



DIETARY DEFICITS AND FUTURE HEALTH AND WELLNESS FALLOUTS



FOREWORD

Britain's haphazard approach to diet and nutrition is leaving millions of people short of key nutrients. As a result of the multiple dietary deficits, many people are undermining their everyday wellbeing and putting their future health at risk.

Real-world data¹ commissioned by the Health and Food Supplements Information Service (HSIS; www.hsis.org) reveals that 93% of adults acknowledge² their dietary choices could be healthier. This data also exposes major gaps in consumer awareness of the vital role that specific nutrients play in supporting physical and mental wellbeing.³

HSIS researchers have also raised the alarm in a paper published in the journal *Food and Nutrition Sciences*, which used data from the latest National Diet and Nutrition Survey (NDNS)⁴ to identify and track shortfalls of vitamins, minerals and omega-3 fatty acids.

The HSIS authors warned, "If nutrient levels remain below recommended levels, our future health and wellness could be at risk." They have called for public health interventions to increase nutrition literacy and improve the nation's diet.

The HSIS authors cautioned, "If such nutrition policies are not implemented, along with fairer costs for healthy foods, the NHS is likely to experience greater strains, resulting in higher costs from treating the health consequences of poor-quality diets."

“ IF NUTRIENT LEVELS CONTINUE TO BE POOR... **THE FUTURE HEALTH AND WELLNESS OF THE NATION COULD BE AT RISK** ”

The need for a joined-up strategy to improve the nation's nutrition is underlined by the latest HSIS consumer data, which shows that 73% of adults are concerned they may not be getting all the nutrients they need from their diet, while 85% suspect their diet could be missing key nutrients.

Dr Emma Derbyshire, a public health nutritionist from HSIS and one of the authors of the Food and Nutrition Sciences paper, says, "Consumers are right to be concerned. NDNS data and real-world research consistently highlight worrying shortfalls of many important nutrients.

"Any nutrient gap is of concern because it impacts on wellbeing, but the widespread shortfalls we have identified in the NDNS and HSIS consumer data suggest that many individuals are likely to have multiple nutrient gaps."

Practising NHS GP, Dr Nisa Aslam, who is an adviser to HSIS, explains further, "This latest research data is very worrying as we know that absorption of one nutrient is often dependent on having adequate levels of another. For instance, vitamin D promotes calcium absorption,⁵ magnesium activates absorption of vitamin D,⁶ and vitamin C increases the uptake of iron.⁷

"This means that any single nutrient shortfall could have a knock-on effect on our ability to absorb and utilise other nutrients. Multiple nutrient gaps could set the scene for an accumulation of various health issues due to sub-optimal intakes."

Pharmacist Noel Wicks, another expert at HSIS, says, "Self-care is so important now for many areas of healthcare, and nutrition is no different. In fact, as a healthy diet is one of the fundamentals for physical and mental wellbeing, it should be a high priority.

"However, we all know that even with the best of intentions, it can be a challenge to eat at least five portions of fruit and vegetables every day, as well as getting the right mix of proteins, grains and healthy fats our bodies need.



“THE SITUATION IS UNLIKELY TO CHANGE WITHOUT A **MAJOR SHIFT IN PUBLIC HEALTH POLICIES AROUND FOOD**”

"Busy lifestyles, rising food prices, easy access to calorie-heavy but nutrient-light ultra-processed foods, and eating regimes which exclude entire food groups are just a few of the barriers to better eating."

"When it comes to vitamin D, during the long winter months, it is impossible to produce enough vitamin D from sunlight alone and with so few foods being a rich source of vitamin D, to maintain adequate blood levels, taking a top-up vitamin D supplement is advised by the NHS. As a result, the government's public health official advice is for everyone in the UK to take a supplement containing 10 micrograms of vitamin D from October to March, when the sunshine is scarce."

It's also clear that despite the incessant 'noise' around nutrition and the plethora of advice on social media and other platforms, many consumers are still uncertain about what foods they should be eating to ensure their nutrient intakes.

Dietitian and HSIS adviser, Dr Carrie Ruxton, says, "We've had decades of public health messaging around eating five a day for fruits

and vegetables and reducing our intakes of saturated fats and refined sugar. Warnings about so-called 'junk food' have morphed into warnings about ultra-processed foods — and yet our diets continue to deteriorate."

This report from HSIS maps the depth of the UK's dietary deficiencies, the myriad factors which are undermining our nutritional status and the health and wellbeing implications, which mean this is an issue we must address urgently.

Dr Carrie Ruxton adds, "The situation is unlikely to change without a major shift in public health policies around food, improved education about the importance of nutrition and strategies to make healthier choices more accessible and affordable in all corners of the UK.

"Until then, the onus will be on individual action and self-care. As a result, when it comes to nutrition, a simple strategy to bridge the dietary gaps that can limit health and wellbeing problems is to take a multivitamin and multimineral supplement, alongside an omega-3 supplement if you are not following the official advice to eat two portions of fish a week, including one oily fish."



1 THE NATION'S NUTRITION

Data from the National Diet and Nutrition Survey (NDNS) and HSIS real-world research, which looked at consumer attitudes and concerns around nutritional intakes, paints a bleak picture of multiple and ingrained gaps in both our diet and our dietary knowledge.

The recent HSIS Food and Nutrition Sciences paper, co-author Dr Nisa Aslam warned, "We are continuing to see a demise in public health nutrition, with poor consumption levels of vitamin D and calcium (especially for those 11 to 18 years), iron, folate, and iodine dietary levels (particularly amongst girls and women), alongside selenium and potassium intakes (ages 11 years+) and low oily fish consumption.

"For the future, if nutrient levels continue to be poor and below the recommended levels, the future health and wellness of the nation will be at serious risk and we will start to see the return of certain diseases from previous centuries."

This echoes the HSIS consumer data⁸ which reveals:

- 93% of adults admitted their food choices could be healthier, with women more likely to acknowledge gaps, 94% compared to 92% of men.
- Older adults were also significantly more likely to believe they were eating well, with 84% of over-65s and 87% of 55 to 64-year-olds reporting they could be making healthier choices, compared to 97% of 35 to 44-year-olds and 95% of those aged 25 to 34.

“WE ARE CONTINUING TO SEE A DEMISE IN PUBLIC HEALTH NUTRITION”

2

WHY NUTRIENT INTAKES MATTER

85%⁹ reported they had concerns about nutrient gaps at some time, with 47% reporting this was a worry 'often', or 'all of the time'. There was also a clear demographic trend with younger adults significantly more likely to report that this was often or always a concern: 59% of 18 to 24-year-olds, 60% of those aged 25 to 34 and 56% of 35 to 44-year-olds - compared to only 37% of those aged 45 to 54, 24% of 55 to 64-year-olds and just 17% of the over-65s.

Overall, only 7% had no concerns about nutrient gaps, but again, there was a stark age divide, with only 2% of 18 to 34-year-olds confident they were not missing any nutrients compared to 25% of over-65s.¹⁰

When asked to rate their diet, the average score given was 6.8 out of 10, with men reporting they ate more healthily, scoring themselves 7 out of 10 compared to an average of 6.5 for women.

- Adults aged 25 to 34-year-olds gave themselves the highest score; 7.2, compared to just 6.3 for 18 to 24-year-olds.
- Over-65s scored their diet 7 out of 10, while working-age adults scored their intake 6.5.¹¹

Curiously, vegans gave themselves the highest score, 7.5, despite the well-documented challenges around hitting nutrient targets from an entirely plant-based diet. As you would expect, those who took a vitamin and mineral supplement had a score of 7, compared to 6.2 for those who did not top up on key nutrients through supplementation.¹²



This consumer research did not include children's nutritional status, but this was explored in the HSIS analysis of the NDNS data from the recent Food and Nutrition Sciences paper. The findings highlight a scant improvement in the vitamin and mineral intakes of children aged between 18 months and 10 years in almost two decades.

Similarly, there have been minimal improvements in the nutritional status of children aged 11 to 18 years, and by some measures, including the percentage of children failing to achieve the Lower Reference Nutrient Intake (LRNI) for riboflavin, calcium and potassium, the NDNS data show a deterioration since the 2008 to 2010 survey.

Four out of five consumers recognise that what they eat has a huge (36%) or a lot (44%) of impact on their health, and they are right.

The World Health Organization (WHO) is unequivocal: "A healthy diet is a foundation for health, well-being, optimal growth and development."¹³ WHO also states, "Diet plays a critical role in shaping the health and well-being of both individuals and populations, and unhealthy diets are a major risk factor for disease and disability."¹⁴

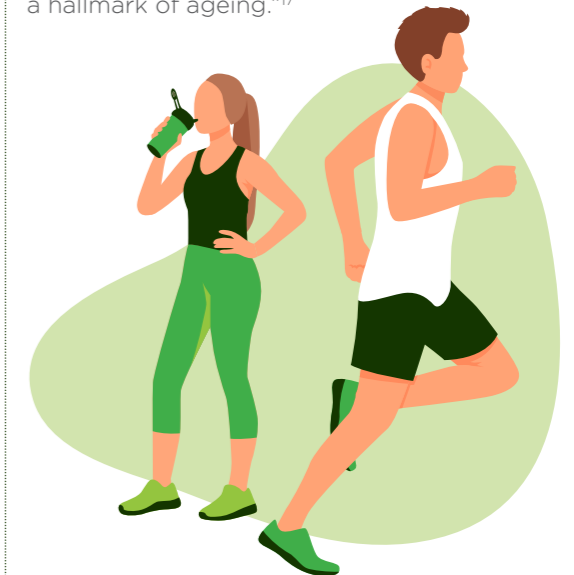
Closer to home, the NHS advises, "Eating a healthy, balanced diet is an important part of maintaining good health, and can help you feel your best."

A recent study, which analysed information from 103,649 people from the UK Biobank dataset, found that a healthy diet will add an average of three years to the lifespan of a 45-year-old man and 2.3 years to a woman's - regardless of their genetic risk of early death.¹⁵

Similarly, a large US study reported that people who ate a healthy, nutrient-rich diet in their mid-life were more likely to live into their 70s without developing a major chronic disease.¹⁶ Dr Carrie Ruxton says, "These studies looked at diets generally, but more detailed

analysis confirms that nutrient intakes are a major factor in health and longevity.

"A large American study found that people who achieve, or exceed, the recommended intakes of 10 micronutrients - vitamins A, C, D, E, calcium, magnesium, potassium, folate, zinc and iodine - reduced their risk of having multiple chronic conditions, which are often a hallmark of ageing."¹⁷



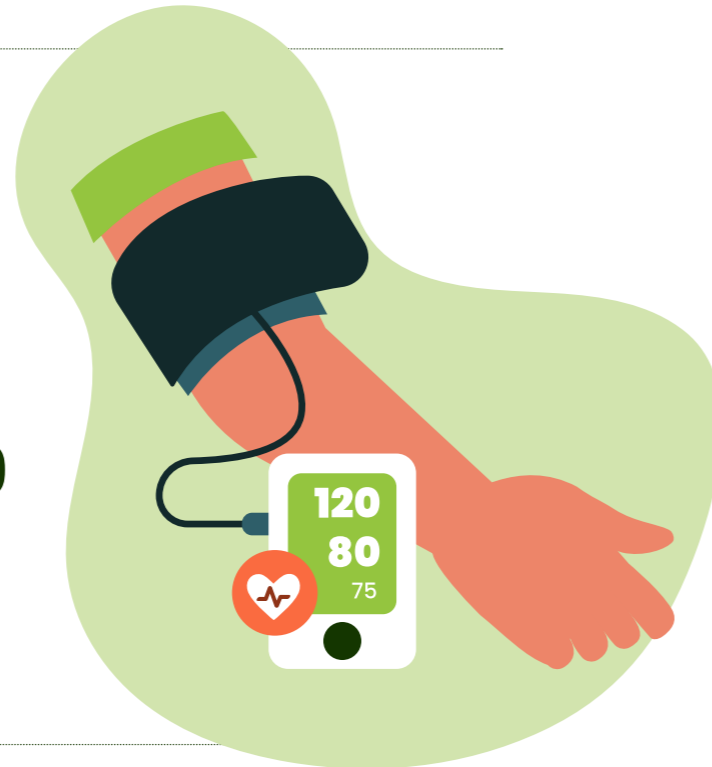
Another found that, compared to adults with good intakes of vitamin E, magnesium and fibre, those with inadequate amounts were 'significantly' more likely to die from any cause, and were at higher risk of cardiovascular disease.¹⁸

However, the authors caution this "could not be attributed to individual nutrients, but the interactions of multiple nutrients" and they concluded, "Nutrient intervention is a pivotal component in the prevention and management of cardiovascular disease, with its significance becoming increasingly indispensable."

Dr Emma Derbyshire explains further, "There is increasing focus on this interaction between different nutrients, and it highlights the importance of protecting against any and all nutrient gaps. We know from the NDNS data that shortfalls are an issue for far too many people, and consumer data confirms that the importance of many nutrients and micronutrients is often underestimated."

Type 2 diabetes and heart disease are the conditions consumers most likely associate with poor food choices - 67% and 62% respectively - and it's widely acknowledged that nutrition influences our risk of both of these common diseases.¹⁹

INADEQUATE INTAKES OF POTASSIUM, MAGNESIUM AND OMEGA-3 FATTY ACIDS ARE **LINKED TO HIGH CHOLESTEROL AND RAISED BLOOD PRESSURE**



Inadequate intakes of potassium, magnesium and omega-3 fatty acids are linked to high cholesterol and raised blood pressure - two major contributors to cardiovascular disease (CVD). And there is growing interest in the role that vitamin D and calcium play in vascular health.²⁰ A study published last year, which considered 56 nutrients, found that eight - including three forms of omega-3 - play a significant role in lowering cardiovascular risk.²¹

The authors noted that a higher intake of both fat- and water-soluble vitamins "Was associated with a reduced risk of CVD after multiple comparison adjustments, suggesting potential protective effects". And they pointed out interactions between fat-soluble vitamins and unsaturated fatty acids "suggested a potential synergistic effect in reducing CVD risk".

Dr Nisa Aslam continues, "Another area of increasing interest to researchers is the role the microbiome plays in modulating our wellbeing and risk of disease. Scientists at King's College London, who are at the forefront of this work, have found clear links between the microbiome and health, including a reduction in the risk of heart disease, type 2 diabetes and obesity.²²

"It's also very likely that many of the health challenges now associated with ultra-processed foods are a result of the negative impact they have on our gut microbiome and ability to absorb micronutrients."²³



According to the journal *Frontiers in Microbiology*, "Different dietary patterns can significantly alter the abundance and diversity of gut bacteria, leading to various health outcomes. The gut microbiome plays a crucial role in nutrient absorption, immune function, and metabolic processes."²⁴

In the next section (section 3) of this report we look at nutritional shortfalls and what the health and wellness fallout is as a result of nutrient deficiencies.



3 NUTRITIONAL SHORTFALLS AND FALLOUT

HSIS real-world research confirms that the conditions consumers are most likely to associate with their food choices are type 2 diabetes (67%) and heart disease (62%),²⁵ and there is universal agreement that diet quality plays a part in both of these common killers.

FACT: One study found that a healthy diet and exercise reduced the risk of diabetes by as much as 31%²⁶ and CVD by 30%.²⁷

Diabetes is one of the most common chronic diseases in the UK. Around 4.6 million people have been diagnosed and it's estimated that another 1.3 million have type 2 diabetes but don't realise it.²⁸ The condition contributes to the deaths of more than 27,000 people a year in the UK - around one in 10 adults aged 20 to 79.²⁹

Cardiovascular disease (CVD) is an even bigger health challenge, with more than eight million people in the UK living with the condition and around 168,000 people a year dying from some form of CVD.³⁰

Pharmacist Noel Wicks says, "The very large numbers of people affected by diabetes and cardiovascular disease mean that even relatively small tweaks to risk known factors, such as poor diet and nutrition, could deliver massive health benefits at a population level. This would also have a huge impact in terms of reducing pressure on the NHS."

“DIABETES IS ONE OF THE MOST COMMON CHRONIC DISEASES IN THE UK. **AROUND 4.6 MILLION PEOPLE HAVE BEEN DIAGNOSED**”



However, given the multiple nutrient gaps exposed by the NDNS and HSIS consumer data, it's likely that improving our nutrient status would have a much wider impact on our physical and mental health, as many of the consumers surveyed had signs of a potential nutrient shortfall. These included³¹:

● Tiredness	49%
● Low energy levels	41%
● Sleeplessness	34%
● Low mood	30%
● Fatigue	29%
● Stress or anxiety	26%
● Depression	22%
● Headaches	19%
● Poor mental health	14%
● Bloating or stomach cramps	13%

Dr Nisa Aslam adds, "Some of these symptoms, such as tiredness and fatigue, will be widely recognised as signs of a potential nutrient deficiency - most likely iron - which we know is an issue for many women of childbearing age. Similarly, there is reasonably

widespread awareness that mood is influenced by B vitamins as well as omega-3 fats.

"But I know from talking to patients that many don't realise the wide range of different symptoms and health challenges which may be rooted in a nutritional shortfall. For instance, while many know that stress and dehydration can trigger headaches, far fewer are aware that B vitamins can also play a part.³²

"In fact, research has found such a strong correlation between migraines and shortfalls of vitamins B1, B6, B9 and B12 that experts have suggested that those who suffer from chronic headaches or migraines should be included in the diagnostic marker testing for vitamin B12 deficiency."^{33,34}

Pharmacist Noel Wicks notes further, "Far too many consumers have only a minimal understanding of the importance of nutrients for good health. The Government, health regulators and the health and food sector need to do more to raise awareness of the wide range of health issues and problems that can be caused by inadequate intakes - particularly as it is so easy to plug these gaps with an inexpensive multivitamin and multimineral supplement."

“THERE IS REASONABLY WIDESPREAD AWARENESS THAT **MOOD IS INFLUENCED BY B VITAMINS AS WELL AS OMEGA-3 FATS**”



4

BARRIERS TO
BETTER DIETS

So why are so many people falling short of the recommended intakes of many nutrients - particularly when we are surrounded by so much messaging around diets and health? The HSIS Food and Nutrition Sciences paper suggests that nutrition noise could be a part of the problem.

The authors note, “There has been much interest in plant-based diets and ultra-processed foods recently, yet much greater emphasis needs to be placed on the fundamentals, such as the nutrient density of foods and the importance of attaining dietary benchmarks.”

Dr Carrie Ruxton says, “We seem to have slipped into a scenario where many consumers can’t see the wood for the trees when it comes to nutrition. There is a lot to be said for going back to basics and focusing on the nutrient content of our diets, rather than getting hung up on the latest eating trends or avoiding particular food groups.”

“Overly simplistic mantras, such as ‘avoid ultra-processed foods’, are unhelpful and mean that some consumers might be put off inexpensive and healthier processed options - such as baked beans, soya milk, cooking sauces or fortified breakfast cereals.”

She says, “The latest HSIS real-world data shows that one in 20 adults is now vegan (5%), another 4% are vegetarians who eat

eggs and dairy products, and another 6% are pescatarian.³⁵ This means that 15% - one in seven adults - are avoiding red meat, which is our most readily absorbed source of iron and zinc.”³⁶

“THERE IS A LOT TO BE SAID FOR GOING BACK TO BASICS AND FOCUSING ON THE NUTRIENT CONTENT OF OUR DIETS”





Dr Nisa Aslam adds, "There are undoubtedly several benefits to eating a plant-based diet, but it takes a certain degree of knowledge to ensure adequate intakes of iron - which we know is a challenge for many adolescent girls and women."

One recent study reported, "Intake and status of vitamin B12, vitamin D, iron, zinc, iodine, calcium and bone turnover markers were generally lower in plant-based dietary patterns compared to meat-eaters. Vegans had the lowest vitamin B12, calcium and iodine intake, and also lower iodine status and lower bone mineral density."³⁷

It's also clear that many consumers struggle to achieve even basic nutrient targets.

- Only three in five adults (61%) try to eat the recommended five-a-day fruit and vegetables - which means that two in five are not even attempting to achieve this minimum intake.
- Similarly, only 30% try to eat fish twice a week, with most sticking with white fish rather than including a weekly serving of omega-3 rich oily fish.
- Just 26% of respondents opt for wholegrain versions of bread, rice and pasta where possible.
- Only a quarter make the effort to limit ultra-processed foods (24%) and saturated fats (24%).³⁸

Cost is also a factor, with a third of consumers (34%) reporting that healthy foods are too expensive³⁹ and two-thirds (61%) saying the cost-of-living crisis has impacted their food choices.⁴⁰

In the next section of this report, we review in full the nutrient gaps and what this could mean for people's health and wellness in the short and long term.

“COST IS ALSO A FACTOR, WITH A THIRD OF CONSUMERS (34%) REPORTING THAT **HEALTHY FOODS ARE TOO EXPENSIVE**”





5

HONEYCOMB PATTERN OF VITAMIN AND MINERAL GAPS

AND THE WELLBEING CHALLENGES OF NUTRIENT DEFICIENCIES

The HSIS Food and Nutrition Sciences paper and consumer data reveal a worrying honeycomb pattern of nutrient gaps and shortfalls. Public health nutritionist Dr Emma Derbyshire says, “Each vitamin and mineral shortfall is problematic in itself, but it’s the pattern of multiple gaps that is particularly worrying.

“These will, inevitably, mean that many people are at risk of sub-optimal functioning and performance on a day-to-day basis, and may well be showing signs of insufficiency - even if they don’t recognise the link between their nutrient status and common niggles such as fatigue, brain fog, low mood, brittle nails or dry skin and hair.”



KNOW YOUR NUTRIENT INTAKES

Reference Nutrient Intakes (RNI) and Lower Reference Nutrient Intakes (LRNI) are the official terms used to assess nutrient intakes.

The RNI represents the amount of a nutrient that is enough to ensure that the needs of most of a particular demographic group (97.5%) are being met. This varies with age and sex.

The LRNI is the amount of a nutrient that is sufficient for only a small number of people in a group who have low requirements (2.5%) - in other words - some people can get by on this amount, but most people need more than the LRNI to support good health.⁴¹

Dr Emma Derbyshire says, “This distinction is important. LRNI is widely used in research studies, published papers and guidance around nutrition, but the reality is that this bar is too low for 97.5% of the population. It is the RNI which gives a more useful guide to nutrient status.”

What Vitamins And Minerals Are We Short Of And What Does Nutrient Deficiency Mean To People's Health And Wellness?

Vitamin A

Vitamin A supports the immune system, vision in dim light and keeps the skin and nasal lining healthy.⁴² Signs of a deficiency include:

- Poor night vision
- Dry, scaly and/or itchy skin
- Infertility
- Increased susceptibility to respiratory tract infections.⁴³

The new HSIS consumer data shows that 5% of adults have poor night vision and 8% have skin issues, which could indicate a shortfall.⁴⁴



B vitamins

B vitamins are catalysts for many important enzyme-based processes in our bodies. As one study put it, they “support every aspect of cellular physiological functioning, including major functions within the brain and nervous system.”⁴⁵ Good sources of specific B vitamins include fortified breakfast cereals, animal proteins and green leafy vegetables.⁴⁶

Children are the most likely to have shortfalls, with 23% of those aged 11 to 18 years having riboflavin (B2) intakes below the LRNI. One in seven adults (15%) aged 19 to 64 also consume less than the LRNI.

Only one in five consumers (19%) are confident they know what foods provide B vitamins. Looking at specific B vitamins, only 24% know what foods provide B12⁴⁷ - which becomes increasingly difficult to absorb as we get older.⁴⁸ Dr Nisa Aslam says, “Vitamin B12 deficiency is a major health challenge for older adults. Signs of a shortfall include anaemia, cognitive decline and dementia, so it is often only picked up during incidental blood tests.”

Riboflavin

Riboflavin, also known as vitamin B2, helps the body release energy from food and is important for the nervous system and healthy skin and eyes.⁴⁹ Good dietary sources of vitamin B2 include milk, eggs and fortified cereals, which means the 5% of consumers who now report they are vegan are potentially at risk of a shortfall.⁵⁰

Dr Nisa Aslam warns, “Low B2 can cause fatigue, poor concentration and skin conditions.”⁵¹ Yet NDNS data confirm 23% of teens (11 to 18 years) have intakes below the LRNI, which rises to 32% among teen girls.

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Folate

Folate, also known as vitamin B9, is needed to form red blood cells and, more importantly, to reduce the risk of neural tube birth defects. Good food sources include leafy green vegetables, chickpeas, kidney beans and liver.⁵²

Dr Nisa Aslam says, “A large UK study published recently found that three-quarters of women of childbearing age have blood levels of folate below the levels needed to protect against neural tube defects.”⁵³ Worryingly, only one in 10 (11%) adults knows what to eat to increase their folate intake.⁵⁴

Dr Carrie Ruxton adds, “Women of childbearing age may benefit from iron or folate supplements if their diet is low in these nutrients. However, the HSIS research shows that only 16% of adults aged 19 to 64 take folic acid supplements, despite the UK Government [NHS] recommendation that women who are pregnant, or could get pregnant, should take a 400-microgram folic acid supplement daily until 12 weeks of the pregnancy.”



Vitamin D

Vitamin D shortfalls are common because few foods are naturally rich sources. These include oily fish, red meat, liver, egg yolks and fortified cereals. Plus, during the autumn and winter months, it is impossible for our bodies to make enough vitamin D from sunlight alone and with so few foods being a rich source of vitamin D, to maintain adequate vitamin D levels, taking a top-up supplement is advised by the NHS. As a result, the government's public health official advice is for everyone in the UK to take a supplement containing 10 micrograms of vitamin D from October to March, when the sunshine is scarce.⁵⁵

Dr Carrie Ruxton says, "Vitamin D helps regulate the uptake of calcium and phosphate, which are essential for healthy bones, teeth and muscles. Signs of a shortfall include muscle and bone pain, muscle weakness and spasms, and pins-and-needles in the hands or feet."⁵⁶

The NDNS data confirm that vitamin D intakes from food sources are just 21% of the 10-mcg recommendation in children aged 1.5 to 18 years and 27% in adults. The HSIS consumer data show that two-thirds of adults (67%) don't even know which foods contain vitamin D.⁵⁷

Calcium

Calcium is important for healthy bones and teeth, blood clotting and to regulate muscle contractions, including our heartbeat. Milk, cheese and dairy foods are the best dietary sources. While calcium is found in green leafy vegetables, the body can't digest it as readily.⁵⁸

The HSIS Food and Nutrition Sciences paper reports that one in 10 (9%) adults and one in six (17%) children aged 11 to 18 have intakes below the LRNI. Older adults aged 64- to 74-years and 75 years and over had better calcium intakes, with only 7% and 6% respectively falling below the LRNI.

Pharmacist Noel Wicks notes further, "It is concerning that the HSIS real-world data show that two-thirds of adults (66%) don't know what foods they should eat to increase their intakes⁵⁹ and just one in five have made an effort to increase the amount of calcium in their diet."⁶⁰

Signs of a shortfall include muscle cramps, especially in the back and legs; dry scaly skin, brittle nails; confusion and memory problems and irritability.⁶¹

“ WITH SO FEW FOODS BEING A RICH SOURCE OF VITAMIN D, TO MAINTAIN ADEQUATE VITAMIN D LEVELS, TAKING A TOP-UP SUPPLEMENT IS ADVISED BY THE NHS ”



Potassium

Potassium helps regulate fluids in the body and is needed for the heart muscles to work properly. Low levels increase the risk of raised blood pressure, kidney stones and bone loss.⁶² Good sources include bananas, broccoli, Brussels sprouts, fish, beef, chicken and turkey.⁶³

Dr Nisa Aslam says, "People with inflammatory bowel disease are at elevated risk of potassium deficiency, as are those who take certain medicines for hypertension. There are also a number of observational studies which suggest a link between lower potassium intakes and insulin resistance and type-2 diabetes."⁶⁴

The NDNS data shows that a third of [32%] children aged 11 to 18, 28% of adults aged 19 to 64 and one in five adults aged 75 years and over (23%) have potassium intakes below the LRNI. And sadly, fewer than one in five adults (18%) know what they should include in their diet to increase their intake of potassium.⁶⁵

Signs of a shortfall include muscle cramps and pain, weakness and fatigue, heart palpitations and constipation.⁶⁶

Iron

Iron is vital for the production of red blood cells, which transport oxygen around the body, so common signs of a shortfall include fatigue, lack of energy and pallor. Red meat and offal are rich in easy-to-absorb heme iron, and all white bread sold in the UK is fortified with iron.⁶⁷

Dr Emma Derbyshire warns, "Women lose iron during menstruation, which makes them more prone to low iron deficiency and iron-deficiency anaemia. Without enough iron, there is a greater risk of iron-deficiency anaemia, which can lead to tiredness, breathlessness, weakness and fatigue."⁶⁸

Dr Carrie Ruxton explains further, "Women of childbearing age may benefit from iron or folate supplements if their diet is low in these nutrients." Only 16% of adults aged 19 to 64 take

folate supplements according to the HSIS research, yet the UK government (NHS) recommends that women who are pregnant, or those who could get pregnant, should take a 400-microgram folic acid supplement daily until 12 weeks of their pregnancy."

Shortfalls of iron are common across all age groups, but are particularly problematic for women and girls. On average, women aged 19 to 64 achieve only 71% of the RNI and a third (34%) have intakes below the LRNI.

According to the HSIS poll, only one in three (33%) consumers know what to eat to increase their iron intake,⁶⁹ and just 28% have made a conscious effort to eat more iron-rich foods⁷⁰ - despite the fact that 76% believe it is 'very important' for health.⁷¹

“WOMEN LOSE IRON DURING MENSTRUATION, WHICH MAKES THEM **MORE PRONE TO LOW IRON DEFICIENCY**”



“WOMEN OF CHILDBEARING AGE MAY BENEFIT FROM IRON OR FOLATE SUPPLEMENTS **IF THEIR DIET IS LOW IN THESE NUTRIENTS**”

Omega-3

Omega-3 fats are key building blocks for cell membranes and are found throughout the central nervous system. Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA) are important for the heart, blood vessels, lungs and the immune and hormone systems.⁷² Signs of a shortfall include rough, scaly skin.⁷³

Oily fish is the best dietary source of these important long-chain fatty acids – EPA and DHA – and the NHS advice is that adults should eat at least two portions of fish a week (140g each), one of which must be an oily fish (eg. salmon, sardines, etc).⁷⁴ But the HSIS Food and Nutrition Sciences paper warns intakes are “considerably lower than the advised weekly portions”.

Dr Carrie Ruxton admits, “Oily fish isn’t liked by everyone, so it’s a good idea to find new ways to include it in your diet. Try different types as you may prefer one over another. Salmon, sardines, trout and herring are all good options, and canned or smoked versions are inexpensive store cupboard options.

“If you really don’t fancy fish or are following a plant-based diet, a high-quality omega-3 supplement can help to ensure you’re getting adequate amounts of Polyunsaturated fatty acids (PUFAs). Vegan options are made from algae.”

Zinc



Zinc supports wound healing, fertility and the body’s ability to process the protein, fats and carbohydrates we obtain from food.⁷⁵ Dr Nisa Aslam says, “Good dietary sources of zinc include meat, shellfish and dairy foods, so anyone following a vegan or vegetarian diet needs to take extra care to get enough from non-animal sources such as wheatgerm, nuts and seeds.

“Another potential challenge is that, despite zinc being one of the most abundant trace elements in the body, we can’t store it in significant amounts, so a regular dietary intake or supplement is needed to ensure adequate levels.”⁷⁶

The NDNS data confirms 23% of girls aged 11 to 18 have suboptimal levels and, among older age groups, 6% of 64- to 74-year-olds and 10% of those over 75 years have daily zinc intakes below the LRNI.

Selenium

Selenium helps the immune system work properly, supports reproduction and helps to protect cells and tissues from damage.⁷⁷ Dr Nisa Aslam says, “Selenium deficiency is associated with irregular heartbeat and other cardiac issues, immune system challenges and impaired musculoskeletal function,⁷⁸ but as there are often no obvious symptoms, it can be difficult to diagnose.”⁷⁹

Brazil nuts are one of the best dietary sources, along with fish and offal. However, the amount of selenium provided by our food is determined by soil levels in the country of production, leading to large fluctuations in selenium content.⁸⁰

The HSIS Food and Nutrition Sciences paper notes, “Selenium intakes are often insufficient from early childhood onwards. More than one-third (36%) of children aged 11- to 18-years had dietary selenium intakes below the LRNI.

“Concerningly, nearly half (45%) of UK adults aged 19- to 64-years and 65- to 74-years had insufficient selenium intakes, with the most vulnerable group being girls and women. Forty-five per cent of girls aged 11- to 18-years had selenium intakes under the LRNI. A staggering 57% of women aged 19- to 64-years had selenium intakes below the LRNI, 54% of women aged 65- to 74-years and 59% of women over the age of 75 years.

“THE AMOUNT OF SELENIUM PROVIDED BY OUR FOOD IS DETERMINED BY SOIL LEVELS IN THE COUNTRY OF PRODUCTION”





Magnesium

Magnesium is needed to convert the food we eat into energy and is crucial for the parathyroid glands, which regulate calcium and phosphorus levels in the blood and bones.^{81,82} Dr Emma Derbyshire says, “This is one of the many examples of how the availability of one nutrient affects another. It underlines the importance of ensuring adequate intakes across the board of vitamins, minerals, fatty acids and other critical nutrients.”

“ IODINE IS AN OFTEN-OVERLOOKED MICRONUTRIENT WHICH IS IMPORTANT FOR THYROID FUNCTION AND METABOLISM ”

Iodine

Iodine is an often-overlooked micronutrient which is important for thyroid function and metabolism. The richest sources are dairy foods, eggs, sea fish and shellfish.⁸³ Smaller amounts are found in cereals and grains, but like selenium, this will depend on the amounts of iodine in the soil.⁸⁴

The NDNS data confirm one in five (21%) children aged 11- to 18-years and 13% of adults aged 19- to 64-years have dietary iodine intakes from food sources which fall short of the LRNI. Urinary iodine concentrations (UIC) revealed evidence of clinical insufficiency across girls aged 11- to 18-years and women of childbearing age (16- to 49-years).

And this has declined since 2013, when the NDNS introduced UIC measurements. There has been a year-on-year decline in UIC, with this decreasing by 29% for girls aged 11- to 18-years and by 25% for adults aged 19- to 64-years between 2013 and 2023.

Dr Emma Derbyshire, one of the authors of the HSIS Food and Nutrition Sciences paper, says, “We knew there were a number of entrenched gaps in nutrient intakes, but the extent of the shortfalls exposed by our analysis, and declining intakes of so many nutrients, was a surprise - and a very unwelcome one.”

LAST WORD

Why We All Need To Future-Proof Our Health And Wellness.

Dr Carrie Ruxton says, "It's clear that we need to rethink our approach to health messaging and diet and nutrition education because, as the NDNS data and HSIS consumer research show, what we are doing is simply not working.

"It will take time to address these challenges, but it's evident that far too many people are already jeopardising their everyday wellbeing and long-term health by failing to get the right amounts of vitamins, minerals and nutrients in their diets."

Dr Nisa Aslam notes further, "Many common health challenges are likely to be rooted in sub-optimal nutrition. It is a factor in many of the wellbeing challenges - such as fatigue, low mood, poor sleep, stress, bloating and headaches - which affect a huge number of the patients I see in my surgery.

"We are also continuing to learn more about the different ways our gut microbiome impacts our health and risk of disease, with studies now linking favourable gut bacterial species to a range of health benefits, including reduced risk of metabolic syndrome, cardiovascular disease and high blood pressure.⁸⁵

"Crucially, we now know that probiotics - live 'friendly' bacteria in a capsule or food - assist in nutrient absorption and digestion, so are an

important element in any strategy to improve the nation's nutrient status."

Pharmacist Noel Wicks continues, "An achievable here-and-now solution to plug the nutrient gaps exposed by the NDNS and the HSIS consumer data is to take a daily multivitamin and multimineral supplement alongside an omega-3 supplement if you don't eat the recommended amount and types of fish and a probiotic for optimal gut function.

"All the evidence suggests that this simple, self-care nutrient approach will not only provide immediate benefits in terms of day-to-day health and wellbeing, it will also help to future-proof your health and reduce the risk of many life-limiting diseases and conditions."

Dr Emma Derbyshire adds: "Multivitamin and multimineral supplements are formulated to provide the ideal ratio of different nutrients, and there are many inexpensive options available - which, in my opinion, makes the potential return on a modest investment in good health a no-brainer."

ABOUT HSIS: HSIS (the Health and Food Supplements Information Service) is a communication service providing accurate and balanced information on vitamins, minerals and other food supplements to the media and to health professionals working in the field of diet and nutrition. Find out more at www.hsis.org



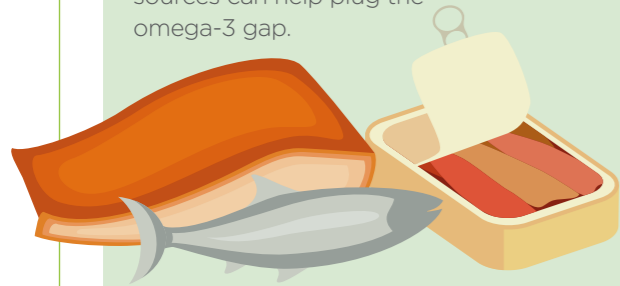
HEALTH HACKS TO IMPROVE YOUR NUTRIENT INTAKES



1 UP YOUR OILY FISH

In the UK, it's recommended that everyone eats two portions of fish per week, including one oily portion.⁸⁶ Dr Carrie Ruxton adds: "But oily fish isn't liked by everyone, so it's a good idea to find new ways to include it in your diet.

"Try different types as you may prefer one over another. Salmon, sardines, trout and herring are all good options, and canned or smoked versions are an inexpensive store cupboard ingredient. Try mixing oily fish into your meals; add flaked fish to pasta, salads, omelettes or wraps." If you can't eat fish, a high-quality omega-3 supplement from marine or algae sources can help plug the omega-3 gap.



2 EAT THE RAINBOW

If you aim to eat fruit and vegetables in a variety of different colours, you're more likely to hit the five-a-day target, consume the variety of nutrients we all need to fuel our health and wellness daily, plus you will also consume a wide range of healthy polyphenols. As a result, make sure each of your meals contains a variety of different coloured fruits and vegetables. "Different colours mean different nutrients," says Dr Emma Derbyshire. "Orange and yellow fruits and vegetables contain beta-carotene (a type of vitamin A); red and purple variants contain vitamin C and antioxidants, while green fruits and vegetables contain folate, magnesium and iron."⁸⁷

Meal tip:
Why not try adding a handful of frozen peas to your pasta or soup, throw some peppers into your omelettes or sprinkle berries on top of your cereal?

3 FIBRE UP

Fibre is crucial for maintaining a healthy digestive system, preventing constipation, and lowering the risk of chronic diseases such as heart disease. It aids in weight management by increasing satiety and helps regulate blood sugar levels, making it essential for overall long-term health. Noel Wicks notes: "We all need 30g of fibre daily, but most of us fail to consume our daily needs." As a result:

Choose whole grains:

Switch to brown rice, whole-wheat pasta, oats, and whole-grain bread.



Eat more fruit and veg:

Consume fruits and vegetables, preferably with skins on.



Love legumes:

Incorporate beans, lentils, and peas into meals.



4 Add olive oil to salad dressings or roasted root vegetables:

This will maximise absorption of the fat-soluble vitamins A, D, E and K in fruit and vegetables.⁸⁸

5 EAT SMART

"Combining different foods can boost nutrient absorption", says Dr Nisa Aslam. "Eat vitamin C-rich foods with iron-rich plant foods, such as spinach and lentils, to increase absorption or choose yoghurts fortified with vitamin D, which will improve calcium absorption".

6 AIM FOR A MIX OF COOKED AND RAW FOODS

Cooking increases concentrations of some nutrients, such as beta-carotene and the lycopene

in tomatoes and makes others easier to digest.^{89,90}

But heat destroys much of the vitamin C in vegetables,⁹¹ which is why steaming or microwaving is better than boiling.⁹²



7

BRIDGE DIETARY GAPS WITH SUPPLEMENTS

Although a food-first approach is best, many of us, as we've seen from the HSIS research, struggle to include all the nutrients we need daily and most don't eat 5 fruit and vegetables a day. As a result, we should all be taking a multivitamin and multimineral supplement, plus an omega-3 or fish oil supplement daily, to help bridge these nutrient gaps and future-proof our health and wellness.

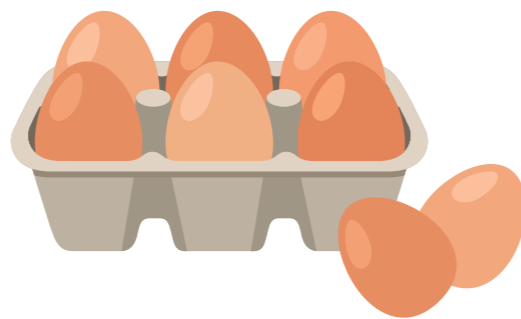
In addition, from October to March, when the sunshine is scarce, the NHS advises that everyone in the UK should take a supplement containing 10 micrograms of vitamin D. Although supplement use does increase with age, it remains patchy as only 28% of adults aged 19 to 64 take vitamin D, according to the new data.

Dr Carrie Ruxton concludes: "We all need to improve our diets, but there's no reason why we shouldn't achieve our nutrient recommendations while we are making essential changes to our eating habits. Adding a multivitamin and multimineral supplement to our daily routine is a simple, affordable way to support health and wellness for the whole family".

8

HAVE A PROTEIN FIX

High protein foods - whether red meat, eggs, fish, poultry, nuts, beans or pulses - are rich in minerals and vitamins and help to keep us feeling fuller for longer. Protein also boosts the absorption of zinc.



“AS WE'VE SEEN FROM THE HSIS RESEARCH, MANY OF US STRUGGLE TO INCLUDE ALL THE NUTRIENTS WE NEED DAILY”



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