



MIND THE **NUTRIENT** **GAPS**

DIETS THAT DRIVE DEFICIENCIES



INTRODUCTION

BRITAIN is a nation in dietary denial — a toxic mix which is putting thousands of people at risk of health-harming nutrient deficiencies. New research reveals that most people rate their diet ‘excellent’ or ‘good’,¹ but two out of three adults are not eating enough fruit and vegetables² and one in six is excluding or restricting entire food groups.³

The latest National Diet and Nutrition Survey (NDNS) — an official overview of the nation’s diet — confirms glaring nutrient gaps across all age groups. Philip Calder, Professor of Nutritional Immunology at the University of Southampton says: “The figures are concerning, there is no other word for it. Nine out of ten women of child-bearing age now have such low levels of folate that if they became pregnant, their child would be at increased risk of neural tube defects.”⁴

“Iron deficiency affects one in ten women, intakes of vitamin D fall far short of the recommended amounts and nine out of ten adults are not eating enough fibre.”

Consumers are being swamped by a deluge of information and dietary advice, and tens of millions of pounds have been spent on government and other campaigns to encourage healthy eating. But the latest data show scant evidence of improvement — and by some measures, our diets are actually getting worse.

The number of children aged 11 to 18 who are eating five portions of fruit and vegetables a day has dropped by 20% since the first NDNS survey in 2008-09. The number of working-age women are not getting enough folate has doubled, and the number of over-65s who don’t consume enough calcium has tripled.⁵

Vitamin A is so abundant in foods that the NHS advises: “You should be able to get all the vitamin A you need by eating a varied and balanced diet.” It even warns: “If you take a supplement that contains vitamin A, don’t take too much because this could be harmful.”

Yet the latest NDNS data show the number of children aged four to 10 who are not getting the minimum intake of vitamin A for good health has tripled since the first survey a decade ago. In children aged 11 to 18 this has jumped by 62% and there has been a similar rise (63%) in adults.

The release of the latest NDNS data comes as independent research for the Health & Food Supplements Information Service (HSIS) exposes some extraordinary, and potentially dangerous, disconnects between our dietary perceptions and realities — and it shines a light on the dangers of fad diets and some supposedly healthy eating regimes.

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Intermittent fasting, or the 5:2 diet as it is also known, topped NHS Choices’ list of most popular diets last year, followed by the Dukan, Paleo, New Atkins and Alkaline diets. All have their celebrity followers — as well as potential pitfalls.⁶

Jennifer Aniston, former chancellor George Osborne, and actor Benedict Cumberbatch are said to favour the 5:2. Kate Middleton reportedly relied on the Dukan diet to shed weight before her wedding. Former US president Bill Clinton and singers Miley Cyrus and Tom Jones are fans of Paleo eating. Actress Renee Zellweger and reality star Kim Kardashian have reportedly dropped pounds with New Atkins, while actress Gwyneth Paltrow and model Elle Macpherson stick to the Alkaline diet.

Dietitian, Dr Carrie Ruxton says: “A lot of these diets have been popularised by celebrities who have reportedly lost weight using them, but celebrities should never be your go-to for health advice. Often, they don’t even need to lose weight in the first place. Being a great actor, or starring in a TV reality show, does not qualify you to give health and nutrition advice, and in some cases, celebrities have been paid to promote a product or eating plan, or they are plugging their own products or websites.

“Unless there are medical reasons for doing it, any eating plan which restricts or demonises particular foods is problematic. There is no doubt that too many people are consuming too many calories and will gain benefits from shedding excess weight. But there are also risks, because cutting calories often means cutting nutrients, too.”

Even the 5:2 diet — which was originally championed by TV medic Dr Michael Mosley — has its drawbacks.

Nutritionist, Dr Emma Derbyshire explains: “Intermittent fasting, or 5:2 eating as it is also known, is often presented as a clinically proven and problem-free way to lose weight. But most of the studies showing benefits were done in the laboratory, not in human based trials, and two days of intense calorie restriction inevitably means two days of nutrient restriction, too.”⁷

As the British Dietetic Association has warned: “There are lots of versions of this diet, with some less safe than others.”⁸

And there are things diets can’t deliver. For example, diet alone is not likely to ever provide all the vitamin D we need — which has prompted advice from Public Health England that we should all consider taking a supplement during autumn

and winter, when we cannot make vitamin D from exposure to sunlight.

The HSIS survey also found that 57% of people questioned admitted they sometimes worry their diets are not up to the job.

Professor Philip Calder notes: “The bottom line is that, for a number of reasons, poor nutrient intakes are a fact of life in Britain today. Fad diets, advice from ill-informed celebrities and social media ‘influencers’, calorie restriction, skipping meals and the popularity of ready meals and takeaways are just a few of the factors driving the risk of nutrient deficiency.”

This report details the nation’s alarming nutrient gaps and the risks associated with popular eating plans, calorie restriction diets and lifestyle choices which exclude specific food groups. It explores the negative impacts nutrient shortfalls can have on health and well-being and suggests strategies to ensure we get the balance of vitamins, minerals and other nutrients we need to support and maintain good health.

Professor Philip Calder, Dr Carrie Ruxton, Dr Emma Derbyshire, GP, Dr Gill Jenkins

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COULD YOU BE CAUGHT SHORT?

There will always be some at-risk groups who struggle to achieve sufficient intakes of important vitamins, minerals and fatty acids. And there are times in our lives when our bodies demand more nutrients than our own diets can deliver.

But the latest NDNS exposes a much wider problem, with shortfalls of key nutrients across all age groups.

Coupled with data from the HSIS survey, which confirm that almost one in three adults (30%) is now excluding at least one food group from their diet, it paints a worrying picture of the nation's nutrient status.

The HSIS survey also uncovers some curious contradictions around our attitudes to diet and nutrition. Just over half (52%) of those surveyed described their diets as excellent or good, but even more (58%) worried their diets were not delivering all the nutrients they need.

Fewer than one in five adults eats at least five or more portions of fruit and vegetables a day; more than half (54%) do not eat dairy products or an alternative with added calcium on a daily basis; and one in five (19%) eats whole grain foods less than once a week. Dietitian Dr Carrie Ruxton notes: "The NDNS paints a similar picture, with only one in three adults (31%) achieving the five-a-day target for fruit and vegetables and nine out of ten children

falling short of the recommendation. Shockingly, the number of children eating five-a-day has actually fallen from 10% in the first survey in 2008-09 to 8% in the latest one.

"Perhaps not surprisingly, the HSIS survey confirms that four out of five adults experience minor health concerns such as dry skin and hair, muscle twitches, constipation and cramps which could be the result of nutrient shortfalls."

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Vitamin A

Women need 0.6mg a day and men need 0.7mg of vitamin A. Good sources include milk and dairy products, eggs and oily fish. The beta-carotene in yellow and red vegetables and yellow fruits can also be converted into vitamin A by our bodies.⁹

The Chief Medical Officer recommends that all children aged six months to five years take a daily supplement containing vitamins A, C and D. But the NHS advises that food sources of vitamin A are so plentiful, everyone else should be able to get all we need from diet alone.

Yet the number of children aged 18 months to three years who are not achieving the lower reference nutrient intake (LRNI) of vitamin A, which is the minimum recommended for good health, has almost doubled and now stands at 15% — or one in six — up from 8% in the first survey in 2008. In four- to 10-year-olds the number falling short has tripled (4% to 12%).¹⁰

A quarter (24%) of girls aged 11 to 18 are not achieving the LRNI for vitamin A and one in eight adults (13%) is falling short of Vitamin A. Older adults are the only age group coming close to adequate intakes of Vitamin A with nine out of ten (93%) of over 65s achieving the target intake.



Dr Emma Derbyshire says: "The NDNS shows that the official view that we get all the vitamin A we need from our diets is misplaced. Symptoms of vitamin A deficiency include dry hair; dry mouth; dry, itchy, bumpy skin; broken nails; cracked lips and mouth sores, more frequent infections and delayed wound healing.¹¹ The HSIS survey confirmed two out of five (41%) adults experience dry skin, 15% have dry hair and one in five (22%) has brittle nails."



Calcium

Adults need 700mg a day, which the NHS says they “should” be able to get from food sources such as milk and dairy products; soya, broccoli, cabbage and nuts. However, the HSIS survey confirms that although four out of five (81%) recognise dairy as a good source of calcium, more than half (56%) don’t eat dairy products, or an alternative with added calcium, on a daily basis, and 12% never consume them.

Calcium is crucial for strong bones, particularly during childhood and the teens, when bone density peaks. But the NDNS reveals widespread shortfalls of calcium, with one in five (22%) girls aged 11 to 18 failing to achieve the target, an increase of 47% since the first NDNS; intakes are also falling among boys of the same age with 16% now failing to meet the target, compared to 11% a decade ago.¹²

One in ten (9%) adults aged 19 to 64 is not getting enough calcium and 11% of women over 65, who are at increased risk of osteoporosis and fragile bones, are falling short.

Dr Carrie Ruxton notes: “Signs of a shortfall include brittle nails, which was an issue for 22% of those who took part in the HSIS survey, brittle hair (15%) and poor memory, which was reported by 25% in the same survey.”

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Vitamin D

There are small amounts in oily fish, red meat, liver, egg yolks and fortified foods, but we make most of our vitamin D from sunlight — and this can be limited by spending a lot of time inside, regular use of sunscreens, covering up with clothing and darker skin colour.

Dr Ruxton says: “It was once assumed that we could store enough during summer to get through the winter months, but the NHS now says anyone over the age of four “should consider taking a daily supplement containing 10mcg of vitamin D in the autumn and winter months”. Supplementation is recommended year-round for infants and at-risk groups such as pregnant and breastfeeding women, elderly, housebound people, and those who cover their skin for cultural reasons.¹³

“And while fortified cereals can provide useful amounts of vitamin D and other nutrients, some also contain a lot of sugar.”

However, children aged four to 10 are getting just 20% of the recommended intake of 10mcg from food alone, this rises to only 27% when supplements are included. For teens the intakes are 21%, rising to 35% when supplements are included while for working age adults, only

27% are getting enough from food alone, with 42% getting 10mcg when supplements are included. The only group remotely in reach of the recommendation is women aged 65-74, 65% of whom reach recommended intakes when supplements are taken into account.¹⁴

Furthermore, NDNS data suggests that many parents are either unaware of the guidance that children up to the age of four should be given supplements, or they are ignoring it. The average vitamin D intake of children aged 18 months – three years is only 29% of the recommended 10mcg, and this includes vitamin D from supplements. This indicates that very few children are being given appropriate supplements.

“Vitamin D aids absorption of calcium and phosphate, which makes it important for bone health.

Intakes are now so low in the UK there has been a rapid rise in cases of rickets, a bone deformity common in the Victorian era.¹⁵ There is also evidence that vitamin D is important for immune function and may protect against infections, diabetes, heart disease and some cancers, as well as auto-immune diseases such as multiple sclerosis,” adds Dr Carrie Ruxton.^{16,17}

Fibre

Something of a ‘Cinderella’ nutrient, fibre is known primarily for its importance in maintaining healthy bowels. But emerging evidence suggests it may be far more important than many of us acknowledge.

GP, Dr Gill Jenkins notes: “Studies which suggest that dietary fibre reduces the risk of heart disease, stroke, diabetes and bowel cancer prompted the Government to raise the recommended fibre intake in 2015, lifting it from 18 to 30 grams a day for teens and adults, with smaller amounts for children. However, the NDNS confirms that very few people achieve their recommended intakes.¹⁸”

Nine out of 10 children (90%) aged 18 months to 10 years of age do not get enough fibre, along with a similar number of working-age adults (91%) and people aged over 65 (93%). Women are the most likely to lack fibre in their diets, with 96% of those aged 19-64 years falling short, compared with 87% of men of the same age.¹⁹

HSIS data show that one in six adults experiences constipation, a common sign of insufficient fibre, with more women than men complaining of problems (24% vs 13%). Fibre-rich foods include beans and other pulses, fruit and vegetables and whole-grain foods, but one in six (16%) people eat whole-grains just once a week or less.

Folate

Adults need 0.2mg a day, and women planning a pregnancy are advised to take a 0.4mg supplement to help prevent birth defects.²⁰ For those who aren’t pregnant, the NHS advises that we “should” get enough from food sources such as green leafy vegetables and fortified breakfast cereals.²¹

Teenage girls have the lowest levels of folate, with one in seven (15%) failing to achieve the minimum intake for good health and deficiencies have doubled in this group since the first NDNS survey in 2008 (7%), as they have in women aged 19 to 64 (from 3% to 6%).²²

Blood tests confirm that nine out of 10 women (91%) of childbearing age have such low red blood cell folate levels that their child would be at risk of neural tube defects if they fell pregnant — and one in 10 (9%) has such low levels that their child would be at ‘high’ risk.²³

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Drinking alcohol in excess of recommended limits can increase the risk of folate deficiency and warning signs of low levels include gum disease, tongue inflammation, loss of appetite, shortness of breath, irritability, diarrhoea and forgetfulness.

Iodine

Sea fish and shellfish are good sources of iodine and while it is found in dairy foods, cereals and grains, the amount in these is dependent on iodine levels in the soil. Adults need 0.14mg a day, which they “should” be able to get from a balanced diet according to the NHS.²⁴

The most recent NDNS results show that one in five children (20%) aged 11 to 18 years is not reaching the LRNI of iodine, with girls far more likely to be low in iodine than boys (27% compared to 14%). One in eight (12%) working-age adults are also not getting enough iodine — an increase of 71% since the first NDNS.²⁵

The HSIS survey results confirm a number of adults reporting signs that could indicate a dietary shortfall including tiredness (21%), difficulty concentrating (25%), hair loss (19%) and dry skin (41%). Other clues include feeling cold even when it’s warm and unusual weight gain.

Iron

Typical menstrual losses mean that pre-menopausal women require a daily iron intake of 14.8mg, while men, and post-menopausal women need 8.7g. The NHS position is that: “You should be able to get all the iron you need from your daily diet”.

However, the HSIS survey reveals that one in five (14%) people do not eat meat, which increases the risk of a shortfall as red meat is the richest source of bioavailable iron, called haem iron. This is three times better absorbed than the non-haem iron found in plant sources and fortified foods. Non-meat sources of iron include pulses, dried fruit, fortified breakfast cereals, and dark green leafy vegetables.

The HSIS data show that women are more likely to avoid meat than men (15% compared to 13%) and the NDNS confirms that risk of deficiency is high in females, with more than half (54%) of girls aged 11 to 18 years, and over a quarter (27%) of women aged 19 to 64 years, failing to meet the recommended minimum intake. In the younger group, intakes have fallen by 26% in the past decade whilst in adult women they are down by 29%.²⁶

“Our bodies need iron to make haemoglobin, which transports oxygen around the body, so tiredness is the most common sign of a shortfall — and this was reported as a frequent problem by one in five (21%) respondents to the HSIS survey and ‘sometimes’ an issue for a further third (32%). Crucially, women were the most likely to report problems, with a quarter (25%) complaining they were often tired, compared with 16% of men,” says Dr Carrie Ruxton.

Other potential signs of iron deficiency experienced by survey respondents include hair loss (19%), brittle nails (22%) and breathlessness (16%). Dizziness, cold hands and feet, pale skin, restless legs and heart palpitations may also indicate poor levels of iron.

Magnesium

This mineral helps us get energy from food and supports the production of hormones needed for bone health. Deficiency has been linked to an increased risk of diabetes and pre-diabetes.²⁷

Men need 300mg a day and women 270mg but the NHS says we “should” be able to get all our needs from foods including nuts, fish, meat, dairy products and leafy green vegetables.²⁸



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Yet the HSIS data confirm that many of us in the UK have low intakes of a range of magnesium-rich foods, or avoid them all together, with 14% avoiding meat, 12% avoiding dairy products and more than a quarter (26%) eating leafy greens only twice a week or less frequently.

Dietary gaps are confirmed by the NDNS data which reveal that more than a quarter of teenage boys (27%), and half the girls in this age group, are not achieving the LRNI. Among working-age adults, 13% are not achieving the target intake and 16% of over-65s are also falling short.²⁹

A significant percentage of those questioned for the HSIS survey reported possible signs of magnesium deficiency, including poor memory (25%), fatigue (21%) and cramps (18%).

Omega 3 fatty acids

Oily fish, such as mackerel, herring, sardines and salmon are our best sources of marine omega-3 fatty acids — healthy fats which may help prevent heart disease, with studies suggesting that eating two or more portions of oily fish a week reduces the risk of coronary heart disease by around 25%.³⁰

Omega-3 fats are also important during pregnancy as they support development of the baby’s eyes and nervous system, and there is evidence they are a useful co-therapy for children with ADHD.^{31,32}

NDNS data confirm the average adult intake of oily fish is 56grams a week — well short of the recommended 140grams. Over 65s ate the most oily fish, with an average of 84grams per week.³³ Hence in most people intake of marine omega-3 is likely to be much lower than what is recommended.

Potassium

Potassium regulates heart muscle and the balance of fluids in the body and adults need 3,500mg a day which they “should” get from foods including bananas, pulses, beef, nuts and seeds — yet the number of people not achieving the LRNI is increasing.

More than a quarter (28%) of children aged 11 to 18 years do not get the minimum recommended intake — 22% more than those in the first NDNS in 2008-09. Twice as many girls as boys are missing the target (38% compared to 18%). There is a similar picture among working-age adults with 23% of women and 11% of men failing to meet the LRNI. This rises to 27% of women over 65, with men doing far better with only 9% not achieving the recommended amount.³⁴

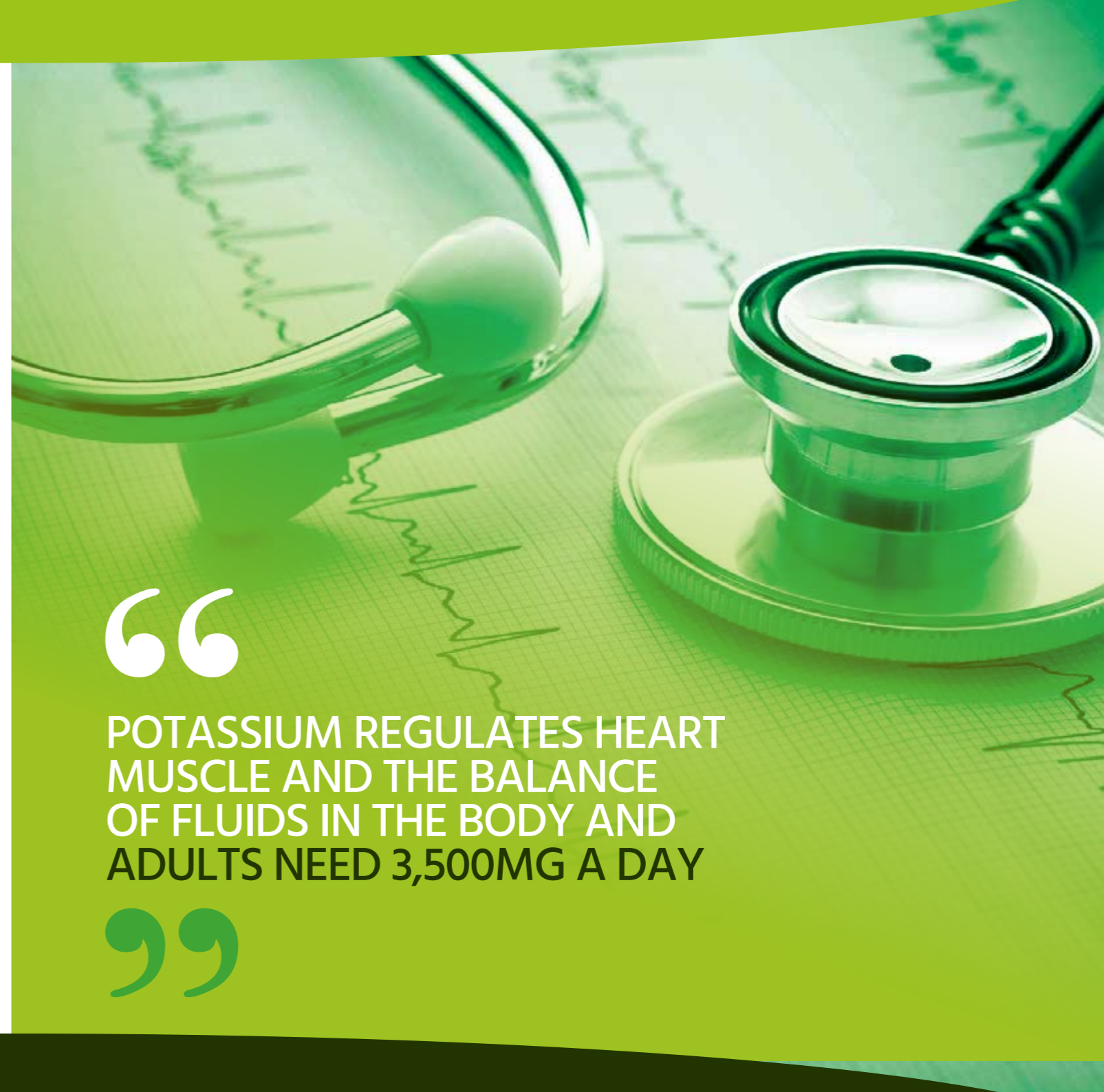
Dr Gill Jenkins notes: “Potassium deficiency can lead to cramps, which were reported by 18% of respondents to the HSIS survey, depression, muscle weakness, tingling or numbness, abdominal bloating, thirst and frequent urination.”

Riboflavin

Also known as vitamin B2, riboflavin is important for the nervous system and healthy skin and eyes. It also helps the body make energy from food. Men need 1.3mg a day and women 1.1mg.

The NHS advises, “You should be able to get all the riboflavin you need from your daily diet.” Good sources include fortified breakfast cereals (which are often criticised for being high in sugar), milk, eggs and brown rice; however, food sources should be kept out of daylight as UV destroys riboflavin.³⁵

The latest NDNS data show that twice as many women, compared with men, are not reaching the recommended riboflavin intakes. One in ten adults aged 19 to 64 years has low intakes of the nutrient, but 14% of women are falling short, compared with 6% of men. One in five teens is not achieving the recommended intake, and again, the problem is much worse in girls (26%) than boys (13%).³⁶



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Dr Gill Jenkins says: “Signs of a shortfall include hair loss, which was a problem for one in five adults (19%) who took part in the HSIS survey. Other clues include cracked skin, particularly around the lips, sore throat and dry itchy eyes. Severe deficiency can disrupt metabolism of other important B-vitamins and lead to anaemia, liver degeneration and nervous system problems.”

Selenium

NHS advice is that men need 0.075mg a day and women 0.06mg and we “should” be able to get selenium from a balanced diet. Food sources include Brazil nuts, fish, meat and eggs, but as the HSIS survey shows, significant sections of the population avoid, or have low intakes of some of these foods.

Another challenge with obtaining this nutrient from dietary sources is that even in selenium-rich foods, such as Brazil nuts, levels can vary enormously, depending on selenium concentrations in the soil, rainfall and groundwater, the structure of the soil and even the root system of individual plants and trees.³⁷

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Selenium supports the immune and reproductive systems and protects cells and tissues from free radical damage.³⁸ Higher intakes are associated with reduced cancer risk, although it is not clear whether or not supplementation helps to prevent cancer.³⁹

“Shortfalls are widespread with more than a third of teens (35%) and working-age adults (36%) and over half of over-65s (52%) failing to achieve the LRNI of selenium. Two out of three (66%) women over 65 are lacking in selenium, a rise of 29% since the first NDNS”, says Dr Emma Derbyshire.⁴⁰

Dr Gill Jenkins adds: “Digestive disorders and high alcohol intakes increase the risk of selenium deficiency — and two out of three (61%) adults quizzed for the HSIS survey admitted they sometimes drank more than the recommended maximum of 14 units a week.”

Zinc

This trace element is important for wound healing and immunity. Men need 9.5mg of zinc a day and women require 7mg. Dietary sources include meat, shellfish and dairy, and the official NHS position is that we “should” get sufficient amounts from foods.⁴¹

Dr Gill Jenkins notes: “Zinc has a special role in growth and development, but shockingly, the NDNS data reveal that children are the most likely group to be lacking this nutrient, with more than one in four 11 to 18-year-olds (22%) failing to achieve the recommended intake, and more than a quarter (27%) of girls missing the target.”^{42,43}

“As is the case with selenium, digestive disorders and high alcohol intakes increase the risk of zinc deficiency and another challenge is that zinc from plant sources is not as easily absorbed as the zinc from meat and fish.

“Signs of deficiency include hair loss, which was an issue for one in five (19%) of respondents to the HSIS survey. Other clues include frequent coughs and colds, slow wound healing, hair loss, skin problems including acne, eczema and dry skin; white coating on the tongue and impaired sense of smell.”

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DIETS THAT
DON'T DELIVER

Britain is not only a nation in dietary denial, it is also a nation of dieters, with half of us (48%) having tried to lose weight in the past year.⁴⁴ That adds another dangerous dimension to our nutrient status because calorie restriction and nutrient restriction often go hand-in-hand.

Some of the issues have been widely aired. A number of studies and experts have raised concerns about the lack of fruit, vegetables and fibre in popular weight loss regimes such as the Atkins, Dukan and some Paleo eating plans. But it is not only intakes which are a problem, some of these diets can also undermine our body's ability to absorb key nutrients, and even unbalance our gut bacteria.^{45,46}

Dr Carrie Ruxton explains: "Some vitamins — such as A, D, E and K — are fat soluble and we need some fat in our diet to absorb them properly. Many weight loss diets treat all fats as being the same, when there is nothing further from the truth.

"Trans fats, found in fried foods and some reduced fat products, can increase the risk of heart disease and other health problems, while the omega-3 fats in oily fish, nuts and seeds have the opposite effect and are incredibly important for good health. And again, there are considerations around absorption which are often overlooked."^{47,48}

Dr Carrie Ruxton adds: "Some of these diets need a great deal of commitment and concentration to prevent nutrient gaps, and in an ideal world, can be made to work in the short term. But we live in the real world, and most people do not have the time or nutritional know-how to ensure they are getting an adequate intake of all the nutrients they need for good health."

And it is not just fad diets that can increase the risk of deficiencies. It is estimated that 2% of the population is now vegetarian and almost half of this group follows an even more restrictive vegan diet.⁴⁹ A number of studies confirm they have much higher rates of iron-deficiency and anaemia than meat-eaters.^{50,51}

So how do some of our lifestyle choices and eating plans stack up?

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Weight loss

They come in many different guises, but ultimately all successful weight loss diets work by cutting calories — with a deficit of 3,200 calories needed to shed a pound in bodyweight (or 7,000 calories to lose a kilo).⁵²

Health watchdog, NICE, advises that a weekly weight loss of one or two pounds is sustainable, which translates to a daily calorie reduction of 500 to 1,000. But Dr Carrie Ruxton points out: “Not all calories are equal in terms of the good nutrients they provide which means that we need to choose our foods wisely. To maintain nutrient levels while cutting calories to this extent, it’s essential to eat a wide range of nutrient-dense foods. But studies show we often cut calories by adopting high-risk strategies such as skipping meals.”

A study of female college students in America found that a third (32%) missed out on breakfast in order to control weight, while a UK survey found that one in five (21%) skipped meals. Missing breakfast is particularly problematic as fortified breakfast cereals with milk provide a significant proportion of B vitamins, iron and calcium, and skipping breakfast increases the risk of nutrient gaps.

Intermittent fasting, or the 5:2 diet has been shown to increase lifespan, improve cognition, reduce oxidative stress and protect against cardiovascular disease — in animals.⁵³ Dr Michael Mosley, who wrote one of the biggest selling books promoting the diet says: “Studies of intermittent fasting show that not only do people see improvements in blood pressure and their cholesterol levels, but also in their insulin sensitivity.”

However, a small trial from the University of Surrey and King’s College London reported very little difference between 5:2 dieters and those on who ate a balanced reduced calorie diet every day.⁵⁴

“**SKIPPING BREAKFAST INCREASES THE RISK OF NUTRIENT GAPS.**”

The British Dietetic Association verdict is: “The 5:2 is a simple way to reduce calorie intake,” But it warns: “There are lots of versions of this diet, with some being less safe than others. If you choose to follow this diet, choose an evidence-backed plan based on healthy, balanced eating and written by a dietitian, such as the *2-Day Diet*.”

The *2-Day Diet*, devised by Dr Michelle Harvie and Professor Tony Howell — an award-winning research dietitian and an international expert in lifestyle measures to prevent cancer — stresses the importance of eating nutrient-dense foods, and comes with a number of caveats and resources stressing the importance of fibre, electrolyte balance and avoiding nutritional deficiencies.⁵⁵ But celebrity followers often treat intermittent fasting as a license to binge, with a US chat show host admitting his ‘meals’ could consist of peanut butter and an apple, the whites of hard-boiled eggs, or possibly a bowl of oatmeal, and, “The rest of the week I’m a glutton — pizza and pasta and steak.”

Dr Carrie Ruxton says: “This might tick a lot of boxes in terms of short-term weight loss and avoiding the feelings of deprivation we so often associate with dieting — but in the long term it is likely to lead to the deprivation of key nutrients, and you may not end up losing weight with a binge-starve dietary pattern.”



Low carb ketogenic diets

Ketogenic diets, which are very low in carbohydrates and high in fat, were first used to help control epilepsy which did not respond to anticonvulsant medicines. Proponents of these diets claim they work by forcing the body to burn fats instead of carbohydrates.

This process, known as ketosis, features in a number of low-carb diets include the Atkins, Dukan and some Paleo eating plans and there is no doubt it enables rapid weight loss. However, the downsides of ketosis include bad breath, constipation and dizziness.

Dr Gill Jenkins says: “Lack of fibre is a major issue with all of these low-carb and ketogenic diets, while restricted intakes of fruit and vegetables can increase your risk of deficiencies across the board.”

Indeed, Dr David Ludwig, a professor of nutrition at Harvard School of Public Health has warned: “If not done correctly, a ketogenic diet carries important risks, including nutrient deficiencies, hypovolemia [decreased blood volume], hypokalemia [dangerously low blood potassium], kidney stones, and gout.”⁵⁶

The Dukan Diet reportedly helped an already slim Kate Middleton drop another two dress sizes, and other high-profile fans include Jennifer Lopez and supermodel Gisele Bundchen.⁵⁷

There are four phases to the regime, with the first consisting of five days of almost nothing but lean proteins, no vegetables, fruit or dairy and minimal fat. The second phase, which continues until the dieter achieves their goal weight, also bans fruit and dairy foods.⁵⁸

The British Dietetic Association warns: “Rapid weight loss can be motivating, but it’s unsustainable and unhealthy. The Dukan diet isn’t nutritionally balanced, which is acknowledged by the fact you need a vitamin supplement and a fibre top-up in the form of oat bran.”

Dr Emma Derbyshire adds: “There’s a danger that rapid weight loss diets and eating regimes like the Dukan diet could increase your risk of long-term health problems if you don’t stick to the rules and that means taking a multi-vitamin and multi-mineral supplement daily to plug nutrient gaps caused by such slimming programmes.”

The Atkins Diet is also a high-protein, ketosis-inducing eating plan, with a daily allowance of carbohydrates of just 20 to 25g in the initial phase.

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The BDA warns: “The amount of processed meat, red meat and saturated fat in this type of diet is an issue, as is the advice to add salt.”

One study, which looked at potential nutrient gaps in a number of popular diets, found the *Atkins for Life* diet did not provide the recommended daily intake of 13 essential vitamins, 17 essential minerals and two essential fatty acids (32 essential micronutrients) evaluated — hence the advice that anyone following the diet should also take a daily multivitamin supplement.⁵⁹

Paleo

Unlike the Dukan plan, there is no official ‘Paleo’ diet, but it is based on the types of foods our hunter-gatherer ancestors may have eaten 10,000 years ago — i.e. meat, seafood, eggs, nuts, seeds, fruits and vegetables. On the banned list are any processed foods, refined sugars, potatoes, most cereal grains, and dairy foods.

A review published in the *American Journal of Clinical Nutrition* reported greater short-term improvements in a number of measures of metabolic syndrome including waist circumference, triglycerides, blood pressure and fasting blood sugar.⁶⁰



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A MORE RECENT MARKET REPORT SUGGESTS 6% OF THE POPULATION IS 'MAINLY VEGETARIAN'

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However, the British Dietetic Association verdict is: “Most versions of the diet encourage eating a lot of meat, which runs counter to current health advice on meat consumption (up to 500g per week cooked). Many versions ban dairy products and wholegrains, which form part of a healthy, balanced diet.”

The BDA goes on to warn: “Cutting out food groups without careful substitution can lead to nutritional deficiencies.”

The Alkaline Diet is based on the premise that our foods determine the acidity or alkalinity of our blood which, in turn, influences our weight and health. Some adherents even falsely claim that an Alkaline diet can help prevent and combat cancer.⁶¹

There are a number of pluses to the plan, which involves cutting back on processed meats, refined sugar and alcohol and increasing consumption of fruit and vegetables, which are supposedly alkaline. But no dairy products are allowed and even lean red meat, a good source of iron, has to be limited.

According to the BDA there is no evidence that diet can change blood pH levels — as a normal healthy body manages this fine without intervention.

Vegetarian

More and more people are cutting out meat, either totally or some days of the week. Data from the 2012 NDNS estimate that 2% of Britons — 1.2 million people — were vegetarians. A more recent market report suggests 6% of the population is ‘mainly vegetarian’ — eating some fish, but no meat — and 3% are completely vegetarian, eating dairy and eggs but no meat, poultry or fish.⁶²

Vegetarians are less prone to obesity and have a lower risk of some cancers, but a recent evidence review found their diet is often low in omega-3 fatty acids, high quality proteins, calcium, zinc, iron and vitamins B12 and D.⁶³

Vegan

Vegans generally have lower cholesterol and blood pressure, which reduces their risk of heart disease. One South American study found vegans had total cholesterol counts that were 32% lower than people eating a mixed meat and plant diet, and their harmful LDL cholesterol levels were 44% lower.^{64,65}

But as vegans avoid all foods which come from animals, they need even greater planning and attention to food combinations than vegetarians in order to maintain adequate levels of key nutrients including omega-3 fatty acids, proteins, calcium, zinc, iron and vitamins B12 and D. The EPIC-Oxford study confirmed that vegans have the lowest intakes of vitamin D and, on average, they get just a quarter of the amount that people who eat meat get from their diet.^{67,68}

Studies confirm that long-term adherence to a vegan diet is associated with much lower bone mineral density and an increased risk of fractures as a result of brittle bones.⁶⁹

Dairy-free

It is estimated that three-quarters of the world's population loses the ability to digest lactose at some time in adulthood, and scientists have discovered several genes which determine how well our bodies cope with lactose which evolved alongside the domestication of cattle during the last 10,000 years⁷⁰ — which probably explains why people of northern European descent are less prone to lactose intolerance than those of African descent.

However, many people who are lactose intolerant can eat cheese, butter, yoghurt and up to 200ml of milk without any problems — so long as they do so at mealtimes — and ditching dairy is not without risk.^{71,72}

“Every year in the UK people suffer more than 300,000 bone fractures linked to fragile bones”, notes Dr Carrie Ruxton. She adds: “One in two women and one in five men over the age of 50 will break a bone, and studies confirm that people who fracture a hip because of fragile bones are also at increased risk of death.”^{73,74}

Dairy foods are one of our best dietary sources of calcium, which is essential for strong bones. So, anyone who excludes or restricts dairy products must look for alternate sources of these nutrients to protect their bone density and avoid fractures in later life. Calcium is also vital from adolescence to our mid-twenties when bones reach their peak bone mass. Inadequate calcium and vitamin D at this time can lead to weaker bones.

Gluten-free

Around one in 100 people suffers from coeliac disease and cannot eat food containing gluten (a protein in cereals), but many more people in the UK — some estimates put the figure at 8.5 million — now choose to avoid foods containing gluten.⁷⁵

In the average British diet, grains provide a significant amount of dietary fibre, but gluten-free foods are usually made with refined flours and starches which have very little — so lack of fibre is one of the most common drawbacks with gluten-free eating.

Gluten-free foods are also likely to be low in riboflavin, thiamine and niacin and B12, folate and a number of minerals including iron, zinc, magnesium and calcium.⁷⁶ And there is even evidence that gluten itself may be important for health, with studies confirming it supports the immune system by increasing activity of natural killer cells, and lowering triglycerides, unhealthy fats associated with heart disease.^{77,78}



3

LAST WORD

There is no denying the evidence. The latest National Diet and Nutrition Survey and research by the Health & Food Supplements Information Service confirms that, despite our ready access to nutrient-rich foods, large sections of the UK population have diets that are so low in some important vitamins and minerals they are putting their health at risk.

Professor Philip Calder warns: “The low levels of iron and folate among teenage girls and women of child-bearing age are a major concern and pose a real threat to future generations. Vitamin A is found in so many foods, intakes should never be an issue — but the NDNS confirms gaps across all generations and genders as a result of the nutrient-poor foods that make up our diets.”

Dr Gill Jenkins adds: “There is now overwhelming evidence that fibre is fantastically important for good health, but the NDNS confirms that millions of Britons are not getting enough of this often over-looked nutrient.”

In summary, Dr Emma Derbyshire says: “In fact, there is not a single nutrient or important food group tracked in the NDNS where there are not significant numbers of people falling short of the Lower Reference Nutrient Intake or target recommendation.

“The NDNS data and HSIS survey show that despite massive education campaigns and constant nudges, the vast majority of Britons are still not eating five portions of fruit and vegetables a day, and many are running the risk of deficiencies by excluding entire food groups.

“We know that optimum nutrition protects against a wide range of health problems, ranging from common killers, such as cardiac disease though to minor niggles such as tiredness, dry skin and poor memory.

“So, if diet is not delivering the nutrients you need, it is important to protect yourself by taking a multivitamin supplement to plug nutrient gaps, effectively taking out health insurance, as well as thinking about a top-up of other nutrients such as iron or omega-3s which you may also be lacking.”



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. HSIS is funded by PAGB (Proprietary Association of Great Britain).

For further information or to arrange an interview with an HSIS spokesperson, please contact the HSIS press office HSIS@junglecatsolutions.com or call 020 3600 0228. Out of hours please call 07867 513 361.

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