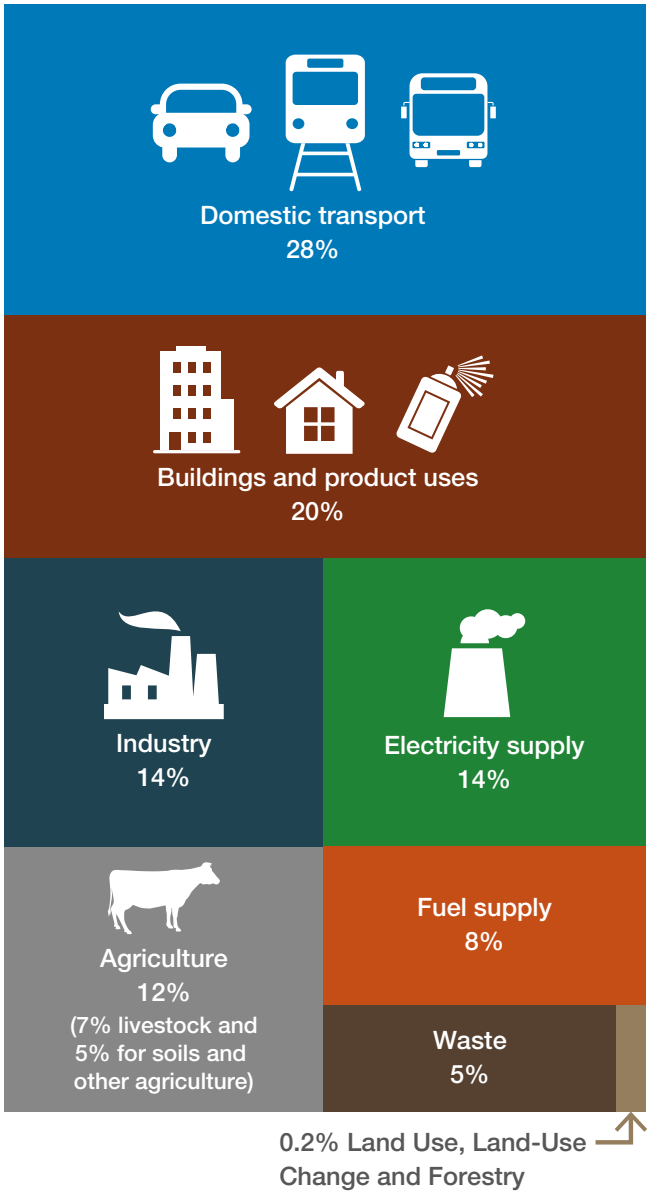


Figure 15. UK Greenhouse Gas Emissions (2023) by sector source[51]

Accurate measurement of environmental impact

The UK dairy sector's emissions are often compared with global averages, but this can be misleading. More localised assessments are needed that acknowledge the variations between farming systems in different countries. These variations include genetics, animal health, nutrition, grazing and the use of other natural resources (such as water).

UK dairy farms have the potential to play a key role in the UK's net zero journey if carbon sequestration is better understood and accounted for. More granular data is needed to provide better evidence of this and to continue to drive progress. AHDB is leading a pilot which will create a carbon baseline to improve understanding of the carbon position of British farms.

Managing natural resources and the environment

Dairy cows require large volumes of water daily to maintain health and productivity. Most water (around 99%)[53] for dairy farms comes from rainfall rather than mains supply, with farmers actively managing the water they use on farm and minimising its wastage.

UK farmers are adopting innovative land management practices, such as integrating trees and shrubs with grazing; this form of agroforestry enables farmland to increase tree cover and farm livestock, with some farms utilising the trees for fodder where appropriate.

Dairy farms house a series of interconnected ecosystems that can offer invaluable habitats for maintaining and enhancing nature. Grazing animals may also play a key role in maintaining the diversity of soil communities.

Dairy cows play a valuable role in the circular economy by consuming plant-based food waste and supply chain co-products that would otherwise go unused; these include by-products from human food production, such as brewers' grains, bakery waste, citrus pulp and distillers' grains. For every 1 kg of plant-based food produced, an estImated 3–5 kg of inedible crop material is generated. Dairy cows convert this material into milk and meat, reducing food system waste and improving resource efficiency.[54]

Anaerobic digestion (AD) is a natural process that converts organic materials (like manure) into biogas – a methane-rich gas that can be used as a renewable fuel. AD captures methane that would otherwise escape from manure stores and produces usable energy (biogas) that can replace fossil fuels.

Making the best use of the land available

Dairy cow diets in the UK are primarily forage-based, with grass and grass silage forming the main components, with any concentrates fed making up a smaller proportion of the diet and being adjusted depending on the season and the cow's needs.

As of 2024, despite 69% of UK countryside being farmland, 56% of this is permanent grassland,[55] which is often unsuitable for growing any crop other than grass. Converting existing grassland to arable land is not a straightforward solution, taking into account soil quality, topography and untended consequences, such as the release of carbon.

Therefore, utilising this land for livestock production optimises productivity, enabling ruminants to convert inedible grass into nutritious food humans can consume. Beef from the dairy herd is playing an increasingly important role in maintaining the UK's domestic beef supply. From a sustainability perspective, British beef, particularly from the dairy herd, is among the most environmentally efficient in the world.

Animal health and welfare

There is a distinct correlation between maintaining high animal health and welfare and the reduction of carbon emissions, due to the impact of productivity, with optimal animal health being a key driver in sustainable livestock systems.

Britain's dairy farms are widely recognised for proactive animal health and welfare practices. Robust farm assurance schemes, such as Red Tractor and RSPCA Assured, underpin these high standards, requiring farmers to maintain comprehensive herd health plans and exceeding baseline legal welfare requirements.

What's Next?

The UK dairy sector remains committed to producing nutrient-dense food for a growing global population while maintaining and enhancing the natural environment.

UK Dairy Roadmap

The UK Dairy Roadmap is a cross-industry initiative, launched in 2008, to drive environmental sustainability across the dairy supply chain. In 2025, its collaboration was expanded to bring together the full dairy value chain, bringing foodservice, wholesale and retailers together with farmers and processors under a single governance structure. A key output will be the Sustainable Dairy Pathways Report, due in 2026, which will identify the innovations and funding needed to meet net zero and other environmental goals.[56]

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