



VITAMIN D: THE RAPIDLY EMERGING EVIDENCE

WHY WE ALL NEED TO GET VITAMIN D SAVVY URGENTLY



FOREWORD

Nutritionists: **Dr Emma Derbyshire & Dr Pamela Mason;**
GP: **Dr Nisa Aslam & Dr Gill Jenkins**

The signs of vitamin D deficiency were first described in the 1600s and it's almost 100 years since Adolf Windhaus won the 1928 Nobel Prize for Chemistry for discovering vitamin D₃,¹ but a review of the latest evidence by the Health & Food Supplements Information Service (HSIS; www.hsis.org), which has just been published in *The Food and Nutrition Journal*, suggests that there are still enormous gaps in our knowledge of this important nutrient.²

Indeed, the evidence that vitamin D has important health benefits, which extend far beyond bones and teeth, is accumulating so

rapidly that several studies were published while the HSIS research paper was going through the rigorous review process demanded by all leading academic journals.

However, what is clear from the new paper, Vitamin D: The challenge of bridging the gap and the rationale for supplementation, is that the sunshine nutrient, as it is often known, is likely to play a pivotal role in immunity, inflammation, cardiovascular health, brain health and the endocrine system — which itself has multiple impacts in our health and wellbeing through the release and regulation of hormones.

“ **VITAMIN D HAS IMPORTANT HEALTH BENEFITS** WHICH EXTEND FAR BEYOND BONES AND TEETH ”

HSIS GP, Dr Nisa Aslam explains, “Vitamin D receptors are found in many organs and tissues throughout the body, and this suggests the nutrient has a role in driving or regulating multiple functions. This is because receptors are essentially chemical transformers which convert an external energy source into electrical signals that can be relayed around the body.³

“They are chemical messengers which act like relay stations between our body and the external environment. They process vitamins and other nutrients so our bodies can use them and because of the important role they play in our health, most medicines are also designed to home in on specific receptors.”

Dr Gill Jenkins, GP and part of the HSIS expert hub explains, “The fact that vitamin-D receptors are so widely distributed throughout the body is effectively a neon sign alerting us to its potential importance for many aspects of health and disease prevention.

“There is clearly still a lot to learn. But what we do know is that vitamin D matters. We’ve known for a long time that it matters for healthy bones and teeth. We’ve known for some time that it seems to matter for immunity and the risk and progression of autoimmune disease. And now there is a slew of emerging evidence to suggest that vitamin D matters in so many other areas of health and wellness.”



“THERE IS A SLEW OF EMERGING EVIDENCE TO SUGGEST THAT **VITAMIN D MATTERS** IN SO MANY OTHER AREAS OF HEALTH AND WELLNESS”

“ALL THE EVIDENCE POINTS TO **SIGNIFICANT AND WORRYING SHORTFALLS**”

However, while we all know it as the so-called ‘sunshine vitamin’, the latest evidence also reveals how this description of vitamin D could be clouding our judgement, and increasing the risk of worrying shortfalls.

Public Health Nutritionist for HSIS, Dr Emma Derbyshire says, “Very few foods contain vitamin D. It’s found in relatively small quantities in oily fish, liver, butter, eggs and milk as well as in some fortified breakfast cereals and spreads. And data from the National Diet and Nutrition Survey shows that the vast majority of adults do not take a vitamin D supplement.

“There is an assumption that we get most of our vitamin D from exposure to sunlight, but there is actually a lot of debate around how much sunlight is enough. This also fails to address the fact that from October to March there is not enough sunlight in the UK for our skin to produce vitamin D — and this period gets longer the further north you go.”

New real-world research commissioned by HSIS confirms growing public awareness of the importance of vitamin D, with 34% of those surveyed confirming they take a

vitamin D supplement and 26% taking a multivitamin which contains vitamin D.⁴

But there are still worrying gaps. The research poll responses suggest that only one in five (19%) young children are receiving the year-round supplementation recommended by the NHS⁵ Royal College of Paediatrics and Child Health⁶ and every Chief Medical Officer in the UK.⁷ As a result, 81% of young children are not receiving the year-round supplementation recommended.

The National Diet and Nutrition Survey confirms shortfalls across all age groups, with blood tests showing that 2% of children aged four to 10, one in five (19%) adolescents, 16% of working-age adults and 13% of over-65s are deficient in vitamin D.⁸

HSIS Nutritionist Dr Pamela Mason says, “All the evidence points to significant and worrying shortfalls and the need for supplementation to bridge this gap. We know that vitamin D is essential for bone and muscle health and, as we have detailed, there is a growing body of evidence pointing to benefits for the gut, cardiometabolic health and respiratory function.”



1

SHOULD WE
LEVEL UP?

While there is consensus that blood levels of vitamin D below 25nmol/litre are too low and indicate a deficiency, health regulators and scientists can't agree on what the optimal level is, or the amount of vitamin D that is required to achieve it. In some cases, 'official' advice is also inconsistent.

For instance, the UK's Chief Medical Officers advise that all pregnant and breast-feeding women, and anyone over the age of 65 who are not exposed to much sun, should take a daily supplement 10mcg supplement. Unless they are fed a fortified infant formula, a supplement of 7 to 8.5mcg is recommended for children between the age of six months and five years.

But that guidance was issued more than a decade ago, in 2012.^{9,10} In 2016, the Scientific Advisory Committee on Nutrition (SACN), took another look at vitamin D and recommended, "Everyone over one year of age should consume 10mcg of vitamin D daily." From birth to 12 months, infants should get between 8.5 and 10 mcg.¹¹ It also advises that a blood level of less than 25nmol/L constitutes a deficiency.

However, in Ireland, the threshold is 30nmol/L or more and only older adults are advised to top up. In the Nordic Countries everyone aged six months to 74 years is advised to take 10 to 20mcg, depending on their sun exposure, and a minimum blood level of more than 25-30 nmol/L is recommended. For older adults blood levels of 50nmol/L or more are recommended.



A SUPPLEMENT
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YEARS**



The European Union advises that blood concentrations of 50nmol/L or more indicate adequacy and recommends a daily intake of 10mcg for infants in their first year of life and 15mcg for everyone over the age of one.

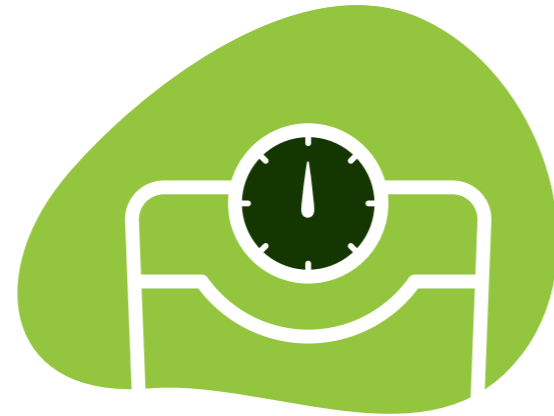
A minimum of 50nmol/L is also recommended in Australia and New Zealand, along with population-wide supplementation ranging from 5mcg to 15mcg depending on age and whether women are pregnant or breastfeeding.

In the United Arab Emirates blood levels of 75 to 125nmol/L are recommended, along with intakes ranging from 10 to 50mcg, depending on age, pregnancy, breastfeeding — and also obesity and metabolic syndrome.

Dr Pamela Mason says, “What’s clear is that the advice is far from clear. Apart from these official guidelines, a number of medical organisations have issued vitamin D guidance for specific issues such as osteoporosis, neurodevelopmental disorders and pregnancy and lactation.

“What’s also interesting, and long overdue, is the fact that some recommendations also flag up obesity as a reason for supplementation. Studies confirm that being overweight or obese dramatically increases the risk of vitamin D deficiency and these individuals require higher intakes of supplementary vitamin D to maintain adequate levels in the blood, where it can be accessed and utilised, compared to people who are a healthy weight.”¹²

This is because vitamin D is lipophilic, or to put it more simply, it loves fat and is drawn to adipose tissue.¹³ This can have a huge impact on the amount of vitamin D that the body can access and use. One study recommended that obese people need two to three times more supplementary vitamin D than someone of a healthy weight, and those who are overweight require 1.5 times more.¹⁴



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Dr Nisa Aslam says, “With millions of children and adults now overweight or obese we really should be factoring this into our advice on supplementation.” The latest Health Survey for England confirms that 25.9% of adults are obese and a further 37.9% are overweight — almost two-thirds in all.¹⁵ In Scotland 67% are overweight or obese,¹⁶ and in Wales 62% of adults are carrying too much weight and a quarter (25%) are so heavy they are considered clinically obese.¹⁷

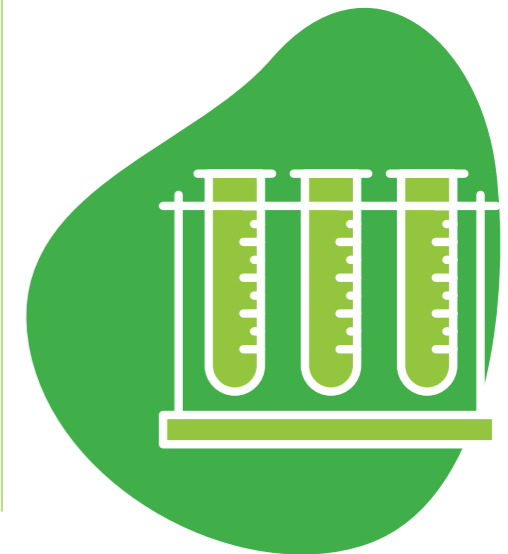
But there are more fundamental failings. Shockingly, consumer research commissioned by HSIS to capture real-world evidence shows that most UK adults are in the dark when it comes to vitamin D and 55% are not aware of the official advice to take a supplement from October to March.¹⁸

Even fewer (30%) are aware of the guidance for babies who are breastfed and two in five (40%) mistakenly believe that diet alone can provide all their vitamin D needs.

A similar number (40%) don’t realise that adequate levels of vitamin D are essential for the absorption of calcium.

Dr Gill Jenkins says, “Given that the same HSIS consumer research also shows that three in five [59%] adults give thought to their bone health this reveals a curious blind spot around vitamin D.”

There are also worrying knowledge gaps around the dose of vitamin D which is recommended during autumn and winter, with only one in five (22%) aware the guidance is to take 10mcg daily. A third (34%) admit they have no idea how much is advised, and more than a quarter (26%) underestimate the dose.





2 CLOUDED JUDGEMENT

Most of our vitamin D is produced as a precursor in the skin in response to sunlight, or more specifically UVB radiation. However, more sun doesn't necessarily equal more vitamin D because synthesis is reduced by sunburn. This precursor of vitamin D is then converted into 25(OH)D in the liver and kidneys, and it is this hormonal form of vitamin D which circulates throughout the body, so it can be accessed and used.¹⁹

Vitamin D production is optimal when the wavelength of UVB radiation is between 290 and 310nm. Synthesis in the skin takes around eight hours and when we have sufficient vitamin D our skin stops producing it.²⁰

But the amount of UVB radiation which reaches the atmosphere, and facilitates this process, depends on the angle of the Earth in relation to the sun. Studies confirm that at 52°N — the latitude which runs through the outer northern suburbs of London²¹ — we cannot produce vitamin D from October to March. And the further north you travel, the longer this winter drought of vitamin D extends.²²

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3

GAPS IN
OUR HEALTH

Dr Gill Jenkins says, “Although it is widely known as the sunshine vitamin, the science around how much vitamin D we actually get from the sun is also far from settled and a major red flag should be the fact that vitamin D deficiency is still prevalent in sunny countries such as Australia.”

A study by researchers at Surrey University found that even in Brazil, which lies across the Equator and Tropic of Capricorn, vitamin D deficiency is a problem.²³ The study concludes, “The findings presented in this paper, indicating that vitamin D insufficiency is prevalent in Brazil, do not support the common assumption that the level of solar radiation in this country ensures the population has adequate vitamin D status.”²⁴

Dr Emma Derbyshire says, “Our ability to produce vitamin D from sunlight is also determined by a host of variables including how much time we spend outdoors, how much we cover up, whether or not we apply a sunscreen, cloud cover, air pollution, our age and our skin type.”

As the new evidence review points out, data from the UK Biobank Cohort confirms that Black and Asian populations are at much higher risk of vitamin D deficiency and South Asian populations have low-levels all year around.

While another study found that one in ten Southern Europeans has vitamin D levels below 25nmol/L — which is close to the threshold that puts them at risk of diseases caused by deficiency. And a third have levels below 50nmol/L, which some experts believe is the minimum required for good health.²⁵

Dr Pamela Mason says, “There is only one thing we can be sure of: sunshine alone will not provide sufficient year-round levels of vitamin D. We also know there are very few dietary sources, so food alone will not cover the shortfall. It is crucial that we look at other strategies to ensure adequate levels of vitamin D and the only way we can be sure of this is supplementation.”



HERE IS ONLY ONE THING WE CAN BE SURE OF: **SUNSHINE ALONE WILL NOT PROVIDE SUFFICIENT YEAR-ROUND LEVELS OF VITAMIN D**



Why we need to get bone health savvy vitamin D is best known for bone health, and it was the bone-deforming disease rickets which first pointed to the importance of sunshine and vitamin D. Rickets became common in children following the industrial revolution that swept across Europe in the 1600s — bringing with it a proliferation of closely built houses, increased pollution from coal burning and a dramatic increase in the time people spent indoors.²⁶

But it wasn't until 1822 that a Polish doctor, Jędrzej Śniadecki, joined the dots and pointed out that rickets was much more common in children living in gloomy inner-city Warsaw than it was in those who lived in the countryside where they were exposed to many hours of sunlight.

Dr Pamela Mason says, “Vitamin D is essential for building healthy bones in children and adolescents, for the consolidation of bone mass in adults and to prevent osteoporosis in later life. Evidence for the importance of vitamin D for healthy bones and teeth is settled science and the only debate which remains is, ‘How much do we need?’.



MANY BRITONS **NEED MUCH MORE OF THIS VITAL NUTRIENT** THAN THEY ARE CURRENTLY GETTING



“All the evidence, from the National Diet and Nutrition Survey, and studies which have looked at vitamin D status, suggests that many Britons need much more of this vital nutrient than they are currently getting. And the implications, for bone health alone, are worrying.”



Osteoporosis is often considered a disease of old age and there is no doubt that risk rises as we get older, but it is estimated that one in five women and 6.7% of men over the age of 50 in the UK have the condition.

More than 3.7 million people are living with osteoporosis and it causes a fragility fracture every minute.²⁷ Analysis of 28 studies which looked at the vitamin D status of more than 61,000 seniors found that those with low levels had more than double the risk of a hip fracture than those with the highest levels.²⁸

Dr Nisa Aslam says, “This brittle bone condition is a common cause of hip fractures in people aged 60 or older, but what is perhaps less widely known is the fact that there is a 21.2% chance of dying within a year of breaking a hip.”²⁹

“What is much harder to quantify is the pain and disability that comes with the condition, but ask any GP and they will tell you, osteoporosis can have a devastating impact on quality of life, and the ability to live independently, so it’s important that we do all we can to prevent it.”

Studies confirm that a daily dose of 20 to 25mcg³⁰ of vitamin D — more than twice the current UK recommendation — combined with an adequate calcium intake can decrease the incidence of fractures in elderly adults who are deficient in vitamin D.^{31,32}

However, it’s not just older people who are at risk. Stress fractures are relatively common among athletes and healthy young adults who undergo tough physical training and a recent study in US military personnel with an average age of 20, showed that low vitamin D status increased their risk of these fractures. Researchers suggested supplementation as a “mitigation strategy” to protect against stress fractures.³³

Another study, which looked at vitamin D status and the bone strength and density of 165 Americans aged 18 to 30 found that 43.6% of participants had vitamin D levels below 50nmol/L and lower levels were closely correlated with poorer bone mass.³⁴

A MASS OF MUSCLE EVIDENCE

The new HSIS evidence review points out that sub-optimal vitamin D status is associated with muscle wasting and poor muscle function, which will also increase the risk of falls and fractures. Dr Emma Derbyshire explains, “The latest thinking is that vitamin D deficiency reduces oxygen consumption in muscle and disrupts mitochondrial function.

“Mitochondria are found in every cell of our body and are essentially nano power stations which generate almost all of the energy needed to fuel the cell’s work. There is still a lot to learn but, given what we do know, it is likely that anything which impairs their function will have multiple negative impacts on health.”³⁵



Studies confirm that people with higher blood concentrations of vitamin D have a stronger hand grip³⁶ — a simple measure which has been described as an “indispensable biomarker for older adults”. This is because handgrip accurately predicts our future risk of death as well as health specifics including bone density, fractures, falls, cognitive impairment, depression, sleep problems, diabetes and quality of life.³⁷

A study published last year, which tracked 9,220 adults aged 45 and older for ten years, concluded, “Handgrip strength and muscle weakness are strongly associated with an increased risk of all-cause and premature mortality in healthy middle-aged and older adults.”³⁸

“STUDIES CONFIRM THAT PEOPLE WITH HIGHER BLOOD CONCENTRATIONS OF VITAMIN D **HAVE A STRONGER HAND GRIP**”



Dr Pamela Mason says, “What is also important to note is that this study was designed to rule out pretty much every other variable including age, sex, physical activity, alcohol consumption, smoking status, education and household income.”

GUT INSTINCTS

There is now a wealth of evidence confirming the important role that gut bacteria have on our health and wellbeing, with studies showing links between our microbiota and a range of health challenges including obesity, diabetes, arterial stiffness, inflammatory bowel disease, psoriatic arthritis and eczema.³⁹

Dr Emma Derbyshire says, “We know there is two-way communication between our gut and our brain, but there is probably a lot we are yet to learn about the role that gut bacteria plays in our physical and mental health. To me, an important clue is the fact that the human genome consists of around 23,000 genes, but the average microbiome encodes for more than three million genes —and every one of these genes is producing metabolites that are likely to influence our health.”⁴⁰

A recent systematic review which looked at 25 different interventional and observational studies found that vitamin D supplementation leads to significant changes in gut bacteria.⁴¹

GRANTING IMMUNITY

Gut bacteria have been shown to influence our immune response, so vitamin D’s ability to modulate our microbiota may, in part, explain how it supports our immune function and ability to deal with respiratory infections.

Dr Gill Jenkins says, “We can all see how the seasonal pattern of winter coughs and colds aligns with reduced sunshine and the inability to produce vitamin D in our skin, and studies confirm that our risk of infections tracks our vitamin D status.”

A large UK study shows that every 10nmol/L increase in circulating vitamin D is associated with a 7% lower risk of infection, as well as improved lung function.⁴² This was confirmed by a 2019 systematic review which found that low levels of vitamin D are associated with an increased risk of both upper and lower respiratory tract infections.⁴³

“ THERE IS NOW A WEALTH OF EVIDENCE CONFIRMING **THE IMPORTANT ROLE THAT GUT BACTERIA HAVE ON OUR HEALTH AND WELLBEING** ”

WORK ON CARDIO

Meta-analysis of 40 studies covering data from more than 650,000 adults found that vitamin D insufficiency increased the overall risk of cardiovascular disease (CVD) by 35% and elevated the risk of death as a result of CVD by 43%.⁴⁴

- The odds of heart failure rose by 38%
- Heart attack by 28%
- Coronary heart disease by 28%

Dr Emma Derbyshire says, “We know that vitamin D helps regulate serum levels of calcium and phosphate, and that both these minerals regulate cardiovascular function and multiple metabolic processes, so it intuitively makes sense that our vitamin D status might influence our risk of cardiovascular and metabolic disease.”^{45,46}

Dr Nisa Aslam says, “Cardiovascular disease accounts for around one in four deaths in the UK and it’s estimated that there are around 7.6 million people living with diseases of the heart and circulation — and an ageing population coupled with rising rates of obesity mean that this number will continue to grow.”⁴⁷

“Anything we can do to reduce this risk, even marginally, is likely to have a significant impact in terms of public health so the potential benefits of improving vitamin D status are very exciting. There is also evidence of a link between low vitamin D and an increased risk of cardiometabolic diseases, such as type-2 diabetes, which again, could have big implications for public health.”⁴⁸

Nine in ten people with diabetes have this form of the disease and there are thought to be 3.8 million people living with type-2 diabetes and a further 850,000 who have it but have not yet been diagnosed.

Dr Gill Jenkins says, “A further 2.4 million people are at increased risk of type-2 diabetes, primarily because of their weight and lifestyle, but again, if ensuring adequate levels of vitamin D reduces this risk, this is potentially a very important public health message.”⁴⁹



CARDIOVASCULAR DISEASE ACCOUNTS FOR AROUND **ONE IN FOUR DEATHS IN THE UK** ”



SLEEP AND MOOD

Dr Pamela Mason says, “Low levels of vitamin D have been linked with poor sleep patterns and an increased risk of depression, increasingly common health challenges which often go hand in hand. Sleep disruption and low mood also align with more serious health challenges including obesity, heart disease and diabetes, so it is important that we look for solutions.”

As one recent evidence review concluded, “Sleep health promotion is an under-recognised public health opportunity with implications for a wide range of critical health outcomes, including cardiovascular disease, obesity, mental health, and neurodegenerative disease.”⁵⁰

Dr Gill Jenkins says, “This can establish a cascade of problems because poor sleep increases the risk of depression, which increases the risk of unhealthy lifestyles, health issues and early death,⁵¹ so any simple no-risk measure — such as improving vitamin D status — that could address this, warrants careful consideration.”

STUDY NOTES

As the evidence review points out, when considering how much vitamin D we need to address specific health problems it’s important to weigh up the design of the different studies.

Whilst findings from RCTs [randomised controlled trials] are often used to infer causation, it is important to consider that epidemiological studies evaluate links across longer time frames, without such large differences in vitamin D intake and can better represent a real-life context.

In summary, Dr Nisa Aslam says, “While there may be debate about the Goldilocks dose and blood serum levels that are ‘just right’ there is no doubt that vitamin D is associated with a wide range of health benefits.”



4 | DIET DOESN'T DO IT

Vitamin D is found in very few foods and the best naturally occurring sources — oily fish, red meat, liver, and eggs — all come from animals, so vegetarians and vegans are at particularly high risk of shortfalls.⁵²

The National Diet and Nutrition Survey does not present data by diet choices, but it does reveal that vitamin D deficiency is an issue across all age groups.

Adolescence is a critical period for consolidating bone mass, but blood analysis confirms that just over a quarter (26%) of children aged 11 to 18 are deficient in vitamin D.

There are also significant shortfalls among working-age adults, with one in six (16%) having blood levels below the minimum 25nmol/L required to avoid deficiency diseases such as rickets and osteomalacia.⁵³ And despite specific advice on the need for supplementation for older adults, the latest NDNS data shows that 13% of over-65s are deficient in vitamin D.

There is also a worrying lack of awareness around the vitamin D recommendations for infants and young children. Consumer

research for HSIS shows that 70% of adults don't realise that infants who are bottle-fed should receive a year-round supplement of 8.5 to 10mcg.⁵⁴ And only one in five is aware that children aged one to four should get a daily top-up of 10mcg.



70% OF ADULTS DON'T REALISE THAT INFANTS WHO ARE BOTTLE FED SHOULD RECEIVE **A YEAR-ROUND SUPPLEMENT OF 8.5 TO 10MCG** ”

Supplementation is essential at all ages because not only do very few foods contain this nutrient, the amounts found in these foods are relatively small. For instance, it would require a 140g portion of baked salmon to provide the recommended daily intake of 10mcg, or more than six eggs a day or around seven tins of tuna.⁵⁵

Dr Emma Derbyshire says, “Some fat spreads, yoghurts, fromage frais and breakfast cereals are also fortified with vitamin D, but these might also be considered to be ‘ultra-processed’ foods, which are currently the subject of much controversy. An unintended consequence of this debate is that some consumers may now actively avoid fortified foods, which makes it even more challenging to maintain adequate levels of vitamin D.”⁵⁶

“THERE IS REALLY ONLY ONE WAY TO ENSURE ADEQUATE INTAKES – AND THAT IS BY TAKING A VITAMIN D SUPPLEMENT”

Perhaps not surprisingly, the latest National Diet and Nutrition Survey shows that average vitamin D intakes from food sources alone were below the reference nutrient intake (RNI) of 10mcg per day in all age groups.

Dr Pamela Mason explains, “The RNI is the amount needed to ensure that the needs of nearly everyone in a particular demographic group are met, and only a fifth to a quarter of children and a quarter to a third of adults are currently meeting this relatively low bar.”⁵⁷

Even when intakes from supplements were included average intakes increased to around 29-40% of the RNI for children and 54% for adults aged 19 to 64 years. Only one demographic achieved the RNI; women aged 65 to 74 who are routinely and regularly advised to take supplementary vitamin D to preserve their bone health.

Dr Emma Derbyshire says, “With vitamin D from sunlight unavailable for at least five months of the year, and even longer in the north of England, Scotland and Northern Ireland, coupled with the multiple challenges around nutritional sources of vitamin D, there is really only one way to ensure adequate intakes – and that is by taking a vitamin D supplement, or a multi-vitamin containing a useful amount of this important nutrient.”

SUPPLEMENTARY EVIDENCE

Dr Pamela Mason says, “At the moment, advice on vitamin D supplementation focuses on groups such as the very young and the elderly, or pregnant or breast-feeding women, who have specific nutrient



needs and are at high risk of deficiency. There is also guidance around the need to top up from October to March when it is impossible to produce vitamin D from sunlight. But consumer research for HSIS shows that the majority of adults (55%) are not aware of the advice to take supplementary vitamin D during autumn and winter, and this rises to two-thirds (67%) among over-65s.

Dr Pamela Mason says, “The HSIS review of the evidence shows there is now a very strong case for all-year-round supplementation, for all age groups. We know that vitamin D is important for multiple aspects of health and wellbeing and encouraging everyone to take a daily 10mcg supplement, or at the very least a multivitamin with a useful amount of vitamin D, is the only realistic way to ensure that all Britons get close to achieving the recommended minimum blood levels of 25nmol/L.”

However, as the HSIS evidence review points out, when considering how much vitamin D we

“THERE IS NOW A VERY STRONG CASE FOR ALL-YEAR-ROUND SUPPLEMENTATION”

need, it's important to weigh up the design and limitations of the different studies looking at vitamin D status and health.

Many experts and some Governments, also believe that the 25nmol/L threshold used in the UK is actually far too low, and we should really be aiming for minimum concentrations of 50nmol/L or more. In some countries and populations, the target serum level is as high as 125nmol/L.

Despite the widespread shortfalls, the UK supplement industry currently has a voluntary upper limit of 75mcg (3000 IU)⁵⁸ – despite the NHS and European regulators advising an upper limit of 100mcg.^{59,60}

Dr Nisa Aslam says, “All the evidence suggests that the 75mcg upper limit is not only unnecessary, it also presents a barrier to addressing the widespread and well-documented shortfalls of vitamin D across all age groups in the UK.”

LAST WORD

Dr Nisa Aslam says, “We have known for centuries that sunlight and vitamin D are essential for healthy bones and more recently we have begun to understand the important role that vitamin D plays in immunity and our ability to resist respiratory infections, in particular.

“Now, as our evidence review details, there is a growing body of evidence to suggest that optimal levels of vitamin D are associated with an even wider range of health and wellbeing benefits and this new data, as well as the NDNS data confirming widespread shortfalls, underline the need to take a fresh look at the current advice on vitamin D supplementation.”

Dr Emma Derbyshire says, “At the moment, official guidance focuses on the importance of vitamin D for infants and young children, older adults, or specific demographic groups and also on plugging gaps during autumn, winter and early spring when we are unable to synthesise the nutrient from sunshine.

“But it is now clear that this is only a small piece of the puzzle. Studies confirming a link between vitamin D status and some of our biggest health challenges, such as cardiovascular and metabolic disease, as well as issues including muscle strength, sleep and mood which have a huge impact on our quality of life.”

“OPTIMAL LEVELS OF VITAMIN D ARE ASSOCIATED WITH **AN EVEN WIDER RANGE OF HEALTH AND WELLBEING BENEFITS**”



Dr Pamela Mason adds; “Given the paltry amounts of vitamin D we can obtain from dietary sources, and the uncertainty about how much we can synthesise from sunlight – even during the height of summer – taking a daily supplement, or a multivitamin with vitamin D, is really the only way to ensure an adequate intake.”

Dr Gill Jenkins notes further, “There is also increasing evidence that being overweight or obese impacts the amount of vitamin D that we need, but while this is being recognised in other countries, it is not currently factored into any of the official advice in the UK – where we all know that a significant proportion of the population is overweight or obese.”

Dr Emma Derbyshire says, “Public health advice should always be based on solid evidence and data, and when it comes to vitamin D, we have a wealth of evidence and data confirming widespread deficiency.

“As the NDNS data and blood analysis shows, there is not a single demographic group where there is not some level of vitamin D deficiency. Plus, the UK threshold for deficiency – 25nmol/L – is low in comparison to many countries. This coupled with an epidemic of obesity – which inhibits the amount of vitamin D circulating in the bloodstream, where is accessible – has serious public health implications for bone health and immunity.”

Dr Nisa Aslam details further, “The science is complex and constantly evolving, but as



our new paper spells out, the importance of vitamin D for health and wellbeing is now beyond doubt. And while there may be an ongoing debate about how much vitamin D we need, the simple answer is that we need more.”

Dr Pamela Mason in summary says, “A sensible first step would be to increase the industry’s voluntary upper limit of vitamin D in supplements from 75mcg to 100mcg. This would align with the latest advice and make it easier for consumers to achieve adequate levels.

“We also need to raise public awareness of the importance of vitamin D for all age groups and the significant challenges around achieving adequate levels – not just during the autumn and winter months when it is impossible to synthesise from sunlight – but all year round.”

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