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COGNITIVE CONTROL

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As we bring to a close a year that will go down in history as one of the most unpredictable and challenging, and one that brought our collective health into sharp focus, it's incredible to think of all that has happened in less than 12 months; the arrival of a novel virus never seen before on such a scale, a total shutdown of our country (and our lives) as we knew it, living under restrictions, health and financial worries, and then the arrival of a vaccine in 10 months.

The effects of the Covid-19 pandemic

have been stark, both in the tragic deaths of all those who have succumbed to it, but also in relation to the long-term health effects – physical and mental – that will be experienced for some time to come. But on the flip side, all the suggestions are that because of people's concern around the threat to their

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health, wellbeing is becoming a focus for them. We certainly see that in a new report from EIT Food that 49 per cent of European consumers say they aim to eat healthier since the pandemic.

And we are seeing the importance of good nutrition reach the highest echelons of our Government, with Health Minister, Matt Hancock, announcing that vulnerable people in England will be offered free vitamin D supplements. Has the Covid-19 pandemic finally triggered a shift in how health officials view the necessity of supplementing with certain nutrients? You can read the story by **clicking here**.

And in this issue of *Nutrition I-Mag*, we have a host of important health issues covered by our experts, including a detailed look at cognitive health and the issues facing the UK at the moment, advice on the best preventative nutritional care in relation to the heart, and an in-depth guide to SIBO and the correct way to address it in-clinic.

All that remains for the team at *Nutrition I-Mag* to say is we wish all our readers a healthy and happy Christmas, and continued success for your nutritional studies in 2021.

RACHEL SYMONDS, EDITOR



NUTRITION I-MAG, Target Publishing Limited, The Old Dairy, Hudsons Farm, Fieldgate Lane, Ugley Green, Bishops Stortford CM22 6HJ t: 01279 816300 e: info@targetpublishing.com www.nutritionimag.com



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Natural Healthcare College

Meet The Team

EDITOR Rachel Symonds CONTRIBUTORS Frank Brogan, Paul Hembery, Joanna Dziedzic

SALES & PUBLISHING DIRECTOR Ruth Gilmour e: ruth.gilmour@targetpublishing.com KEY ACCOUNTS DIRECTOR Abigail Morris e: abigail.morris@targetpublishing.com SALES MANAGER Maria Francis e: maria.francis@targetpublishing.com DESIGN/PRODUCTION Leann Boreham e: leann.boreham@targetpublishing.com Annabelle Duggan e: annabelle.duggan@targetpublishing.com

MARKETING DIRECTOR James Rix e: james.rix@targetpublishing.com ACCOUNTS Lorraine Evans e: accounts@targetpublishing.com MANAGING DIRECTOR David Cann e: info@targetpublishing.com

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RECIPES A collection of good for you recipes that raise money for a good cause



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INGREDIENT FOCUS

The importance of selenium for a range of health areas

NUTRITION I-MAG GIVEAWAYS

OUR CONTRIBUTORS

Each issue, Nutrition I-Mag enjoys contributions from many leading authorities in the nutrition world. This issue, our writers include:



Justine Stenger

Justine Stenger is a certified functional medicine health coach, a certified therapeutic chef, functional medicine trained through the Institute for Functional Medicine, and a qualified Bredesen practitioner. She specialises in reversing cognitive decline, mast cell activation syndrome, and autoimmune disease. Justine is a Nutritional Consultant to BodyBio.



Joanna Dziedzic

Joanna Dziedzic is a qualified Nutritional Therapist with experience in high-end consultancy, training other healthcare professionals and clinical practice. She has a passion and interest in natural approaches to supporting complex health issues and improving vitality and wellbeing. Joanna is a Business Development Manager for Pure Encapsulations UK, a leading nutritional health science company.



Hania Opienski

Hania Opienski is a Mycotherapy Specialist Consultant for Hifas da Terra, UK and Ireland. Using a synergy of natural Eastern, Western, and Energy Medicine, she draws on her extensive training and experience in naturopathy, nutrition, Traditional Chinese Medicine, life alignment healing, coaching, and mycotherapy. She is a passionate educator and advocate of providing clients with the information and understanding to empower them to take responsibility for their health and wellbeing via their diet, energy management, mindset, and lifestyle choices.



Aidan Goggins

Aidan Goggins, BPharm, MSc NutrMed is a Medical Nutritionist and awardwinning, *Sunday Times* and international best bestselling author, whose work has been translated into 17 different languages. Listed as one of the most influential individuals in the UK food industry, Aidan runs a highly advanced, integrated, nutritional medicine clinic in London. Aidan has a special interest in nutrition for enhancing performance and his work has underpinned the success of many world elite athletes. He is a member of FutureYou Cambridge Advisory Board



Patrick Holford

Patrick Holford is a nutritionist, author and leading commentator on natural health. He founded the Institute of Optimum Nutrition in 1984, and is the author of over 37 books, translated into over 20 languages, including *The Optimum Nutrition Bible* and his new book, *Optimum Nutrition for Vegans*.



Karen Jones

Karen Jones BSc, BA, DipCNM, CNHC, mBANT, is a Registered Nutritional Therapist, practicing in London and specialising in gut health. After completing her diploma at CNM in 2018, she studied the research on the microbiome in a study group under the guidance of Adam Greer (senior lecturer at CNM) for nine months. Karen also provides practitioner support for Microbiome Labs and Enzyme Science brands in the UK.

News Bites

A round-up of the news from the natural health industry.

VACCINES TASKFORCE PRAISED FOR DECISIVE PACE TO SEE UK ROLL OUT COVID-19 VACCINE

s the first Covid-19 vaccines were administered this month, those behind the rollout have been praised for working decisively and at great pace.

The Government published a report highlighting the work and achievements of its Vaccines Taskforce (VTF), six months after it was set up to help in the fight against Covid-19.

The VTF was established in April 2020 by the Government's Chief Scientific Advisor, Sir Patrick Vallance, to drive forward, expedite and co-ordinate efforts to ensure the UK population would have access to a clinically safe and effective vaccine against Covid-19. Kate Bingham was appointed in May 2020 as Chair.

The independent review, by Sir Richard Sykes, Chair of the Royal Institution and former Chair at Imperial College Healthcare NHS Foundation Trust, found the VTF acted decisively and at great pace in the face of the pandemic to secure access to 357m doses of the most promising Covid-19 vaccines for the UK.

Key successes include the creation of the world's first citizen registry of over 360,000 volunteers able to rapidly join vaccine trials, the pioneering of human challenge studies to accelerate future vaccine development and strategic investment to enhance the UK's vaccine research and manufacturing infrastructure, including flexible manufacturing capability at sites at Harwell, Braintree and Livingston.

Commenting on the day that the Pfizer-BioNTech vaccine began being administered to the most vulnerable people, Prime Minister, Boris Johnson, said: "The approval of the Pfizer-BioNTech vaccine for use in the UK marks a momentous step in our fight against Covid-19. I am hugely grateful for the hard work and dedication of the Vaccine Taskforce, under Kate Bingham's leadership, which has brought us to this point in challenging circumstances, representing the best the Government and civil service can do – working with businesses, experts and the public to tackle a common problem at incredible pace. The country owes them a debt of gratitude. But we still have some way to go and everyone needs to



keep following the rules to keep the virus under control."

Business Secretary, Alok Sharma, added: "Thanks to Kate Bingham and her team, we were the first country to sign a deal with Pfizer/ BioNTech, have secured more doses per head of population than almost any other country, and built a vaccine manufacturing base from scratch to strengthen our resilience to respond to Covid-19 and to future pandemics. Our country owes every single person involved in this national effort a huge debt of gratitude."

The approval of the vaccine from the Medicines and Healthcare products Regulatory Agency (MHRA) was made with advice from the Commission on Human Medicines (CHM), the Government's independent expert scientific advisory body. A dedicated team of MHRA scientists and clinicians carried out what was described as a rigorous, scientific and detailed review of all the available data, starting in October 2020. This was done using a regulatory process known as a 'rolling review', which can be used to complete the assessment of a promising medicine or vaccine during a public health emergency in the shortest time possible. This is done as the packages of data become available from ongoing studies on a staggered basis

MHRA Chief Executive, Dr June Raine, commented: "We have carried out a rigorous scientific assessment of all the available evidence of quality, safety and effectiveness. The public's safety has always been at the forefront of our minds – safety is our watchword. I'm really pleased to say that the UK is now one step closer to providing a safe and effective vaccine to help in the fight against Covid-19 – a virus that has affected each and every one of us in some way – and in helping to save lives."

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News that Government will make vitamin D free to vulnerable welcomed

The announcement that Government is to offer free vitamin D supplements to the vulnerable in England has been welcomed by the natural health industry. The Government announced that at-risk groups would receive a free winter supply of vitamin D, with 2.7m vulnerable individuals in England to benefit. Deliveries will be made to clinically extremely vulnerable and care home residents, with all care homes automatically receiving a provision for their residents, while individuals on the clinically extremely vulnerable list will receive a letter inviting them to opt in for a supply to be delivered directly to their homes. Deliveries will be free of charge, starting in January, and will provide four months' worth of supplements to last people through the winter months.

Secretary of State for Health and Social Care, Matt Hancock, commented: "Because of the incredible sacrifices made by the British people to control the virus, many of us have spent more time indoors this year and could be deficient in vitamin D. The Government is taking action to ensure vulnerable individuals can access a free supply to last them through the darker winter months. This will support their general health, keep their bones and muscles healthy and crucially, reduce the pressure on our NHS.

"A number of studies indicate vitamin D might have a positive impact in protecting against Covid-19. I have asked NICE and PHE to re-review the existing evidence on the link between Covid-19 and vitamin D to ensure we explore every potential opportunity to beat this virus." Dr Alison Tedstone, Chief Nutritionist at Public Health England, added: "We advise that everyone, particularly the elderly, those who don't get outside and those with dark skin, takes a vitamin D supplement containing 10mcg (400IU) every day. This year, the advice is more important than ever with more people spending more time inside, which is why the Government will be helping the clinically extremely vulnerable to get vitamin D."

The Department of Health and Social Care (DHSC) says it will provide further information and guidance for all nursing and residential care home providers in the coming weeks.

Following the announcement, Graham Keen, Executive Director of the Health Food Manufacturers' Association (HFMA), commented: "We warmly welcome this news, having been in discussions with the Department of Health for several weeks about extending the supply of vitamin D supplements to at-risk groups. At a recent meeting with the Public Health Minister, we were able to present the latest research on vitamin D and reassure authorities that the health food industry could deliver this volume of vitamin D at the highest quality."

Dr Michele Sadler, Scientific Advisor to the HFMA, continued: "Vitamin D is an essential nutrient known for decades to help support the health of the bones and muscles. It is also known that vitamin D has a positive role in immune function, and that deficiency might compromise immune health. This is pivotal at a time when protecting public health is paramount."

Report raises concern at nutrient deficiency for those adopting plant-based diets

With the rise in plant-based diets, an influential group of doctors and nutrition professionals have raised concern it could be leading to worrying health consequences caused by a lack of vitamins, minerals and omega 3 fats.

The Health and Food Supplements Information Service (HSIS) report, *Plant Based Diets – Nutritional Challenges and Future Health Worries – An A-Z Analysis,* reviewed data from 17,262 people. It looked at the growing trend for plant-based diets and how this is impacting nutrient intakes, using data from published studies and an omnibus poll.

The report found that people on plant-based diets, vegans and vegetarians are typically at risk of dietary shortfalls for optimal wellbeing and health, as well as undermining their micronutrient status.

The HSIS report also revealed that a quarter of vegans and vegetarians say they had been diagnosed with a nutrient deficiency at some stage, mostly related to iron or vitamin D. Hints of dietary problems were evident in the study, with a quarter of people experiencing tiredness even after a good night's sleep, and a fifth reporting depression. Low levels of B vitamins have been linked with these issues. One quarter (25 per cent) report having dry skin, while one in 10 complained of hair loss or brittle nails. Vitamin A, zinc and selenium are all essential for the integrity of the hair and nails, and there are lower levels of these nutrients in plant-based diets.

One of the authors of the report, GP, Dr Nisa Aslam, commented: "The HSIS research found that six in 10 do not examine their health needs before switching to plant-based diets. Busy lifestyles can mean a reliance on ready meals and takeaways as more than four in 10 report eating these at least twice a week. Since these quick and easy options are generally less nutritious – as well as containing more fat, calories and salt than home-cooked meals – today's generation of vegans, vegetarians and those consuming plant-based diets are not getting the maximum health benefit from their new diets.

"Awareness of nutrient shortfalls is also very low, with fewer than a fifth of plant-based adherents, according to the HSIS data, identifying vitamin B12 as an issue, and no-one name-checked vitamin D, despite the fact that nearly all major dietary sources of the 'sunshine vitamin' are animal or fish based. Awareness of zinc, iodine and selenium – other nutrients that are hard to obtain on plant-based diets – is almost non-existent. That's why taking a multivitamin and multimineral supplement is so vital."

Study finds two in three people concerned they lack vitamin D

Two in three consumers are concerned they are not getting enough vitamin D, according to new research from Lycored.

Lycored surveyed 500 physically active consumers in the US, Australia and New Zealand. Two thirds (66 per cent) believed they might not be getting enough vitamin D as a result of spending more time indoors because of Coronavirus. This concern was particularly high among millennials, with three quarters (74 per cent) of those aged 25-34 worried about vitamin D deficiency.

The findings are in line with social listening research indicating a sharp increase in consumer interest in vitamin D; mentions of the micronutrient in US social media increased by 181 per cent between September 2019 and September 2020, when it was the most mentioned vitamin. And in the UK, where people are now advised to take 10mcg per day, there was a 20 per cent increase in new product launches containing vitamin D between 2019 and 2020.

Christiane Lippert, Global Product Manager, Vitamins and

Supplement company sold in management buyout

It has been announced that Sweet Cures has been acquired by members of the management team.

The York-based company has been bought by a new company – Sweet Cures Limited – led by the management team, Bryan Sun and Dave Smith, who have both worked closely with company founder, Anna Sawkins, for more than 12 years.

As part of the deal, Anna retains a stake in the business and will continue to work in consultation with the new management as they continue the business's commitment to quality supplements and excellent customer service, while also looking to add to the Sweet Cures' range. The business specialises in products derived from healthy and essential sugars, which includes its signature Waterfall D-Mannose product to support bladder health and distributed throughout the world.

The management buyout was completed with support from

Delivery Systems at Lycored, explained: "Of course the Coronavirus pandemic has had a huge impact on vitamin and supplement markets and one of the most obvious trends has been increased interest in vitamin D. Our research supports the case that this is largely a result of concern about the effects of spending more time indoors. Clearly, many sun-deprived consumers are looking to supplements, and this demand is likely to increase in the near future, especially in countries entering the winter months."



banking partner, Louise Duffy, and corporate solicitor, Stephanie Brown, at leading independent commercial law firm, Muckle LLP.

Bryan, Sweet Cures Director, commented: "Anna has done a fantastic job of building the business and the new company is committed to maintaining and building on the excellent standards already established. At the same time, we have plans to fulfil our ambitions of expanding the business, following the example of other natural remedy businesses such as Holland & Barrett and iHerb, which both grew from small product ranges. We are looking forward to developing more options for our customers and will continue to provide the very best products and the same premium service, whilst aiming to make our customers' experience even better as the business grows."



In Research

Nutrition I-Mag rounds up the latest research studies in the nutrition world.



Research partnership to assess effect of vitamin K2 deficiency in Covid patients

research partnership has announced a new project to investigate severe vitamin K deficiency in Covid-19 patients. Nattopharma, which makes the vitamin K2 ingredient, MenaQ7, and the Cardiovascular Research Institute Maastricht (CARIM) at Masstricht University has confirmed it has renewed a long-standing vitamin K2 research partnership. This renewed commitment will kick off with a research project that aims to

venty severe vitamining denoted by in Covid-19 patients and to demonstrate that vitamining may provide a nover solution for optimising vascular health.

A recent significant discovery linked a better vitamin K-status in Covid-19 patients to better outcomes and NattoPharma says it is excited to support this new research project that will further explore these findings, examining the severity of vitamin K deficiency in Covid-19 patients and investigating the role of vitamin K2 for vascular health protection in a post-Covid-19 world.

Professor Leon Schurgers, Professor of Biochemistry of Vascular Calcification and Vice-Chair of Biochemistry at

CARIM, commented: "The work conducted in collaboration with NattoPharma will provide further research into the role of vitamin K2 concerning calcium metabolism, impacting various aspects of our health. There is great potential in learning how these mechanisms impact cardiovascular health, but also the implications for other systems, such as bone, cartilage, brain, and pulmonary health.

"The first study represented an amazing finding, linking poor vitamin K status on Covid patients with poor prognosis, while we do not suggest vitamin N2 is a treatment of Covid-19, we expect this next stage of research may confirm that vitamin K2 could provide a novel solution for optimising vascular health. Vascular health is important as this system needs to supply and support other organs, thereby improving outcomes for patients with comorbidities."

NattoPharma CEO Kjetil Ramsøy, added: "The discoveries from research continue to confirm that an adequate level of K2 guides calcium to where you need it – in your bones and teeth, and away from your arteries and blood vessels where calcification makes them stiff."



Study aims to establish sleep programme for those affected by Covid-19

People who have experienced poor sleep during the Covid-19 pandemic are being invited to take part in a study run by sleep experts at Northumbria University.

A recent review of Covid-19 sleep research studies, which encompassed more than 50,000 people from 13 countries, indicates that around 40 per cent have experienced sleep problems caused by the pandemic. Meanwhile, approximately three-quarters of Covid-19 patients have experienced sleep disruption.

However, psychologists from Northumbria Sleep Research (NSR) believe that by intervening early, short-term sleep disruption can be stopped. In turn, they say this is likely to prevent short-term sleep disturbance from becoming a long-term problem.

To investigate this, NSR has launched a study which uses an online treatment, in the form of sleep education, to try and treat short-term sleep problems in people who have recently reported having poor sleep. This involves participants being provided with information which suggests ways in which they can change their behaviour to avoid poor sleep from becoming a longer-term problem.

Academics are seeking those who have had a problem sleeping recently – within the last two weeks to three months. Additionally, the team are looking for 'good sleepers' – those who do not report having problems with their sleep, because they also aim to understand if this intervention can prevent sleep problems from happening in the first place.

UK research suggests biomarkers could predict future health

New research from the University of East Anglia has found that blood tests for biomarkers such as cholesterol and inflammation could predict whether a person will experience disability in five years.

According to the university, the new study shows how people's biological health can predict disability and healthcare demand in five years' time, with the researchers also finding that people on higher-incomes were more likely to seek GP appointments and outpatient treatments for their medical problems – with evidence of pro-rich inequity across all types of health service use.

Dr Apostolos Davillas, from UEA's Norwich Medical School, commented: "We know that the poorest people in England miss out on more than a decade of good health compared with the richest. We wanted to find out more about the links between people's social status and their future health – and see whether blood tests could predict future disability and use of healthcare services."

The researchers studied blood biomarkers from 5,286 participants involved in Understanding Society, the UK Household Longitudinal Study. They looked at factors such as cholesterol, liver and kidney function, and inflammation. They also looked at measures of obesity, grip strength, resting heart rate, blood pressure, and lung function among the participants.

Dr Davillas advised: "What we found is that underlying

biomarker differences are linked with future disability – and that we could actually predict people's level of disability in five years' time, based on the biomarkers in their blood. We also found that people's biological health is linked with future demand on healthcare services, such as GP and outpatient consultations, as well as time spent in hospital.

"We tried to investigate the mechanism for why this happens and found that people with impaired biological health may develop disability in five years' time – resulting in increased healthcare and social needs."

The team say the work has important policy implications, particularly for screening programmes and prevention strategies.

Dr Davillas added: "We found that the markers which matter most for disability progression are associated with lung function, grip strength, obesity, anaemia, stress-related hormones and liver function. Indicators such as blood pressure and cholesterol, which are the current focus of public health screening programs, are less useful as predictors of disability. The NHS England Health Check program mainly offers blood pressure, cholesterol tests and BMI measurements every five years to those aged 40-74. But our research shows that a broader set of blood-based biomarkers should be considered for public health screening programmes."

'Biomarkers, disability and health care demand' is published in the journal, *Economics & Human Biology*.



Study finds age is not a barrier to losing weight

Researchers have found that obese people in the older age group can still lose the same amount of weight as younger people.

The University of Warwick-led study conducted at University Hospitals Coventry and Warwickshire (UHCW) aimed to dispel myths about the effectiveness of weight loss in older people and concluded that lifestyle changes to manage weight loss are effective in reducing obesity, regardless o age.

The findings are based on analysis of patient records from a hospital-based obesity service and are reported in the journal, *Clinical Endocrinology*. This retrospective study was conducted at the Warwickshire Institute for the Study of Diabetes, Endocrinology and Metabolism (WISDEM) at UHCW. The researchers randomly selected 242 patients who attended the WISDEM-based obesity service between 2005 and 2016 and compared two groups (those aged under 60 years and those aged between 60 and 78 years) for the weight loss that they achieved during their time within the service.

All patients had their body weight measured both before and after lifestyle interventions administered and coordinated within the WISDEM-based obesity service, and the percentage reduction in body weight calculated across both groups. When compared, the two groups were equivalent statistically, with those aged 60 years and over on average reducing their body weight by 7.3 per cent compared with a body weight reduction of 6.9 per cent in those aged under 60 years. Both groups spent a similar amount of time within the obesity service, on average, 33.6 months for those 60 and over, and 41.5 months for those younger than 60 years.

The hospital-based programme used only lifestyle-based changes tailored to each individual patient, focusing on dietary changes, psychological support and encouragement of physical activity. Most of the patients referred to the obesity service were morbidly obese, with BMIs typically over 40Kgm-2.

Lead author, Dr Thomas Barber, of Warwick Medical School at the University of Warwick, explained: "Service providers and policymakers should appreciate the importance of weight loss in older people with obesity, for the maintenance of health and wellbeing, and the facilitation of healthy ageing. Furthermore, age per se should not contribute towards clinical decisions regarding the implementation of lifestyle management of older people.

"Age should be no barrier to lifestyle management of obesity. Rather than putting up barriers to older people accessing weight loss programmes, we should be proactively facilitating that process. To do otherwise would risk further and unnecessary neglect of older people through societal ageist misconceptions."

Researchers establish fatty acid reference intakes in pregnancy

A new study has suggested an ideal intake of fatty acids for pregnant women.

Writing in the journal, *Nutrients*, the researchers explained that there is growing interest in determining fatty acid reference intervals from a pregnancy cohort, especially considering the lack of reference values for pregnant women in literature and the generalised misconception of equating reference intervals for non-pregnant women as equivalent to pregnant women.

They explained that seafood and supplements are important dietary sources for the omega-3 long-chain polyunsaturated fatty acids (ω -3 LCPUFA), such as eicosapentaenoic acid (EPA, 20:5 ω -3), docosapentaenoic acid (DPA, 22:55 ω -3), and docosahexaenoic acid (DHA, 22:6 ω -3).

The study, which focused on fatty acid status, suggests reference values and cut-offs for fatty acids in red blood cells (RBC) from pregnant women. This was done using an electronic food frequency questionnaire (e-FFQ), which mapped the dietary habits of participants, while gas chromatography was used to determine the fatty acid levels in RBC. The association between e-FFQ variables and fatty acid concentrations was established using a principal component analysis (PCA).

They found that 21.9 per cent of participants reported eating seafood as dinner, according to the Norwegian recommendations, and they added in their diet as well a high percentage (76.9 per cent) intake of ω -3 supplements. The concentration levels of fatty acids in RBC were in agreement with those reported in similar populations from different countries.

The researchers explained: "The reference interval 2.5/97.5

percentiles for EPA, DPA, DHA were 0.23/2.12, 0.56/2.80, 3.76/10.12 in relative concentration units (%), and 5.99/51.25, 11.08/61.97, 64.25/218.08 in absolute concentration units (μ g/g), respectively. To the best of our knowledge, this is the first PCA study reporting a direct association between ω -3 LCPUFA and intake of seafood and ω -3 supplements in a pregnancy cohort."

In other omega 3 news, researchers have examined its importance in young people and their mental health.

The researchers, also writing in *Nutrients*, explained that current meta-analyses have identified EPA as potentially more effective than DHA and that an especially vulnerable subgroup that might benefit from these beneficial effects are depressed youths.

And so, they examined associations between red blood cell (RBC) DHA and EPA levels and depression severity and verbal memory performance in a sample of 107 moderately (n = 63) and severely (n = 44) depressed youths. The findings showed that youths with high RBC EPA levels had steeper learning curves compared to those with moderate or low RBC EPA levels. No associations between RBC DHA levels or depression severity and verbal memory performance were observed.

In conclusion, they commented: "Our results further confirm previous findings indicating a more important role of EPA compared to DHA in relation to cognitive functioning. Future research should further investigate the differential role of EPA and DHA concerning cognitive functioning in depressed youths. Evidence supporting beneficial supplementation effects could potentially establish a recommendation for a natural and easily accessible intervention for cognitive improvement or remission."

New to market

Nutrition I-Mag brings you the latest product developments in the nutrition world.

Superfood brand launches moringa into capsules

As demand increases for moringa products, Aduna has announced the launch of a new capsule format.

The Africa-inspired health food brand has unveiled organic Moringa Capsules, which contain 1500mg of Aduna's organic moringa leaf powder per serving and designed to be a more convenient format for consumers seeking the health benefits of moringa.

The moringa oleifera tree, native to Africa

and India, is known as the 'miracle tree' thanks to its medicinal properties. The leaves are packed with immune-boosting iron, calcium, vitamins A, E, and K, protein, fibre, antioxidants and phytochemicals.

ORINGA

1500MG PER SERVING

Available in a bottle of 180 capsules (two months' supply), each vegan capsule contains 500mg of Aduna's organic Moringa Superleaf Powder.

Andrew Hunt, CEO and Co-Founder of Aduna, commented: "Preventative health is now top of mind for consumers as a result of Covid-19. Moringa is one of the planet's most nutrient-dense plants – a natural multivitamin – and we are experiencing high demand for it. Our new Moringa Capsules are aimed at consumers who may not have the time to make a daily green juice or smoothie but still want to get the exceptional nutritional benefits."

Folic acid in spray form developed

BetterYou has evolved its oral spray offering with the creation of a new folic acid supplement.

The natural health brand has launched Folic Acid Oral Spray, utilising innovative oral spray technology, which is proven to be just as effective as capsules to deliver nutrients directly into the bloodstream.

Critical in pregnancy, a 2018 study carried out on behalf of Public Health England and the Food Standards Agency revealed as many as 91 per cent of women of childbearing age in the UK are at an increased risk of a NTD affected pregnancy, due to a folic acid deficiency. Furthermore, a trial undertaken by the Medical Research Council found that folic acid supplementation had a 72 per cent protective effect against NTDs.

BetterYou's spray utilises a vegan-friendly, biologically active form of folate – known as methylfolate – providing an effective and convenient alternative

to folic acid in a daily oral spray. Methylfolate is not only useful for those with folate metabolism disorders such as MTHFR gene mutation, it also ensures there is no unmetabolised folic acid circulating in the body, unlike the synthetic form, which can be unused, leaving the body through urine.

GUT SUPPORT WITH NEW LAUNCH

Roots of Kimchi is a new UK-made brand launching to a British audience.

The company makes authentic Korean kimchi that is certified organic, gluten-free and vegan.

Produced in small batches by a team of British and Korean entrepreneurs in the UK, Roots of Kimchi comes in four distinctive variants: Organic Vegan Cabbage Kimchi, Organic Vegan Mooli Kimchi, Organic Mooli Kimchi for Kids, and Organic Parsnips & Carrots Kimchi.

Roots of Kimchi is the brainchild of Midlandsbased entrepreneur, Robert Peacock, and Koreanborn chef, Seo, who identified that there was a gap for a genuinely authentic organic Korean kimchi product in the UK market. Julia Davies, Nutritional Therapist and Consultant to Roots of Kimchi, commented: "I often recommend kimchi to my clients as a way of introducing wholesome, nutritious vegetables to their regime, and because the positive impact of kimchi on the gut and the immune system is so profound. Gut health is more important than ever these days and the market really needed an organic range of authentic kimchi. It's fantastic



includes kimchi for children, too.

the range



CBD BRAND CREATES EDIBLE HEMP POWDER

Hatcha has a new addition to the CBD market with the launch of a new edible hemp powder. Made from combination of

combination of the finest parts of the cannabis plant milled into a fine powder, it is designed to be used in baking

or drinks such as



smoothies for an everyday natural boost.

The powder, available in the UK through CBD One, contains naturally high levels of CBD and CBDa, as well as many other cannabis plant compounds, creating an entourage effect for users.

CBD One Director, Nick Tofalos, explained: "We talk a lot about the entourage effect playing such an important role in the potency of cannabis-based products and on this front, Hatcha is unrivalled. The most effective CBD oils on the market are those that use potent, full-spectrum extracts because there is a known synergy between the many different cannabinoids and terpenes.

"The more that is taken out of a CBD oil, the less effective they seem to become. Hatcha takes things to another level because this isn't just an extract – it is the whole plant in all its glory. In fact, our farmers estimate there are hundreds of active compounds inside."

BRINGING THE EDUCATION TO YOU

We bring you the latest news from our recent virtual IHCAN Conference.

ith in-person education still paused, the IHCAN Conferences returned for another virtual event following the success of the first in September. The second virtual event was equally well received, with 726 tickets sold and, from live feedback posted in the live chat box, the speakers delivered expert talks with plenty of points to take away and use in practice.

The day began with a talk from mindfulness expert, Katie Sheen DipION, PGCE, MA (Education), who recently featured in *IHCAN* magazine's In Practice feature.

Katie spoke about 'What is mindfulness?' and explored how it can embody self-care, redirect negative thought patterns, tame your inner critic and how practitioners can incorporate self-care, not just into their clients' lives, but theirs too.

Next up was headline speaker, Dr Alessio Fasano, M.D. Dr

Fasano heads up the world-famous Centre for Coeliac Research and Treatment at Massachusetts General Hospital, where he is also Director of the Mucosal Immunology and Biology Research Centre. He is a Harvard Medical School visiting professor.

Delegates enjoyed two one-hour sessions from Dr Fasano with his talk, 'The Healing Power of Nutrition: How Diet Can Reshape Gut Microbiome and Influence the Balance Between Health and Disease'.

The final speaker was IHCAN Conference favourite, Tom O'Bryan, DC, CCN, DACBN. Tom, who spoke earlier this year at the first and only in-person IHCAN Conference of 2020, finished the day with his talk, 'The Canary's Song', which explained how chronic inflammation will often manifest in the brain before it's displayed anywhere else. He showed practitioners how to recognise this in clients and gave clinical takeaways they could use straight away.

Just some of the comments from delegates taken from the evaluation form included, 'Thank you so much for the hard work in putting it together. I found the whole thing so informative – I've gone away with a huge list of things to further research for both personal and professional use,'I found the event to be excellent and I was happily surprised that it was easy to follow along from home, online', and 'I find the live virtual format easy to engage with and hope this remains as a feature once live events return'.

If you missed out on the event, you can catch up with the downloads, which include all the video recordings, the presentation PDFs and five CPD hours. Visit www.ihcanconferences.co.uk/virtualevent for more information and to buy the recording.

CONFERENCE SUCCESS

- 726 tickets sold**.
- 100 per cent would attend another virtual IHCAN Conference*.
- 100 per cent found the event platform easy to use*.
- 100 per cent rated the event excellent*.
- 9.5/10 average score out of 10**.
- Six hours 35 minutes average time spent in the event**.
- ** Statistics taken from the event platform
- * Statistics from the post-event evaluation form as at 16/11/2020





CONFERENCE CATCH-UP

Exclusive to *Nutrition I-Mag* readers, watch Dr Dietrich Klinghardt's breakout session from the IHCAN Conferences Virtual Event, Autonomic Response Testing A.R.T. ®: the most reliable diagnostic technique.



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Nutrition and the cognitive connection

The Covid-19 pandemic has had many health consequences, one of them being its effect on our brain and mental health. And with reports showing our collective diets have been less than desirable, how much of an effect can this have on our cognition? Nutrition experts discuss.

he brain is a complex organ, and it seems our modern lifestyles aren't doing a great deal to nourish it. Data shows that not only are cases of Alzheimer's disease on the rise, but with life expectancy making advances, greater numbers of people are experiencing mild cognitive impairment (MCI). And that's before we consider the mental health aspect of the brain, and the huge rise in incidence of disorders.

What's also clear is the past year has been challenging for many people, with reports of anxiety and depression rising, and people's nutrition being less than ideal. So, what does this mean for our collective brain health? And what nutritional factors need to be considered when it comes to addressing cognitive function?

Addressing the rise in cognitive issues, Catherine Gorman, Nutritional Therapist and Health Coach at Good Health Naturally, commented: "Mild cognitive impairment (MCI) is believed to affect between 10-20 per cent of people aged over 65. Symptoms include forgetfulness, poor problem solving, inability to find the right words. But, unlike dementia, these difficulties tend not to get in the way of day-to-day life. Alzheimer's disease is the most common form of dementia in UK. It is a disease of the brain, causing problems with memory, confusion, mood and behaviour changes. Symptoms usually get worse over time. Other forms of dementia include vascular, Parkinson's, and Huntington's.

"There are 850,000 people with dementia in the UK, the number is expected to exceed a million by 2025. Alzheimer's disease accounts for 70 per cent of all cases. In 2015, dementia overtook heart disease and stroke as the UK's biggest cause of death. Age is the biggest factor, we are living longer, so the number of people developing dementia is increasing. It is estimated it affects one in 14 people aged over 65 and one in six over the age of 80. Women are at the epicentre of the Alzheimer's epidemic, 65 per cent of patients and 60 per cent of caregivers are women. Indeed, a woman's chance of developing Alzheimer's disease is now greater than her chance of developing breast cancer." Hania Opienski, Mycotherapy Specialist Consultant for Hifas da Terra UK, agreed that cases appear to be rising, adding: "I think this is due to a number of factors, most commonly diet and lifestyle related. This includes the increased intake of processed food (particularly refined carbohydrates) and pharmaceutical use, reduction in healthy fat consumption, as well as exposure to food and environmental chemicals, which can upset the balance of gut microbiota, increase inflammation levels, reduce nutrient levels, and increase toxic load.

"Most people don't meet the recommended daily intake of choline in their diets and stress and high cortisol levels can also worsen acetylcholine deficit, the main neurotransmitter associated with memory and processing of information."

And then we must factor in the mental health effect in relation to brain health.

Alice Bradshaw, Nutrition Education and Information Manager at Terranova Health, advised: "Mental health concerns appear to be increasingly prevalent and include issues such as low mood, depression, stress and anxiety. In the UK, depression is now fairly common and according to NHS figures, about one in 10 of us are affected at some point in our lives.

"The ongoing Covid-19 pandemic, and the resulting changes to our lifestyles in order to combat its spread, are significant contributors to this mental health problem. In recent months, many have had to endure social isolation, a lack of routine and sleep, anxiety around health, illness (which could be their own illness or a family member), disorganised meal patterns, and a disruption to home and working life."

Gorman added: "One in three adults in the UK, have experienced worsening levels of stress, loneliness and anger during the pandemic, according to researchers in Southampton. It is well recognised when we become stressed, anxious, depressed, or undergo any kind of trauma, cognition and thought processes can become impaired. During prolonged stress and anxiety, we are able to cope with routine everyday tasks, which are biologically hardwired into us, but our brains may struggle with anything involving planning, or thinking outside the box.

"During lockdown, activities such as exercise or meeting friends, which help increase happy hormones such as serotonin and dopamine, all came to a standstill. Sleep has been affected too, while some suffered insomnia, others reported disturbed sleep, experiencing more vivid and emotional dreams. Sleep is an important time for neurological processing, plasticity and memory formation. If we are not getting enough sleep, it can disrupt these vital processes. Studies have linked disturbed sleep to cognitive impairment in older adults. Associations between worse self-reported sleep and lower cognitive performance are well documented."

And Opienski pointed out: "There is emerging evidence, as more people are in post-Covid recovery, that one of the lingering after effects is a reduction in cognitive function. There are reports that estimate about 30 per cent of people with Covid experienced impaired cognition from the outset, and a similar number in recovery. The hypothesis is that inflammation of the brain and reduced oxygenation during and post-infection could be at the root of these symptoms."

\circlearrowright COGNITIVE HEALTH

UNDERSTANDING DEMENTIA

Looking in greater detail at this, Justine Stenger, Nutritional Consultant to BodyBio, advised: "The incidences of Alzheimer's disease are rising, not falling. Studies show that Alzheimer's disease has increased 146.2 per cent between 2000-2018. According to Dr Dale Bredesen's research on Alzheimer's, there are 36 known factors as to why an individual can end up with cognitive decline, or Alzheimer's disease. He classifies this as '36 holes in the roof'. Any one of these 'holes' left untreated can lead to cognitive decline and potentially Alzheimer's disease. Along with his 36' holes' in the roof, he developed different root cause subtypes of Alzheimer's disease. The five subtypes are:

- Type 1 Inflammatory.
- Type 1.5 Glycotoxic.
- Type 2 Atrophic.
- Type 3 Toxic.
- Type 4 Vascular.
- Type 5 Traumatic

"There is a myriad of factors that contribute to poor cognitive health. Optimising diet, nutrient and antioxidant status, hormones, mitochondria functioning, metabolic health, sleep, stress, and GI health. Exercising, engaging in brain stimulation, and fasting are also important pieces of the puzzle."

Hannah Braye, Nutritional Therapist and Head of Technical Advice at ADM Protexin, which developed the Bio-Kult Mind product, added: "Dementia is a general term used to describe a set of conditions which affect memory, problem-solving abilities, language and activities of day-to-day living. Alzheimer's disease is the most well-known form of dementia, affecting 50m people worldwide. This number is predicted to more than triple to 152 million by 2050.¹

"Being overweight in mid-life is said to be a risk factor for developing dementia, including Alzheimer's disease. Obesity and related illnesses such as type 2 diabetes have been shown to significantly and independently increase risk for Alzheimer's disease.² In fact, cognitive decline is being suggested by some scientists to be driven in large part by metabolic processes.₃ Accumulating evidence suggests that reduced glucose utilisation occurs in the brain from the early stages of dementia⁴⁵."

Some researchers have coined this scenario 'type 3 diabetes' and suggest a role for impaired insulin signalling in the pathogenesis of Alzheimer's disease.⁵ High levels of blood sugar have been reported to enhance the production of beta-amyloid in the brain, plaques of which are a common hallmark of Alzheimer's disease.⁶ As blood sugar levels

ncrease, so too do insulin levels necessary to help our cells utilise the glucose for energy.

"Interestingly, an enzyme in the brain called insulin-degrading enzyme, breaks down both insulin and beta-amyloid in the brain.⁷ While insulin levels are elevated insulin-degrading enzyme prioritises clearing the insulin, allowing the beta-amyloid to accumulate.⁷ When insulin levels are low, such as when our sugar intake in the diet is low, insulindegrading enzyme will be able to focus on breaking down amyloid proteins. Normalisation of metabolic syndrome has been shown in studies to lower the risk of all dementia types; total dementia, Alzheimer's disease and vascular dementia⁸."

And leading Nutritionist, Dr Marilyn Glenville, author of *Natural* Solutions to Dementia and Alzheimer's, commented: "Accounting for 50 to 75 per cent of cases, Alzheimer's disease is the most common form of dementia, caused by plaques and

tangles developing in the brain. The second most common cause of dementia in the under-65s, but less common in older people, frontotemporal dementia is caused when abnormal proteins prevent the brain cells from communicating with ea as they should.

"One-third of cases are thought to be genetic. Symptoms may include personality changes, repetitive behaviour, changes in appetite (which can lead to uncharacteristic binge-eating), and difficulties with decision making, problem solving and concentration. The third most common cause of dementia, usually occurring in people over the age of 65 years is Lewy bodies. Lewy bodies are clumps of proteins that develop in the nerve cells. These damage nerve-cell function and inhibit the way the cells communicate with one another.

"Vascular dementia causes between 20-30 per cent of dementia cases but is rarely seen in the under-65s. Someone with vascular dementia will be suffering with a problem to do with blood supply (and so oxygen) to the brain. There are several causes for impeded blood flow, including small clots (sometimes known as Transient Ischemic Attacks or TIAs) that damage the blood vessels, blocked arteries (atherosclerosis) and burst blood vessels (haemorrhages)."

Gorman continued: "Inflammation may significantly contribute to cognitive decline and the progression of Alzheimer's disease. Potent inflammatory molecules such as cytokines/cytokine receptors are

detected in cerebral spinal fluid and plaques from Alzheimer's patients. Oxidative stress and free radicals have been linked to the pathogenesis of neuron degeneration and death."

And speaking more broadly about cognitive function, Jenny Logan, Product Development and Training Manager at Natures Aid, commented: "A cognitive disorder is defined as a problem which significantly impairs the cognitive function of an individual to the point where normal functioning in society is almost impossible. The issues people would commonly think of when discussing cognitive disorders in this context would include:

Dementi

- Developmental disorders.
- Motor skill disorders.
- Amnesi
- Substance-induced cognitive impairment.

wever, given the definition of a cognitive disorder, in my opinion, the most common issues will include anxiety disorder and depression."

\circlearrowright COGNITIVE HEALTH

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IDENTIFYING RISK FACTORS

Age is known to be one of the biggest risk factors in people developing cognitive impairment, but it should also be noted the story far from ends there.

"Age is the biggest risk factor; it is suggested cognitive function peaks in our 20s and a rapid decline can take place in our 60s. Many people notice a natural deterioration in memory and thinking as they get older," Gorman commented. "But people with MCI experience difficulties with memory and problem solving which are greater than expected for their age. Existing conditions such as depression, low vitamin levels, cardiovascular disease and thyroid problems can contribute to MCI, but it does not necessarily lead to dementia. Alzheimer's disease and other dementias often tends to run in families, with genetics, lifestyle or maybe both playing a role."

And Bradshaw continued: "Many factors can contribute to poor cognitive health. Life events, stress, a loss of a family member, loss of income and other similar stressful events are just a few examples. Nutritional imbalances and ageing are also contributing factors to cognitive decline."

Risk factors also appear to be connected to other health issues.

Gorman explained: "Multiple risk factors are now associated with an increased risk of later-life cognitive impairment. These include insulin resistance, hormonal deficiencies, hypertension, hyperhomocysteinemia and depression. Epidemiological studies indicate people with type 2 diabetes have a 65 per cent increased likelihood of cognitive decline. Some even consider Alzheimer's disease to be 'type 3 diabetes', as growing evidence supports the concept it is a metabolic disease which may be mediated by impairments in brain insulin responsiveness, glucose utilisation, and energy metabolism. All of which lead to increased oxidative stress, inflammation, and worsening of insulin resistance."

And she continued: "Lifestyle factors such as lack of physical exercise, stress, poor sleep and infrequent participation in mentally or socially stimulating activities may also contribute to poor brain health. Genetics, such as the hereditary APOE-e4 variant, can increase the risk of developing Alzheimer's disease. But it is always worth remembering while genetics sets the stage for brain health, there are many diet and lifestyle interventions which can help improve and maintain cognitive fitness."

DIETARY INFLUENCES

In terms of the role of our diet and lifestyle choices, there is much discussion around the factors that negatively affect our cognitive health.

"Poor diet is a potential risk factor for cognitive impairment. Studies have shown diets high in calories, processed foods, trans fats, refined sugars, and excess alcohol can be harmful to the brain. In addition to worsening your body's regulation of insulin, they can also promote inflammation and oxidative stress," Gorman commented.

"There is compelling evidence diet is linked to brain health. A number of nutrients, including antioxidants, vitamins, polyphenols, and essential fatty acids are reported to decrease the risk of cognitive decline. So, it is important to ensure the brain is getting all the nutrients it needs by eating a diet rich in vegetables, low sugar fruit, such as apples and berries, and healthy fats, including olive oil, coconut oil, avocados, nuts and seeds, legumes, oily fish and seafood."

Stenger advised: "Metabolic imbalances, nutrient deficiencies, damage to neurons due to an injury or stroke, vascular issues, and oxidative stress, all negatively impact our cognitive health. Eating an anti-inflammatory diet, optimise our micronutrient, antioxidant, phospholipid, and protein status are all important factors to look at.

"According to research, the best brain diet is a mild ketogenic, Mediterranean-DASH type diet, one that is rich in colourful vegetables, leafy greens, berries, fish, and low in saturated fats. According to the research, diets low in carbohydrates with lavish amounts of colourful, organic vegetables rich in micronutrients, moderate protein, and plentiful amounts of bioactive lipids are all components of a diet I would recommend for anyone who wants to protect and optimise their brain health."

Opienski added: "To protect the brain from cognitive problems, recommend a nutritional plan that focuses on whole and functional foods that emphasises diversity, seasonality, organic and minimally processed foods. This should include a range of high fibre vegetables and mushrooms, cholinerich food sources, organic unrefined or hydrogenated fats, essential fatty acids (ideally from wild fish), a range of plant and animal protein sources, a moderate amount of carbohydrates, mainly from vegetables, mushrooms, and some pulses and unrefined grains, a moderate amount of fruit in season, and as broad a range of herbs, spices and seaweeds as possible.

"Including some medicinal mushrooms in your daily intake can have a range of benefits, reishi is useful not just as an antioxidant and anti-inflammatory, but also for regulating cortisol levels and promoting a balanced mood and good sleep; cordyceps improves cellular energy levels, and oxygenation not just for improved stamina and exercise recovery, but also for enhanced respiratory and cognitive function; or lion's mane helps to stimulate NGF (nerve growth factor), which has been shown to encourage the protection and even regeneration of neurons and myelin sheath."

Gorman highlighted the type of diet that is beneficial for the brain: "Epidemiological studies suggest the Japanese, Mediterranean and DASH diets, which have all been shown as protective of other chronic illnesses such as heart disease, blood pressure, are associated with a lower risk of cognitive decline. The Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet combines elements from the DASH and Mediterranean diets, which are believed to be the most important to help improve brain function. The emphasis is on natural plant-based foods, with limited animal and high saturated fat. It specifies consumption of whole grains, nuts, berries, vegetables, especially leafy greens and fish."

And Dr Glenville continued: "The largest study looking at the association between the Mediterranean diet and memory was published in 2013 in the medical journal, *Neurology*. The research showed that eating a Mediterranean diet is linked to a reduced incidence of cognitive decline. The study suggests that what a person eats not only affects cardiovascular health but also brain health.

"The Mediterranean diet is clearly a good one to follow, but in a comparison of diets and their effects on Alzheimer's, researchers looking at the Mediterranean diet, the DASH diet (DASH is an acronym for Dietary Approaches to Stop Hypertension) and the MIND diet (which is the Mediterranean-DASH Intervention for Neurodegenerative Delay) found that if people adhered strictly to any of the three diets, the nutritional benefits could reduce the risk of Alzheimer's. The MIND diet presented a 53 per cent lowered

risk when subjects adhered to it closely, but even those who followed it only moderately had a 35 per cent lowered risk." She continued: "Up until a few years ago, it was thought that insulin simply regulated blood sugar, but it is now understood that it has a number of other functions as well. It regulates neurotransmitters, brain chemicals like acetylcholine, which are important for learning and memory. Insulin is also important for the growth of blood vessels which help supply the brain with oxygen and glucose. This role is important for vascular dementia when the blood supply to the brain is restricted. Insulin is also important for promoting plasticity, whereby the brain can change over a person's lifetime, making new connections."

Speaking specifically if someone does develop cognitive issues, Braye suggested the dietary factors to consider.

■ "Blood glucose regulation – to keep blood sugar levels balanced, try to consume good quality protein and/or fat source with each meal or snack helping to satisfy hunger and sustain fullness for longer and reduce subsequent sweet cravings. Swap processed foods high in sugar or refined white carbohydrates for real wholefoods and stick to a regular routine so your body can regulate hunger hormones and mood fluctuations.

Fasting – during fasting, as blood glucose and insulin levels remain low, the body shifts to using fat as its primary fuel source and subsequently produces higher levels of ketones.¹⁰ Ketones are debated to be a preferable fuel source for the brain. Intermittent fasting was likely a regular part of human evolution, and it's possible our bodies and brains have come to expect periods of food scarcity. Some say we are wired for feast and famine, however, modern living offers us feast, feast, feast! When insulin levels are low, such as during fasting, insulin-degrading enzyme will be able to focus on breaking down amyloid proteins.⁷ Additional potential benefits of intermittent fasting being suggested in early research include enhancing brain function, improving insulin sensitivity, reducing oxidative stress and damage, reducing apoptosis (cell death) and increasing neurogenesis (newly generated brain cells) therefore, increasing the brain's capacity for self-repair and optimal function¹¹⁻¹³."

KEY NUTRIENTS FOR BRAIN HEALTH

There is much to consider here, depending on the areas of brain health that are of concern. Let's start with the B vitamins.

"The B vitamins, B6, B12 and folic acid (vitamin B6 20mg, vitamin B12 500mcg, folic acid 800mcg) as used in the research in *Proceedings of the National Academy of Sciences*, showing that people in the trial using B vitamins in these amounts were almost entirely protected from brain shrinkage compared to those using the placebo. Those taking these levels of B vitamins had 90 per cent less brain shrinkage. The protection against brain atrophy occurred in those areas which are those that Alzheimer's usually destroys," Dr Glenville commented.

"The researchers state that 'demonstrating that B-vitamin treatment reduces, by as much as seven fold, the cerebral atrophy in those gray matter (GM) regions specifically vulnerable to the AD process, including the medial temporal lobe' and 'our results show that B-vitamin supplementation can slow the atrophy of specific brain regions that are a key component of the AD process and that are associated with cognitive decline."

Bradshaw added: "Homocysteine is an amino acid made from the dietary amino acid, methionine. In high levels, it's associated with damage to the inner arterial lining (endothelium) and is a driving factor behind many diseases of ageing, including age-related cognitive decline. Vitamins B6, B12 and folate are among the key nutrients needed to reduce homocysteine. Pantothenic acid (vitamin B5) is particularly crucial to stress management as it is intricately involved in adrenal health. A lack of pantothenic compromises adrenal function and may contribute to fatigue, poor sleep and anxiety.

"Magnesium really is one of the most important nutrients that the body needs but cannot itself manufacture. It's therefore important that the needs for this mineral are met through diet and/or nutritional supplements. Known as the antistress mineral, magnesium exerts a calming effect on the whole body, literally from head to toe."

And she continued: "Additionally, some botanicals may be incredibly supportive to cognitive health. Researchers have noted that elderly residents of rural India who eat a diet high in turmeric have the lowest incidence of Alzheimer's disease in the world. Gingko biloba has been shown to protect against many aspects of cognitive decline, including the reversal or delay of mental deterioration in the preliminary stages of Alzheimer's disease."

In terms of supplement advice, Gorman continued: "Some polyphenols have shown potential as neuroprotective agents, in particular, curcumin, catechins, and resveratrol, which all have antioxidant and anti-inflammatory mechanisms. The neuroprotective activity has been demonstrated in vitro and in various models of neurodegenerative diseases in vivo. Curcumin may be beneficial for those eating a plant-based diet, as studies show it enhances the synthesis of DHA from its precursor, α -linolenic acid, thus increasing DHA in the brain. It also elevates enzymes involved in the synthesis of DHA such as FADS2 and elongase.² "Vitamin A deficiency may also be significant. Low serum and plasma concentrations of vitamin A and β-carotene have been seen in Alzheimer's disease patients, and a higher β-carotene plasma level is associated with better memory performance. The brain is full of receptors for vitamin D and a deficiency has been linked to cognitive impairment. It is now relatively well established that patients with Alzheimer's disease often present lower concentrations of circulating 25(OH)D. In vitro studies show vitamin D can stimulate the clearance of amyloid plaques, reduce amyloid-induced cytotoxicity, apoptosis and inflammatory responses in neurons."

Dr Glenville highlighted essential fats: "As well as eating oily fish, supplements of omega 3 fish oils can also be helpful as DHA, one of the major omega 3 fatty acids in the brain, seems to have the most protective effect against Alzheimer's. The DHA in omega 3 fatty acids helps to prevent the plaque forming in the brain which is present in Alzheimer's.

"Other nutrients which can be helpful include the amino acid, acetyl-L-carnitine, as it increases the brain receptors that would normally deteriorate with age so helpful for brain fog, memory loss, dementia, Alzheimer's and depression. People with Alzheimer's have been found to have a shortage of the neurotransmitter, acetylcholine, in the brain and drugs which mimic acetylcholine are often used as a treatment for Alzheimer's. Acetylcholine is critical for memory and brain function.

"Acetyl-L-carnitine works with coenzyme Q10 and alpha lipoic acid to maintain the function of the mitochondria. The mitochondria are the power houses of the cells, they provide the energy for cells to function and survive."

Logan went on: "A diet high in saturated fats and simple sugars will often also be low in essential fatty acids, including DHA which is vital for a healthy brain. These diets will often also lack B vitamins, magnesium and zinc, which also play vital roles in supporting the health of the brain and the nervous system.

"The omega-3 fatty acid docosahexaenoic acid (DHA), which humans mostly attain from dietary fish, can affect synaptic function and cognitive abilities. DHA constitutes more than 30 per cent of the total phospholipid composition of plasma

membranes in the brain, and thus it is crucial for maintaining healthy cognition."

Braye highlighted polyphenols, commenting: "The brain is one of the organs especially vulnerable to the damaging effects of free radicals because of its high oxygen demand and its abundance of fat cells, so it is not surprising that oxidative stress has been linked to neurodegenerative diseases such as Alzheimer's disease.²⁷ Antioxidants are believed to help protect cells from oxidative stress and have been studied for the prevention and treatment of neurodegenerative diseases.²⁷ A 12 year French observational study published in 2018²⁸ found a polyphenol-rich diet containing specific plant foods such as nuts, citrus, berries, leafy vegetables, cereals and olive oil accompanied by red wine and tea was associated with a 50 per cent lower risk of dementia."

She continued: "Zinc has been proven to contribute to normal cognitive function.²⁹ The brain contains the highest concentration of zinc in the body,³⁰ so it is not surprising that zinc appears to be involved in a number of critical brain functions such as helping brain cells to communicate with one another,³⁰ helping to prevent too high levels of inflammation that could cause damage to brain cells³¹ and acting as an antioxidant to help protect brain cells from oxidative stress caused by free radicals.³¹

And Stenger finished: "Focusing on liberal bioactive lipids and phosphatidylcholine will provide your body with everything that it needs to build healthy functioning cells. These phospholipids provide structure, stability, integrity, and flexibility to the cell membrane. Phosphatidylcholine is a precursor to acetylcholine. Low acetylcholine in the brain is linked to poor memory, concentration, and focus. By supplementing with phosphatidylcholine, we are supporting all levels of cognitive functioning."

THE GUT/BRAIN AXIS

Research is increasing around the role of the gut on the brain, with the experts highlighting how important this element is to consider.

"We are host to trillions of different microorganisms that mostly reside in our gut. Recent studies have demonstrated an association between changes in the gut microbiota, cognitive function,¹⁶ and neurodegenerative diseases such as Parkinson's¹⁷ and Alzheimer's.¹⁸ Emerging evidence suggests that the gut microbiome may play an important role in influencing brain health and cognitive function via a number of pathways, commonly becoming known as the microbiota-gut-brain axis¹⁶," Braye reported.

"Animal studies have for some time been indicating the ability of live bacteria supplements to modulate cognitive behaviours including learning and memory,^{16,19} and initial findings from human clinical trials are looking promising.^{19,20} In particular, a randomised double-blind controlled trial in Alzheimer's patients demonstrated that probiotic consumption for 12 weeks positively affected cognitive function and some metabolic statuses.¹⁹ Neuroinflammation is a theory linked to the onset of dementia²¹ and more recently linked to the gut.²² Live bacterial supplements, including *Bacillus subtilis* PXN21, have shown positive immune supporting²³ and anti-microbial benefits,²⁴ and the ability to prevent toxic protein accumulation in the brain²⁵ with

potential relevance in neurodegenerative conditions. Gorman continued: "People suffering from intestinal

permeability may be predisposed to chronic low-grade inflammation observed in many disorders, including neurodegenerative. Microbial balance is important too, certain species of gut bacteria can increase brain derived neurotrophic factor and the calming neurotransmitter, GABA. So, to support the microbiome, include plenty of fermented foods, fibre, and prebiotic vegetables such as artichoke, leek, apple, garlic, and onion."

Opienski added: "Prebiotics, such as those from lion's mane or *Pleurotus spp.*, for a healthy gut microbiota, and secondary metabolites such as SCFAs (short chain fatty acids), which help to heal gut lining, and produce vitamins, as well as remove toxins via the bowel."

LIFESTYLE CHECK

A part of any protocol should require some lifestyle changes, with Stenger pointing out the importance of exercise.

She commented: "Exercise is one of the few things that we can do that we know increases brain derived neurotrophic factor (BDNF). BDNF increases two to three-fold after strenuous exercise so incorporating exercise into your lifestyle is paramount if you want to protect your brain from neurodegeneration."

Braye added: "We hear of the benefits of regular exercise for most areas of our health so it is not surprising that numerous studies have also highlighted the potential of physical activity to improve overall brain health, which could delay or lessen the onset of dementia conditions such as Alzheimer's disease.³⁴ Furthermore, deficits in brain glucose metabolism and insulin resistance are being increasingly recognised in Alzheimer's disease and have been shown to be positively influenced by physical activity³⁴."

Bear in mind that older clients can still be supported in improving cognitive function, with Gorman commenting: "Start implementing preventative recommendations immediately, it is never too late! Long-term research in Finland on a group of seniors aged between 60-77 showed switching to a diet high in vegetables, fruit and fish, but low in sugar, combined with exercise, and brain training, improved and maintained cognitive function. The two-year study involved 1,260 participants, half were put on the intervention and the others in a control group. The intervention involved a diet, encouraging a high consumption of fruit and vegetables, less than 50g of sucrose a day, and at least two portions of fish per week. Fish oil supplements were recommended for participants not consuming

fatty fish and vitamin D supplementation (10-20µg/ day) was also advised.

"Participants also followed individually tailored exercise programmes designed to improve muscle strength, postural balance and aerobic strength. Plus, cognitive training and social activities. The results found that those who were in the intervention group had improved or maintained cognitive function over time, anywhere from 25-150 per cent better than the control group. An extended follow-up is planned after seven years."





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SIBO – a nutritional protocol

Small intestinal bacterial overgrowth, better known as SIBO, appears to be a symptom of our modern way of living and eating. Here, experts discuss the most appropriate nutritional therapy protocol to combat the condition.

BO appears to be a condition of the modern world, but there are various reasons that we appear to be seeing a rise in diagnosis of this digestive issue. For one, there is no doubt more people are suffering, but we also know that practitioners are so much more aware and educated about the issue, and so are able to spot it in clinic.

The fact more people are experiencing this condition – which relates to overgrowth of bacteria in the small intestine – could well be simply a symptom of how we live, and especially what and how we eat.

Alice Bradshaw, Nutritional Therapist and Nutrition Education and Information Manager at Terranova, commented: "Certainly, more people are now diagnosed with SIBO. There may be several plausible reasons for this. Firstly, an increasing number of practitioners, both mainstream and complementary, are becoming familiar with this relatively new diagnosis. Secondly, many individuals who would previously have been diagnosed with a functional gut disorder, such as irritable bowel syndrome, are now being tested for SIBO, as an overgrowth of bacteria may well be the reason for their symptoms."

Helen Drake, Nutritional Therapist at Cytoplan, continued: "Perhaps we are seeing a rise in cases, but I think it is mainly due to more awareness of the condition, it elicits IBS type symptoms, which has been around for a while but there is now more understanding of SIBO. However, modern diet and lifestyle such as stress, high sugar, low fibre etc., can all contribute so this may be why it is increasing."

A DEFINITION OF SIBO

Although a gut condition, there are various elements related to SIBO to take into account.

"SIBO is characterised by the abnormal overgrowth of bacteria in the small intestine. These bacteria are normal residents within the gastrointestinal tract but should not be seen in large quantities in the small intestine. SIBO research is a rapidly evolving area and the definition has recently been updated. SIBO is now defined as 'A clinical syndrome with excessive normal bacteria that are colonising the small intestine and causing GI symptoms," Bradshaw advised. "The chief role of the small intestine is the digestion and absorption of nutrients, but when bacteria builds up in this area, it causes fermentation of foods and hinders nutrient absorption."

Sarah Oboh, Nutritionist at OptiBac Probiotics, continued: "SIBO is characterised by an overgrowth of bacteria in the small intestine. Every individual has bacteria in their gut which play a key role in digestion, immunity, reduction of pathogenic microbes and the production of essential vitamins. However, if the gut becomes imbalanced and bacteria that usually reside elsewhere in the gut start to grow in the small intestine, SIBO will manifest."

Karen Jones, Registered Nutritional Therapist, who provides practitioner support for Microbiome Labs and Enzyme Science brands in the UK, looking in greater detail at the specifics, explained that the definition of SIBO is "increase in bacteria to $\ge 10^5$ colony-forming units (CFU) per ml of upper gut aspirate. The normal value is $\ge 10^4$ CFU/ml".

The important considerations are what actually causes SIBO? And how can risk be lowered?

"One of the common causes of SIBO is a lack of muscular activity in and around the small intestine. This means that bacteria may not be effectively swept into the colon as they should be and so an overgrowth occurs in the small intestine. Another key contributor to SIBO is low stomach acid.¹ Stomach acid suppresses the growth of ingested bacteria, acting as a defence against infection and bacterial overgrowth in the upper small intestine," Oboh explained.

"However, if the stomach acid is reduced, some bacteria could make their way to the small intestine, where they do not normally reside, resulting in SIBO. In addition, low stomach acid leads to the partial digestion of certain food particles, therefore, providing more food for the bacteria in the small intestine, enabling them to proliferate. It is likely that a combination of several other factors may contribute to the development of SIBO and some of these include antibiotic use, short bowel syndrome, dietary factors, stress and disturbances in the gut immune function."

Bradshaw continued: "There are multiple factors that predispose a person to SIBO. These include complications relating to abdominal surgery or structural problems relating to the small intestine. Any condition that reduces motility in the intestinal tract can predispose a person to SIBO and these include coeliac disease, diabetes, food poisoning and even chronic constipation. Low thyroid function, chronic stress and infections (which damages vagal tone), hormonal imbalances, depressed immunity, obesity and eating disorders have also been suggested as some of the many factors that may contribute to SIBO." Jones brought to attention the need to assess what is overgrowing – whether it's dysbiotic or native microbes. In answer, she pointed to

dysbiotic.

"In a healthy small bowel, there are a lot of gram positive bacteria, such as *Blautia* and *Ruminococcaceae*. In SIBO, there is a taxa shift towards more gram negative bacteria such as *Escherichia coli*, *Klebsiella pneumonia* and *Proteus mirabilis*. But also, some gram positive bacteria such as *Enterococcus species* such as *Enterococcus faecalis* and *Enterococcus faecium*.

"Evidence is they are coming from the mouth. Both *Enterococcus faecalis* and *Enterococcus faecium* can be found in the oral cavity, especially in certain conditions. A study found that 60 per cent of diabetic patients had oral *Enterococcus faecalis* and *Enterococcus faecium* as opposed to only 6.6 per cent in controls. SIBO was found to be present in 43 per cent of diabetic patients. All SIBO patients improved with antibiotics."

She continued: "There is this taxa shift from gram positive to gram negatives in the small intestine in SIBO, which leads to more LPS production, which leads to intestinal inflammation and systemic inflammation, mediated by TNF α and LPS in the bloodstream. When systemic LPS reaches the dorsal vagal complex in the brain stem, it causes inflammation mediated by TNF α , which drastically affects gastric motility. *Escherichia coli* derived LPS has been shown to decrease both the frequency and strength of small intestinal contractions and to eliminate the migrating motor complex."

Drake went on: "Like IBS, the causes of SIBO seem to be multi-faceted but mainly have been attributed to:

■ Low stomach acid – hydrochloric acid in the stomach plays many roles, one of which is to sterilise food that has been consumed. If stomach

acid is low, then excess bacteria can enter the small intestine and colonise there.

■ Low motility – the movement of the gut is known as peristalsis; this moves bulk of food through but will also help to move bacteria through the digestive system as well. If motility is low, which is consistent with constipation, the bacteria have an opportunity to migrate from the colon to the small intestine.

Dysbiosis – overgrowth of bacteria within the colon may translocate through the sacroiliac valve into the small intestine.

Other factors associated with SIBO are low pancreatic (digestive) enzymes, poor immune function and previous bacterial infections."

And Jones also emphasised the importance of stomach acid unctioning.

"Stomach acid is one of the body's natural defences against SIBO as it kills unwelcome bacteria and produces a low pH in the upper part of the duodenum, which favours commensals. If stomach acid is too low, hypochlorhydria, then pH rises in the proximal duodenum allowing for the survival of gram negative bacteria such as *E. coli* and non-commensal grams positives, as found in SIBO.

"What causes a decrease in stomach acid? Age, stress, low magnesium (proton pump is magnesium dependent), low mitochondrial energy (proton pump is energy hungry), dehydration as the hydrogen in hydrochloric acid is derived from water, and anti-histamines as histamine is one of the main receptors that signals for stomach acid release."

She also raised the issue of *Helibactor pylori,* which increases ammonia, vhich increases intra-gastric pH.

"Active *H. pylori* infection was four significantly associated with the presence of SIBO as determined by functional breath testing," she commented.

"Bile has an important antimicrobial role, keeping the small intestinal bacterial levels down with this constant sweeping of bile (up to 50 times in a meal!) and activation of the FX receptor in the ileum. If there is a decreased bile acid pool, this acts in favour of gram negative bacterial growth, as found in SIBO."





IN CLINIC ASSESSMENT

When assessing a client who you suspect may be suffering with SIBO, what are the most common symptoms a person may exhibit?

Jones advised: "The main symptoms are those of IBS, abdominal bloating with belching and flatulence, abdominal pain and cramps, constipation or diarrhoea, or both. Other symptoms include heartburn, nausea and food sensitivities. Small intestinal permeability can cause headaches, joint pain, fatigue, eczema, rashes, asthma, depression, anxiety and more. Malabsorption symptoms including steatorrhea, anaemia and weight loss."

Bradshaw continued: "SIBO is normally suspected in a person who experiences gastrointestinal symptoms, such as excess gas, bloating, gastrointestinal reflux and altered bowel movements. These are also the typical symptoms seen when a person is diagnosed with IBS, and research suggests that a high percentage (possibly over 80 per cent) of IBS sufferers have SIBO as an underlying cause of their symptoms. Researchers have also found that SIBO can coexist or be an underlying contributing factor in many systemic illnesses, including Parkinson's disease, inflammatory joint diseases, poor cognitive function, skin conditions and many more."

Testing wise, there are options to be used as part of your client protocol.

"Currently, the most reliable, non-invasive test for SIBO is breath testing, which measures levels of hydrogen and methane gas that bacteria in the small intestine produce and subsequently diffuse into the blood and lungs. Some labs test for a third gas, hydrogen sulphide," Bradshaw explained.

"These test results can help the practitioner to tailor the treatment for the client. Interestingly, symptoms may correlate with which gases are more abundant on the test results. Hydrogen excess is associated with diarrhoea, whereas methane slows motility and is associated with constipation. Hydrogen sulphide excesses may present as sulphur-like foul gas, or belching, diarrhoea and nausea."

Jones continued: "Small intestine aspiration and quantitative culture is considered gold standard of SIBO testing. Challenges are that results are easily skewed, as bacteria from large intestine can contaminate sample, some of the bacteria cannot be cultured and it's very expensive."

She also suggested raised biomarker on organic acid test as 4-hydroxyphenylacetic acid is an indicator of SIBO and urine marker. "An at home test that measures gas released through the fermentation of carbohydrates in the small intestine. It can measure hydrogen and methane using either glucose or lactulose. Glucose is absorbed quickly in the upper part of the small intestine so doesn't measure what's going on in the proximal part, but rarely gives a false positive," she explained.

"Lactulose is non-absorbable so travels all the way through the small intestine and very unlikely to give a false negative but can be prone to giving false positives and not suitable for lactose intolerant. However, lactulose ends to give a better overview. Neither can measure hydrogen sulphide gases."

Research is also an expanding area when it comes to SIBO.

"Nutritional Therapists need to keep abreast of all the latest studies and nuances within SIBO treatment as research is ongoing and things seem to change rapidly. For example, what was once known as SIBO with methane overgrowth (as diagnosed on a methane positive breath test) is now referred to as intestinal methanogen overgrowth (IMO)," Bradshaw pointed out.

"It's recognised that Methanobrevibacter smithil, (the organism found in a positive methane breath test), is an archaeon (not a bacteria) and can overgrow in areas outside of the small intestine. In practical terms, what this means is that the broad-brush diet and supplement approach that we have used for years for SIBO patients may need refining and personalising for clients. Of course, the standard advice to eliminate processed foods, sugar, alcohol and manage stress and sleep applies to all cases."

Drake added: "Brain fog is associated with SIBO, cementing further evidence for the gut brain connection. Also, it is noted that probiotics are not necessarily helpful for SIBO as can encourage further overgrowth. However, most evidence is conflicting and inconclusive with this, therefore, it is important to address each person individually."

And Jones continued: "Clinical studies are underway for using a capsule with an in-built camera as a new way to test for SIBO. The camera determines where it is within the digestive tract and once it reaches a certain point, it reveals a sponge that absorbs the contents of the lumen. A receiver worn by the patient then determines it the sample has enough bacteria to qualify as SIBO (www.emg-health.com/omnipresent/can-a-swallowable-camerabe-the-solution-to-sibo-diagnosis/')."

NUTRITIONAL THERAPY PROTOCOL

In terms of you as Nutritional Therapists, there are a range of considerations to make when recommending an effective protocol fc clients with SIBO.

For Drake, there are some specific things to consider:

"Avoid FODMAPs – FODMAPs are dietary sugars and carbohydrates, which are easily fermented by the bacteria and can exacerbate symptoms of gas, bloating and pain. Therefore, it is often very useful to remove them from the diet. FODMAPs stand for: fermentable oligosaccharides (e.g. fructans found in wheat, garlic, onion and chicory etc., and galactans found in legumes, including beans, peas and lentils; disaccharides (e.g. lactose found in milk products); monosaccharides (e.g. excess fructose found in fruits, honey, high fructose corn syrup etc.) and polyols (found in sweeteners containing isomalt, mannitol, sorbitol, xylitol, plus stone fruits such as avocado, apricots, cherries, nectarines, peaches and plums)," she advised.

"There are many sites available online that identify sources of FODMAPs. After excluding high FODMAP foods for a month, foods from each FODMAP group should be reintroduced, one at a time (e.g. foods containing fructose, then foods containing lactose etc.). During the reintroduction, symptoms should be monitored and if a FODMAP group of foods causes problems then continue to eliminate this group. It should be noted that avoiding FODMAPs will not remove SIBO but help modulate the symptoms."

She continued: "You can support stomach acid levels by supplementing with betaine hydrochloride just prior to meals, ensuring adequate zinc levels (zinc is important for production of stomach acid and avoiding drinking large quantities of water 30 minutes before and during meal, as this can dilute stomach acid.

"Gut motility can be supported by obtaining at least 1.5-two litres of water per day, consuming soluble and insoluble fibre from vegetables, fruits and moderate amounts of wholegrains, taking a live bacteria supplement, taking a magnesium supplement (magnesium is involved in muscle relaxation) and gentle exercise.

"If digestive enzymes are low, larger molecules can sit in the small intestine for longer periods of time and be more prone to fermentation, which can exacerbate IBS symptoms. There are tests available to determine digestive enzyme function, but in cases of SIBO, it is likely that digestive enzyme function is already somewhat impaired and therefore supporting pancreatic enzymes, as well as bile production, in the shortterm, can aid symptom relief and repair. You can support pancreatic and digestive function by taking a digestive enzyme supplement with meals, consuming bitter foods (lemon, rocket, chicory, watercress), which stimulate bile secretion and obtaining phospholipids from diet or as a supplement to aid fat emulsification."

Bradshaw continued: "Low fermentable diets (such as the low FODMAPs, Specific Carbohydrate, SIBO Biphasic diet) are the mainstay of SIBO diets and these certainly will be helpful for reducing symptoms for virtually all clients as the bacteria/archaea do feed on these and produce gases. Where things may need refining a little is in the case of clients with IMO, where constipation is present. Reducing fibre and prebiotic fibres, as typically suggested for hydrogen dominant SIBO sufferers, may exacerbate constipation in this cohort. Reducing these fibres also result in less short chain fatty (SCFAs) acids, like butyrate, being produced. SCFAs have been shown to reduce methane levels, as well as support healthy colon motility. Specific fibre-rich foods such as flaxseeds, brown rice, nuts, seeds and berries can be introduced as tolerated to provide the polyphenols that are shown to support the healthy bacteria that are correlated with lower methane levels. This is an emerging area of research so it's worth staying abreast of the studies on IMO."

She continued: "For hydrogen methane SIBO, even where a more stringent diet is used, the end goal should always be to allow the client to eventually expand their diet to a highly diverse diet (according to individual tolerance). Diet can help to reduce gas production and therefore lessen symptoms, but to eradicate SIBO, practitioners have many options to work with. Second to diet, natural supplements will be needed for optimal results. Digestive enzymes and probiotics have been shown to help with bloating, bowel irregularities and food reactions."

And so to supplementation, with a range of options available.

"The next step in a SIBO protocol is to consider natural antimicrobial botanicals, which can be combined and rotated to remove or reduce unwanted gut bacteria. Garlic, oregano, thyme, cinnamon and berberine containing botanicals are typically used to reduce the bacterial overgrowth," Bradshaw commented.

"While there are a multitude of supplements that may be utilised to support a client with SIBO, it's important to retain a semblance of



organisation, in order not to overwhelm them with too much information. Eventually, prebiotics, fibre and other supplements can be increased as the client's health improves and natural prokinetic agents (which aid motility) might be suggested. Ginger and artichoke have been studied for their prokinetic effects and these may help to prevent a relapse while supporting proper intestinal motility. A practitioner will need to advise a SIBO client on the importance of proper sleep, exercise and stress management as these are all parts o the gut health conundrum."

Drake also highlighted the need to remove bacteria from the small intestine, commenting: "Primarily, the intervention for SIBO needs to be the removal of bacteria as merely addressing underlying causes and avoiding foods which are exacerbating symptoms will not be enough. Natural antimicrobials can be useful for removing bacteria from the small intestine. These include:

■ **Caprylic acid** – a natural dietary fatty acid which assists in the maintenance of normal intestinal micro-flora and can help inhibit the growth of opportunistic fungi such as *Candia albicans*.

Garlic – long standing use as an anti-microbial.

 Oregano extract – broad spectrum anti-microbial activity.
 Grapefruit seed extract – research shows evidence for anti-bacterial activity against gram-positive and grampositive bacteria.

Green tea extract – anti-bacterial and anti-fungal activity." Oboh turned her attention to probiotics and the need to consider the right type.

She advised: "There may be a concern among Nutritional Therapists that probiotics could exacerbate SIBO symptoms and so are often avoided in the treatment of this condition. Instead, natural anti-microbial supplements are frequently used. However, *Saccharomyces boulardii*, which is a probiotic yeast that does not colonise the intestines and theoretically should not add to the overgrowth, has been clinically trialled in people with SIBO and was found to be effective at helping to eradicate SIBO.²

"When using supplements to eradicate bacterial overgrowth from the body, it is common to experience a side effect known as 'die off', which occurs when microbes release neir toxins into the bloodstream as they are destroyed. This hay cause temporary discomfort and so we would suggest that clients gradually increase the dose of *Saccharomyces oulardii* during treatment. The suggested protocol would e to start with one capsule of *S. boulardii* twice a day for the rst week, two capsules twice a day for the second week and then three capsules twice a day for the third week. This can be pontinued for as long as necessary (until symptoms subside and then the dose can be gradually reduced).

"Whilst Saccharomyces boulardii has been clinically shown to have a broad anti-pathogenic action, making it effective at removing the pathogenic microbes implicated in SIBO, it may also help with malabsorption and diarrhoea – two common symptoms of SIBO.³ Clinical trials have demonstrated *S. boulardii's* efficacy in relieving diarrhoea regardless of the causative agent.⁴ Research also suggests that *S. boulardii* is able to increase villi height, crypt depth and brush border enzymes in the intestinal wall, helping to optimise nutrient absorption – all of which could provide great benefit to clients with SIBO⁵."

And Jones suggested a spore-based probiotic, pointing out its MegaSporeBiotic was shown to reduce LPS translocation by 42 per cent after 30 days use in a double-blind, placebo-based study

"The study was carried out on 28 healthy college students. Serum endotoxin was measured following consumption of a high fat meal (which measures LPS in the blood). Half of the participants were instructed to take MegaSporeBiotic for 30 days and to make no other changes. The other half were given a placebo. After 30 days, the test was repeated, and there was a 42 per cent reduction in serum endotoxin levels in the MegaSporeBiotic group," she commented.

She also pointed towards the importance of high dose liquorice flavonoids, high potency artichoke leaf extract and high potency ginger.

"The liquorice flavonoids contains high quantities of flavonoids to protect the stomach lining, reduce *Helicobacter pylori* and reduce inflammation, while containing less than 0.5 per cent of glycyrrhizin, so as not to elevate blood pressure. Ginger has been shown to aid gastric emptying and peristalsis, which help prevent stasis," she commented.



Combatting Covid: what are we missing?

With awareness of micronutrients and a deep appreciation of immune system mechanics, the integrated approach to prevention and treatment of SARS-Cov-2 infection has a lot to offer, but what are we missing? Nutrition I-Mag's sister magazine, IHCAN, and its Editor, Simon Martin, talks to the UK's most experienced naturopath and product developer, Bionutri's John Stirling, ND, who reminds us of some basics.

Simon Martin (SM): Covid-19 has a 93-99 per cent survival rate (depending whose statistics you believe), appears to be vulnerable to interventions such as vitamin C, D and even aspirin, and most severely impacts those compromised by age, existing health conditions and pro-inflammatory genetics. With that said, it is a nasty illness to get. What's your take on the situation?

JOHN STIRLING (JS): I agree with your assessment, especially about those who have existing conditions or a predisposition being those more susceptible to Covid-19. I would add that the elderly are clearly more susceptible, as a whole, due largely to an 'ageing' immune system. Of course, that's not all down to age, but compounded by diet and lifestyle. The worrying trend seems to be a shift to a younger age group. But I



John Stirling, ND

think your point about susceptibility is a good one, in that this virus more severely picks on individuals who have a 'weakness'. There are people across all age groups who superficially appear healthy but have a health condition brewing away undetected. What this virus does is bring this to the fore, almost as if it is accelerating the pathology or parasitically using the weakness to its advantage. Again, I agree about this being a nasty illness to get. The aftermath in some individuals can be long-term, and it's still too early to really gauge the true impact post-infection. Then, of course, there is the very real problem of viral mutation, which is another topic in its own right.

SM: Agreed. Let's just top that up by highlighting the very recent University of Edinburgh study, which, after examining DNA

from 2,700 Covid-19 patients from 208 UK intensive c identified five genes that increase the chances of an infected person having a very severe reaction and being admitted to an ICU – and dying. Two of these genes are to do with a direct antiviral response, and two are to do with inflammation. This is one of the ways in which we have superficially 'healthy' people dying after a SARS infection. Now, you were schooled, through your own brush with cancer, in what we would now call the 'integrated' treatment developed by Dr Josef Issels. He was a pioneer in an immunological approach that is still relevant to cancer treatment today - what would he have done with something like SARS?

JS: My experience with cancer was a turning point. I was diagnosed

in my final year studying Biology and Environmental Science, aiming to join Australia's Department of Fisheries and Wildlife on graduation. How I found my way to Dr Josef Issels' hospital in Germany is a long story, so let's just say it started with me being a patient and ended with me working there in the biochemistry department. A post-graduate course if ever you saw one!

Dr Issels started his medical career as a surgeon, primarily dealing with cancer. His interest in the immune system was a result of his disappointment with the long-term survival rates being achieved by surgery and chemotherapy. His journey to the point where he developed his immunotherapy program wasn't easy, with a lot of resistance along the way. I think Dr Issels' approach to the current viral pandemic wouldn't be all that different to his immunotherapeutic approach to cancer. The basic principle was that "a truly healthy body has the ability to resist cancer". You could substitute SARS for cancer. So, the aim was to restore host immunity. To achieve this, Issels used diet, oxygen-ozone therapy (antiviral), intravenous vitamin C, immune stimulants, aspirin, rectal probiotic implants and autogenous vaccines made from the patient's own blood or tumour. He emphasised improving diet and the status of the intestinal microflora.

SM: Knowing what we know now, we could also say that Issels' 'truly healthy body', one that is resistant to viruses, is as dependent on genetics as anything else. (Nutrigenomics, step forward, please.) It sounds like, whether he knew it or not, the Issels protocol was correcting for those kinds of inbuilt weaknesses. Issels was a genius, but where did his immunology ideas come from?

JS: Dr Issels started corresponding with other researchers who had come to similar conclusions – that the ultimate conquest of cancer and many chronic diseases must lie in harnessing the immune system.

Keep in mind that Issels was saying this as far back as 1947, when immunotherapy was very much in its infancy. Issels started treating his cancer patients post-operatively with dietary changes in order to increase recovery and improve overall health. He took an interest in homeopathy and incorporated that into his treatments. As his practice grew, he started looking at other therapies. He took great interest in the work of Prof Franz Gerlach, a well-published and respected scientist, who had similar views on how the immune system could be reinforced and used as a weapon against viral and bacterial infections, as well being a potential treatment against cancer.

Prof Gerlach influenced Dr Issels' interest in treating the intestinal microflora using high-dose probiotics, not just taken as capsules or in a drink, but in rectal retention enemas. Prof Gerlach eventually collaborated with Dr Issels in a department of microbiology in the newly established Issels Hospital. Prof Gerlach headed up the production of auto-vaccines as personalised immune stimulants, as well as research into the analyses of intestinal bacteria in cancer and other chronic diseases.

Both Gerlach and Issels could demonstrate the positive impact on blood-born immune markers by providing patients with a variety of highpotency probiotic combinations. Gerlach described the benefits of butyric acid as a by-product of probiotics fermenting fibre in the diet – still an under-appreciated factor in the health and integrity of the gut.

Prof Gerlach spent the rest of his academic life pursuing the role of intestinal bacteria and probiotics as potential ways of positively manipulating the gut immune system. Gerlach postulated that it might be possible to develop specific combinations of probiotic bacteria aimed at certain health conditions. Far-sighted thinking! His work was largely ignored as his views were considered too 'unorthodox'. He undoubtedly had a profound influence over Dr Issels in shaping his views as to the importance of gut bacteria as an immunotherapy.

SM: What do you take from those great pioneers that is particularly useful today?

JS: I think the simple take-away from the pioneering work of people like Dr Issels, Prof Gerlach and Prof Werner Zabel is that natural immunity is of utmost importance in building resistance not just to cancer, but against viral and bacterial diseases as well.

I'm not a fan of shotgun supplementation outside of a hospital situation. About 20 years ago, I think I was one of the first in our industry to question the overuse of high-potency antioxidants for extended periods. Free radicals have a role to play in health, as well as in disease.

Current research into the influence of high-potency probiotics on the gut microbiome is slowly becoming mainstream science. A long journey from the laboratories of the Issels Hospital.

More attention needs to be focused on the integrity of the gut and

"There are the intestinal microflora. people across all Especially picking up on the beneficial age groups who nutritional role of the superficially by-products of fermentation appear healthy, in the gut – compounds but have a health like butyric acid, propionic condition brewing acid and acetic acid – all of away undetected" which have vital roles to - John Stirling, ND. play in local gut immunity.

SM: You had a unique exposure to ideas that were way ahead of their time. How has all that influenced your own career – both as a clinician and mentor to what must be thousands of nutritional therapists by now, but also in terms of product development?

JS: The Issels experience was a major learning curve. Most of today's practitioners aren't aware that Issels established the very first fully-fledged medical hospital dedicated to integrative medicine. The hospital was fully decked out with a pathology department, research facilities and treatment rooms, nurse stations on every floor and patient bedrooms capable of accommodating 160 patients. It was unique in that 99 per cent of all patients admitted were considered to be terminal or beyond further conventional treatment.

Issels offered hope for the hopeless; he never lied or made promises other than to do his best and was always fiercely honest with his patients and never gave up on them. It was a great privilege to have worked alongside him and, above all, to see the results of his work first-hand. That was what motivated me to eventually return to Australia and do a naturopathic degree. Issels wanted me to stay in Germany and pursue a medical degree, but three years in a cancer hospital dealing with terminal disease was enough! Nonetheless, the experience was an apprenticeship I couldn't have got anywhere else. Also, working in the biochemistry department tracking the impact of treatments gave me firsthand experience of what was or wasn't working.

For example, many of the patients had malabsorption problems, and it was this situation that led me to develop lipomulsions in conjunction with the hospital kitchen, with Dr Issels' approval, of course. The kitchen staff gladly complied with putting together my rather odd concoctions. Effectively, I became a test animal, along with members of the kitchen. I had a captive audience, although they weren't all that taken by me extracting their blood on a regular basis for analysis. Little did I know at that time that years later, lipomulsions would be a feature in products I developed when Robert Joy and I founded BioCare and later, Bionutri.

SM: How did you make the leap from practitioner to building a major supplement brand?

JS: It was after I came to the UK at the invitation of Dr Alec Forbes, the Medical Director of the Bristol Cancer Help Centre. Alec had been invited to tour Australia by the International Association of Cancer Victims and friends. I happened to be the Vice President of the Association at the time and spent considerable time with Dr Forbes discussing treatments and protocols for all sorts of conditions. Alec was aware of Dr Issels and was keen to know what he was doing. Some months later, Alec invited me to work with him at the Bristol Cancer Help Centre. After moving to the UK, things didn't work out that well; Dr Forbes decided to leave the centre, but he introduced me to Gerard House, a reputable herbal medicine company in Bournemouth, which was looking for a technical manager – I got the job. It was there that I met Robert Joy. Gerard House was eventually sold, so I was cast adrift. Cutting a very long story short, I went on to found BioCare together with Robert. Eventually, I was able to focus more on developing the product range, drawing on my past experience working at the Issels Hospital and also my time in Australia running a busy naturopathic clinic.

SM: What were your first products?

JS: Initially, my interest was gut-related products. I believe I was the only one providing buffered butyric acid capsules to the practitioner market, along with timed-released caprylates. However, the missing link was a decent home-grown probiotic. This changed after I was introduced to Dr Nigel Plummer, a PhD microbiologist, who had considerable technical expertise in the manufacture of human-strain probiotics. A couple of years later, we set up a manufacturing site in Wales specifically to develop and manufacture our own products in-house. A few years ago, we sold BioCare. From that experience, Bionutri was born, moving back towards the original philosophy that drew us all together in the first place. This time around, however, focusing on a smaller but more specific range of products.

The gut and associated microbiome remains a keen focus for further product development at Bionutri. And although it's a long way from those very early years in the 1970s, working with Dr Issels and Prof Gerlach on cancer, their enthusiasm for butyric acid and 'immuno-probiotics' remains a strong motivation and influence. And with SARS-Cov-2 still on the loose, this back to basics thinking may be more important than ever.

Keeping the heart healthy

Whether it's the effect of Covid-19 on our dietary habits, the expanding waistlines of the nation, or the fact that deficiency in key nutrients appears common, our hearts are under great pressure. And here, nutrition experts discuss the critical role of nutritional therapy in keeping this organ healthy.

t seems that Covid-19 has a lot to be held accountable for, not only in its immediate threat to our health (and freedoms) but also the longer-term effect in our changing habits, and, in turn, a decline in health. For example, concerning research from Drinkaware revealed that around two in five (38 per cent) of people on furlough and a third (33 per cent) of parents with at least one child under 18 drank more alcohol since the start of lockdown.

And then there was the concerning analysis from the British Heart Foundation (BHF), which has revealed that there have been almost 800 excess deaths in those dying below the age of 65 from heart and circulatory diseases since the Covid-19 pandemic began. It explained that figures from the Office for National Statistics show that excess deaths in England and Wales for many health conditions spiked during the first peak of the pandemic in March and April. Then, in the 10 weeks following, the numbers fell back to levels seen before the peak. But excess deaths from heart and circulatory diseases in people under 65 remained disturbingly high, even after the first peak – with rates almost 13 per cent higher than usual between May and July.

The foundation believes that delays in people seeking care,

coupled with a reduced access to routine tests and treatments during the pandemic, have likely contributed to the rise in excess deaths.

These factors all place huge pressure on our collective heart health, and that is before you consider that even prior to the pandemic, there was cause for concern; according to the British Heart Foundation, the National Child Measurement Programme has found that 21 per cent of children aged 10-11 have obesity, the highest number on record, while around 35 per cent of Year 6 children have a weight classed as overweight or obese. What this means is the younger generation are being set up to raise their risk of heart-related ill health.

Commenting when the research was published in November, John Maingay, Director of Policy and Influencing at the British Heart Foundation, said: "These figures are a sobering reminder of the UK's growing obesity crisis, which could deepen health inequalities and lead to a future of ill health for a generation of children. Children with obesity are more likely to become adults with obesity, who will then be at greater risk of developing heart and circulatory diseases and their risk factors, such as Type 2 diabetes."

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THE SCALE OF THE PROBLEM

Heart-related conditions rank amongst the biggest killer in the UK, and Lindsay Powers, Nutritional Therapist and Health Coach at Good Health Naturally, highlighted just how concerned we should be with the rates.

"Heart disease is one of the biggest threats to public health in the UK today, with figures from the British Heart Foundation stating that these conditions affect one in four people. Whilst they suggest that deaths from heart and circulatory disease have halved in recent years, it still accounts for a quarter of all deaths in the UK or 170,000 deaths each year. Figures from the BHF also state that there are around 7.4m people living with heart and circulatory disease in the UK, affecting 3.9m men and 3.5m women," she advised.

"Whilst we are dealing with extremely large numbers here, the BHF suggest that since they were established and have been promoting lifestyle modifications, the annual deaths from heart diseases has actually halved. In 1961, more than half of all deaths in the UK were attributed to heart and circulatory disease, so there are some improvements based on their figures."

Dr Marilyn Glenville, a leading Nutritionist and author of Natural Solutions to Alzheimer's and Dementia, continued: "The British Heart Foundation says that heart and circulatory diseases kill more than one in four people in the UK and each day, one person every three minutes dies from cardiovascular disease. The BHF states that pioneering research, along with medical advances and lifestyle changes, have halved deaths from heart and circulatory diseases in the UK but these diseases are still accounting for nearly 170,000 deaths each year."

Dr Max Gowland PhD is Chief Scientific Officer at FutureYou Cambridge, which the supplement brand, Prime Fifty, is part of. He agreed that cardiovascular health remains a huge concern throughout the health industry, highlighting that the scale of the problem costs the NHS more than £9bn every year.

But he added: "Despite these numbers, there has been progress in terms of survival following an MI (heart attack) in that in the 1960s, 70 per cent died after an MI. Today, 70 per cent survive. But IHD (ischaemic heart disease) is the single largest cause of death worldwide, causing 7.2m deaths in 2008, 12.7 per cent of total global mortality and there is more than 20-fold variation in IHD mortality rates between countries. Over the last 25 years, age-standardised IHD mortality has fallen by more than half in high income countries, but the trend is flat or increasing in some low-and-middle income countries. Low-and-middle income countries now account for more than 80 per cent of global IHD deaths."

Dr Gowland continued: "Heart health in general seems not to be increasing, but rather, treatment options and treatment efficacy has clearly improved over time, making survival from cardiovascular issues higher than ever before. However, mortality from cardiovascular disease is now expected to rise in the coming decades due to worsening of metabolic risk factors such as high BMI, diabetes, hypertension, and high LDL cholesterol."

Looking in greater detail at the heart conditions facing Brits these days, Dr Glenville advised: "Coronary heart disease is the most common type of heart and circulatory disease and is the most common cause of myocardial infarction (heart attack). It is a build-up of atheroma, causing the coronary arteries to become narrower. And unfortunately, people with a history of heart disease are twice as likely to develop vascular dementia so it is important to know that the changes that can be made to help work on prevention for heart disease are also going to have a huge benefit for vascular dementia.

"Vascular dementia causes between 20 and 30 per cent of dementia cases and is the second most common cause after Alzheimer's and is triggered by a problem of blood supply to the brain."

Gorman continued: "Coronary heart disease (CHD) is the most common type of heart and circulatory disease diagnosed in the UK. It occurs when there is a narrowing of the coronary arteries due to a build-up of fatty deposits and other debris, leading to potential blockages and heart attack. This is the leading cause of death in the UK and worldwide. BHF figures state that this affects one in seven men and one in 12 women. Having CHD or a heart attack is also likely to increase the risk of stroke.

"Another common heart health issue is atrial fibrillation (AF), which is associated with an abnormal heart rhythm (arrhythmia). It is believed that this condition can also increase the risk of stroke. There is a strong link between those diagnosed with diabetes type 2 and an increased risk of developing heart disease. In fact, you may be twice as likely to die from heart disease if you have diabetes type 2."





The British Heart Foundation explains that the more risk factors you have, the more likely you are to develop heart and circulatory diseases like heart attack or stroke.

"Unfortunately, people in the UK dying from heart and circulatory diseases before the age of 75 is rising. And it is rising for the first time in 50 years. A number of factors could be involved, including a growing population but also undiagnosed risk factors. These risk factors will include millions of people who are risk because they have undiagnosed high blood pressure and/or type 2 diabetes," Dr Glenville pointed out.

"Because of the increase in people with undiagnosed type 2 diabetes and/or high blood pressures, there is going to be a definite decline in heart health. The high incidence of people being overweight and obese is also adding to the decline in heart health, as well as the lifestyle factors of unhealthy diet and lack of exercise."

Frank Brogan, Senior Nutritionist at Pharma Nord, added: "Some common risk factors aren't discussed as others. For instance, we talk freely about cholesterol and blood pressure, but rarely inflammation and calcification. Inflammation of the arteries plays a huge role in the development of atherosclerotic plaque (and, therefore, cardiovascular diseases), while calcification can severely reduce the flexibility of the blood vessels."

And Gorman went on: "Diabetes is a significant risk factor for heart disease, with one third of adults with diabetes dying from heart disease or stroke. According to conventional medicine, high blood cholesterol is also said to be a significant risk factor for developing heart disease. Although, in some fields of research, there has been a significant shift in our understanding of the role of cholesterol as a risk factor in more recent years, and it may not be the predictor of heart disease as we once thought.

"Areas such as high homocysteine are coming to the forefront of our understanding as posing a potentially greater risk. Other risk factors include, age, gender, ethnicity, family history and lifestyle factors such as smoking, being overweight or obese, diet and levels of exercise, and stress"

Dr Gowland continued: "Clearly, genetics plays a part role in the risk of cardiovascular (CV) disease, but we ourselves can do so much to reduce our CV risk by eliminating smoking, reducing stress, eating healthily and also controlling our weight. And, of course, exercise is crucial and becomes even more important a factor as we age. Supplementation is also a key lifestyle lever we can pull, which can support our CV health."

When it comes to predicting heart-related conditions, Dr Gowland turned his attention to blood biomarkers.

"After many years of hearing the same diet advice and the same antisaturated fat messages, the latest science is showing that saturated fats and cholesterol are only part of a much more complex picture. In a slightly strange way, it's always interesting to note that cholesterol is required

for life! Without it, we would simply not exist, as this molecule is used to synthesise a selection of key hormones, including the pro-hormone, vitamin D. Cholesterol is also used to make bile, a greenish fluid made by the liver and stored in the gall bladder, to later help digest fatty foods," he explained.

"Also, the standard TRIG (triglycerides), cholesterol, HDL and LDL (the so-called bad cholesterol) blood test panel is now viewed as a little too simplistic to actually predict CV disease risk. The more advanced cardiologists are now measuring LDL particle number and also particle size, both of which have been shown to better correlate with heart disease risk. Another up-and-coming test is the calcium score, which is a special type of CT scan which focuses on the amount of deposited calcium in the blood vessels. Again, a little too expensive for the NHS, but quite a good predictor of CV issues. What a pity that this is not a regular test for all over 50s!

"Another guite simple biomarker is homocysteine. Its measurement can be done guite cheaply, using even home test kits and there is much evidence in the literature that high homocysteine levels are linked to heart disease. The level of homocysteine can be controlled to an extent, simply by having the right amounts of vitamins B6, B12 and folate, all of which have been shown clinically to control homocysteine levels in blood. Low levels of these key vitamins will lead to rising levels of homocysteine and this can be indeed a very unhealthy practice."

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PREVENTATIVE MEASURES

There are many elements to a heart protection plan, incorporating nutrition and lifestyle.

Dr Glenville believes there is much work that needs to be done in the area of educating around prevention, with much of it focusing on our diet.

She commented: "We have had a prevailing myth for a number of years that excess cholesterol in the arteries causes plaque, which is due to excess cholesterol in the blood, which is due to fatty foods containing cholesterol in the diet. In 2015, a study in the *British Medical Journal, Open Heart*, showed evidence that dietary recommendations to reduce fat to less than a third of total energy intake had been introduced to 220m people in the US in 1970 and to 56m in the UK by 1983 without the supporting evidence from randomised controlled trials¹

"Even more recent research in 2010, which combined the results of 21 studies (a staggering 347,747 people followed for up to 23 years) stated 'there is no significant evidence for concluding that dietary saturated fat is associated with an increased risk of coronary heart disease, stroke and cardiovascular disease².

"In 2009, the American Heart Association published a scientific statement in its journal, Circulation, entitled 'Dietary sugar intake and cardiovascular health'³, in which they expressed concern that sugar and refined carbohydrates can increase triglycerides (a known risk factor for heart disease), while lowering levels of HDL. HDL is the 'good' cholesterol, which would normally remove cholesterol from the arteries (LDL is the 'bad' cholesterol). If HDL is low, cholesterol could build up in the blood vessels. They also pointed out that high sugar consumption is associated with an increase in inflammation and oxidative stress, both of which increase the risk of heart problems. We should be concentrating on eliminating sugar and refined starchy carbohydrates from the diet, rather than concentrating on fats."

Dr Gowland agreed with the concern around our

attitude to fats, adding: "In terms of preventative strategies, it is abundantly clear that the silver bullet is regular exercise, followed closely by healthy nutrition, of course. There is still some out of date thinking that is being taught that low fat diets are the answer for health, and this has been overtaken by many studies showing that higher fat diets can even be healthier than low fat regimes. Even the old myth of cutting down on cholesterol seems to still be bounded around even by health professionals, which is a little disturbing.

"I think one of the most interesting and more recent knowledge breakthroughs must be the understanding of both LDL particle size and LDL particle numbers, which is much more indicative of future cardiovascular events than the standard cholesterol panel, which is still being used as a crude indicator of health. A further addition to the potential predictors of cardiovascular health must be the calcium score, where patients have their arteries checked for the build-up of atherosclerotic plaques as this is a certain and quite visual indicator of potential heart disease. However, neither of these techniques are available on the NHS due to high cost, but both are so much more indicative."

And Gorman added: "One of the most important is to stop smoking, as this contributes to thousands of deaths each year from heart disease. As being overweight or obese is another risk factor, aim to maintain a healthy weight, and seek the help of a qualified nutritionist if you need a plan and support to reach your goals – which again highlights diet as one of the key areas to focus on in terms of supporting long-term heart health. Research has found that a diet high in ultra-processed foods can have a big impact on cardiovascular health, and therefore, demonstrates how significant this link is. Exercise has also been researched for its positive benefits in terms of heart health, and even taking a daily walk is beneficial."



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DIETARY INTERVENTIONS

A healthy heart is often linked to the Mediterranean diet, and elements of this should be borne in mind when advising clients. Added to that, nutrient deficiencies must also be considered. From a dietary recommendation perspective, much of the advice is pretty simple.

"First of all, clear all the ultra-processed foods from the diet, as research shows they are linked with poor cardiovascular health. It also comes as no surprise that many processed foods contain high levels of sugar (often from hidden sources), as well as the more obvious sugary snacks, and sugar is the primary cause of inflammation. When you eat excess sugar, the extra insulin in the bloodstream can affect the arteries, leading to inflammation and hardening and damage to the arterial walls, known as atherosclerosis. This is associated with an increased risk of heart disease," Gorman commented.

"The good news is that eating more plant foods is a really beneficial way to support heart health, and it's really easy to add more veggies to soups, salads, stir fries and stews. Include more plant foods at every meal and snack, alongside lots of healthy fats, nuts and seeds, and legumes as well. Omega 3 fatty acids, in particular, are very heart friendly as their anti-inflammatory properties can help protect the blood vessels from inflammation and damage, as well as reducing overall triglycerides in the blood. Aim for two to three portions of oily fish a week, and include walnuts, chia seeds, flaxseeds and hemp seeds for vegan options."

A key point to note is the importance of controlling cholesterol, one of the most common risk factors.

Dr Glenville advised: "Cholesterol in its own right is not dangerous; it is when it has been damaged by free oxidising radicals that problems occur. Free oxidising radicals are natural by-products of energy production, but these molecules can be neutralised by the presence of antioxidant nutrients such as vitamin A, vitamin E and vitamin C. It is, therefore, very important to include fruits and vegetables in the daily diet.

"Lowering cholesterol levels via dietary means is not simply a matter of cutting out the cholesterol containing foods. In fact, many studies have been carried out to show that eating a diet containing moderate amounts of cholesterol, for example, eggs, is not associated with an increased risk of heart disease.

The main dietary factors to consider in helping to lower cholesterol include the introduction of foods that will help to:

■ Alter the type of cholesterol by increasing the HDL form. Do this by increasing exercise and reducing stress and introducing foods such as garlic, soya and the good essential fatty acids.

■ Remove excess cholesterol from the body by supporting the liver and improving digestion by increasing the amount of soluble fibre that is eaten.

■ Remove foods that may interfere with the regulation of cholesterol synthesis, which includes alcohol, caffeine and refined sugars.

Dr Glenville continued: "Oat bran fibre has been shown to significantly lower cholesterol levels, as well as reduce LDL and increase HDL levels. Beetroot, carrot, psyllium fibres and oryzanol (an oil found in the bran of rice) have also been found to reduce both total and LDL cholesterol. Fibre is also found in all fresh fruits and vegetables. Apart from fibre, fruits and vegetables also contain powerful antioxidants,

including flavonoids and vitamins A, C and E. Antioxidants work by disarming harmful free radical molecules that can damage cholesterol and fat travelling through the arteries. It is the damaged cholesterol and fats that can build up within arterial cells, eventually forming a growing mound on the inside wall of the artery."

And let's not underestimate the critical role that the right fats play in the heart.

"In 2020, the most comprehensive study on omega 3 intake and heart health to date was published. Researchers found omega 3 intake slashed heart events between 10-35 per cent. To reap the benefits, daily omega 3 doses of 1000mg per day were recommended. While this can be achieved in diet, as a population, we are generally averse to oily fish and so supplementation is often indicated," advised Aidan Goggins, BPharm, MSc NutrMed, Pharmacist, Medical Nutritionist and author, who sits on the FutureYou Cambridge advisory panel.

Dr Glenville went on: "Fish, particularly those found in the cold waters such as salmon, herring and mackerel, are high in omega 3 essential fatty acids. Omega 3 essential fats help to lower triglycerides and LDL cholesterol, thinning the blood and raising HDL cholesterol, as well as protecting the blood fats from oxidation.

"Frequent consumption of nuts has also been associated with a

reduced risk of coronary heart disease. Nuts are also a source of essential fatty acids, minerals and other beneficial nutrients. Previous studies have shown that ingestion of nuts, particularly walnuts or almonds, may lower serum cholesterol levels.

"Also, avoid any foods where the label says hydrogenated or partially hydrogenated vegetable oil then it can contain trans fats. Trans fats increase the risk of heart disease and they increase LDL and decrease HDL. Research has shown that by increasing consumption of trans fats by just two per cent, it increases the risk of heart disease by 30 per cent⁴." Gorman turned her attention to the crucial role magnesium plays with



regard to the heart.

"Magnesium is a critical mineral that plays a role in the prevention of heart and circulatory disease, yet figures show that around 50 per cent of the Western population do not get enough. This is mainly due to the magnesium content of our food, which is much lower than it was 50-100 years ago, primarily due to modern farming methods and food processing," she advised.

"Low magnesium levels have been linked with CVD disorders such as high blood pressure, AFIB, blocked arteries and cardiac arrests. Magnesium also plays a key role in relaxing the blood vessels to help the blood flow more freely, and low magnesium can play a role in angina, where the coronary arteries are constricted.

"Magnesium also works closely with vitamins K2 and D3 to support proper calcium metabolism, and this is vital for heart health to prevent the deposits of calcium in the blood vessels. With regards to K2, in particular, we are seeing lots more research coming out now in relation to its role in cardiovascular health. For example, adequate K2 has been shown to lower the risk of blood vessel damage by activating MGP, which inhibits calcium from depositing on the vessel walls. Likewise, low MGP can lead to the potential calcification of blood vessels, which can be used to atherosclerosis."

There are other considerations to make too, with Dr Glenville

suggesting: "A review of the beneficial effects of soya confirm that it helps to reduce cholesterol and triglycerides and raises the beneficial HDLs. Soya beans are high in phytoestrogens, which have an antioxidant effect and phospholipids, namely lecithin, which help to escort unwanted cholesterol out of the arteries and stop too much entering in the first place.

"For thousands of years, people have been aware of the beneficial properties of garlic, including its ability to reduce cholesterol levels and protect cholesterol from oxidation. Garlic has also been found to thin the blood, preventing the arteries clogging up due to the formation of blood clots. Most studies have found benefits from taking anything from one to three cloves daily. While this dietary addition is clearly beneficial, not everyone is keen on this idea. For this reason, garlic may be taken in supplement form. Hawthorn for good blood pressure, L-arginine and L-carnitine in plant form for healthy heart function and D-ribose, which supplies heart cells with energy."

Dr Gowland went on: "We know that as we age, we tend to absorb nutrients less effectively too. In addition, data from many global food intake, diet and nutrition surveys, shows clearly that the majority of the over 50s are deficient in many key nutrients, some of which are essential for maintaining the health of our cardiovascular system. The lack of omega 3 fatty acids is a good example of a heart healthy nutrient that the vast majority of us are failing to ingest from diet alone and therefore supplementation with a good quality supplement, high in omega 3, DHA and EPA, can contribute to a healthy heart. Other nutrients such as thiamin have also been found to be essential too and have a clinically proven track record of helping to protect heart health in general."

Goggins continued: "In 2004, the PolyMeal was proposed, which researchers claimed could compete with any heart drug combination. Simply eat a meal a day containing the seven foods; dark chocolate, red wine, oily fish, nuts, garlic, fruit, and vegetables and you would slash cardiovascular disease by more than 75 per cent. While this publication was very much speculative, in 2013, one of the best ever nutrition studies, Predimed, was published. Tested in almost 7,500 individuals, a polyphenol-rich Mediterranean diet containing many of these foods reduced heart disease by 30 per cent over five years versus a conventional diet."

He went on: "Cocoa flavanols are well documented to increase heart health by increasing flow mediated vasodilation at a minimum intake of about 100mg catechins. While dark chocolate offers the appealing way to achieve these benefits, the unfortunate truth is that most are processed in such a way that their flavanol content plummets."



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COENZYME Q10 EXPLAINED

One of the most critical nutrients for the heart is coenzyme Q10, yet the older we get, as arguably our risk gets higher, levels can fall.

Brogan advised: "Not only does it demonstrate antioxidant properties, including the reduction of oxidation of cholesterol, coenzyme Q10 has been shown to reduce the incidences of cardiac events and support the heart. In the major study, Q-Symbio, coenzyme Q10 supplementation was shown to reduce adverse cardiac events by 43 per cent compared to placebo.

"Coenzyme Q10 is used in the electron transport chain to support energy production and is used by the busy organs of the body, especially the heart. The saturation of our Q10 decreases as we age, meaning supplements can be really useful. Use of statin medication has also been shown to reduce our Q10 levels and in one particular trial, use of atorvastatin for 30 days was shown to reduce blood Q10 levels by 51 per cent. Adjunctive supplementation of Q10 would therefore be a recommendation to help replace this."

Dr Gowland added: "Coenzyme O10 is involved in cell energy metabolism, but levels decrease within the mitochondria. which are the cells' internal energy producing 'batteries'. Ageing also speeds up loss of CoQ10. As the heart is very energy intensive, maintaining levels of CoQ10 are important for general heart health. Many cardiologists in the know use CoQ10 together with statin therapy, which, unfortunately, tends to erode CoQ10 levels over time, giving rise to a long list of negative effects. Also, there have been countless clinical trials showing that CoQ10 supplementation following heart failure, can significantly reduce mortality in those patients."

VITAMIN FOCUS

Certain vitamins are really important for a healthy heart.

Dr Glenville advised: "High levels of homocysteine in the blood have been shown to increase the risk of damaging the lining of the arteries, which can contribute to heart disease and stroke. It is important to have good levels of vitamin B6, B12 and folic acid (as the active methylfolate) in order to keep homocysteine low."

Gorman added that supplements are to be considered, commenting: "With vitamin K2, for example, the typical western diet is low in natural sources, such as natto, the fermented soya bean, or animal foods, such as cheese and liver. We can convert some K2 from K1 from foods such as green leafy veg, but again, it may not always provide enough. Therefore, it is becoming more common now to recommend a K2 supplements in practice, especially alongside D3 as they are important co-factors for calcium metabolism, and subsequently heart health."

And Dr Gowland added: "Blood health is often omitted from the discussion on CV disease, which is strange as managing blood health with the right nutrients can make a significant difference to overall CV health. Take, for example, simple nutrients such as vitamin C, which helps with collagen formation in blood vessels, and a number of other ingredients such as riboflavin, iron and relevant B vitamins, which help replenish new healthy red blood cells.

"The synergistic B vitamin trio complex (B6, B12 and folate) can also form part of a

supplementation regime to control normal homocysteine levels in the blood, high levels of which have been associated with heart disease later in life. Another newer and cutting-edge vitamin (vitamin K2 or menaquinone) has also been shown in trials to not only support bone health, but also CV health too, by removing calcium from arterial plaques and depositing this calcium back into bone, which is where it belongs."

Dr Gowland also highlighted the mineral, chromium, commenting: "Around five million adults in the UK are diabetic, with millions more being pre-diabetic and, therefore, sugar (glucose) management within the blood is critical for health. Ensuring that adequate chromium is present is therefore important due to its involvement in the maintenance of normal blood glucose levels in the blood.

"Every cell in our body is under constant attack by free radicals, which the scientists call oxidative stress. Once arterial plaque becomes oxidised, that is when an inflammatory cascade can cause the plaque to become even more 'sticky', potentially leading to larger and more serious plaques and even clots. Selenium and vitamin E are powerful antioxidants which reduce oxidative stress and can help protect our cells against this ongoing damaging oxidation. Other well-known antioxidants such as green tea, grape seed, resveratrol and alpha-lipoic acid are used in some high quality formulations."

RESEARCH UPDATE

Evidence continues to build around the nutrition and the heart, with Dr Glenville commenting: "Recent research is suggesting that influencing the gut microbiota could be associated with heart heath. A study of diets rich in 2020 looked at the effects of a diet naturally rick in polyphenols and/or omega 3 fatty on gut microbiota composition in people with a high cardiometabolic risk. This type of diet was shown to have beneficial effects on both glucose and lipid metabolism⁵."

Gorman added: "There has been a lot of research taking into account the macronutrient content of our diets and how this can affect overall CVD risk factors. But interestingly, we have also seen many studies looking at micronutrients, such as polyphenols, and how these can exhibit heart protective benefits.

"Numerous studies have suggested that they can exert their positive effect in a number of ways, such as by delaying the progression of atherosclerosis, reducing inflammation, increasing NO production and a reduction in BP, as well as improvements in lipid metabolism and blood viscosity."

And Goggins went on: "A massive breakthrough in nutrition and health occurred when the REDUCE-IT study was published. Here, a purified omega 3 product was convincingly shown to reduce the occurrence of cardiovascular events like heart

attack or stroke by 25 per cent in high-risk patients, already on statins, without side effects. The omega 3 product is now approved by the FDA and expected to be a blockbuster drug, proving once and for all nutrients can be as powerful, if not more so, than conventional drugs."



EXPERT ADVICE

CLICK HERE FOR REFERENCES

Our panel of nutritional experts offer readers advice on dealing with a variety of issues.

Can you explain how CBD and gaba amino acids can be beneficial to recommend for clients with sleep problems?

PAUL HEMBERY ADVISED: GABA is a naturally occurring amino acid that facilitates communication between our brain cells. Over 40 per cent of neurons have a GABA receptor, and the primary role of this amino acid is to slow down our brain activity, helping to keep us relaxed and calm. It is for this reason that it can be beneficial for those who do have sleep problems.

The issue is that GABA is hard to get naturally from food, as it is only really found in some fermented products like yoghurt and kefir. Certain drinks like red wine and green, black or oolong teas contain flavonoids, which can influence how GABA works in the brain.

CBD (cannabidiol) acts as a natural sleep aid because of the way it interacts with our ECS (endocannabinoid system). This cell-signalling system helps to regulate sleep, mood, and other bodily functions. In a recent study¹ of 72 patients, 66.7 per cent reported improvements in their sleep in the first month and a further 79.2 per cent said their anxiety was reduced. With anxiety playing a big part in troubled sleeping, it is easy to see how it can be beneficial to those who do struggle to nod off.

What's more, GABA also helps to reduce anxiety; when our brains go into 'fight, flight or freeze' mode, our brain produces the hormone, cortisol. The production of this hormone negatively impacts our ability to fall asleep and stay asleep. GABA and GABA receptors assist the body in stopping this stress response and help to promote feelings of relaxation.

Supplementing GABA is possible, however, when taken alone, these supplements struggle to penetrate the blood-brain barrier. This is why it's recommended to take GABA that's enriched with CBD, as it helps to activate the GABA and the receptors in your brain, allowing the supplement to work better, with the effects of both enhanced. It is important when looking for an enriched GABA supplement that you do your research and recommend ones that are combined with pure CBD and not THC, as THC products can actually have the reverse effect.

When combined, CBD and GABA are highly effective at promoting sleep, and help to reduce feelings of anxiety and stress.



Can you detail the significance of diet and supplementation in addressing acne?

JOANNA DZIEDZIC EXPLAINED: Our skin is continuously exposed to internal and external influences that may alter its condition and functioning. As a consequence, the skin may undergo alterations, leading to imbalanced epidermal homeostasis and skin disorders. Modern nutritional science is developing new insights into the relation between food intake and optimal skin condition.

Acne is probably the most common dermatological condition seen in clinical practice. Although the pathologic mechanisms are not very well understood, prevalent factors involved in acne include excessive sebum production, hyperkeratinisation of the hair follicle, oxidative stress, follicular colonisation with *Cutibacterium acnes* (formerly *Propionibacterium acnes*) and the release of inflammatory compounds.

Epidemiological studies have shown that the incidence of acne is significantly lower in non-industrialised societies than in Westernised populations. Moreover, several studies have noted that, as these populations made their transition to modern life, either through a local cultural change or relocation, adopting a Western diet, the prevalence of acne increased to similar ranges as in Western societies.

According to Burris et al., acne severity in a cohort of New York young adults was associated with: increased intake of sugar (high glycaemic load), number of milk servings per day, and amount of saturated fat and trans-fatty acid (TFA) intake. It is important to realise that it is not the IGF-1 content of cow's milk that exaggerates serum IGF-1 levels of the milk consumer, but the milk-driven hepatic production of IGF-1 by the transfer of amino acids that promotes IGF-1 synthesis in the liver of the milk recipient. It's worth mentioning that BCAAs (leucine, isoleucine, and valine) found in milk induce pancreatic insulin secretion.

There is good reason to assume that genetic predispositions to acne increase the 'acnegenic' responsiveness to the Western diet. Individuals with persistent insulin resistance, hyperinsulinemia, and hyperandrogenism, such as women with polycystic ovary syndrome (PCOS), will exhibit increased responsiveness to the 'acnegenic' signals of Western diet.

There are some data that show the beneficial effect of

supplementation in supporting the treatment of acne vulgaris. Omega 3 fatty acids show to inhibit the conversion of arachidonic acid into LTB4 – sebum regulating substance. EPA and DHA fatty acids can inhibit production of LTB4 and prevent inflammatory processes downregulating TNF- α and lowering IGF-1 levels.

Resveratrol, the polyphenolic flavonoid from grapes and red wine, inhibits the growth of *P. acnes* and plays an important role in the pathogenesis of acne.

Chromium not only helps to improve insulin sensitivity and regulate blood sugar levels, but it also supports the conversion of linoleic acid within the skin, which presumably has a favourable effect.

An eight-week trial of nicotinamide 750mg daily, zinc 25mg daily, copper 1.5mg and folic acid 500mcg reported a significant improvement in acne severity with treatment.

Another 12-week study in adults with acne found that vitamin B5 2.2g daily reduces total lesion count and inflammatory blemishes.

One study examined the effect of daily supplementation of selenium (400mcg) and vitamin E (20mg) for 12 weeks in acne. This combination led to improvements, especially in patients with low baseline glutathione peroxidase activity.

The ideal 'antiacne diet' will be a palaeolithic-like nutrition with accentuated intake of vegetables and fruits with low glycaemic index and fish rich in anti-inflammatory ω 3-fatty acids. Beneficial and acne-preventive nutrients should contain plant-derived natural mTORC1 inhibitors, such as green tea (EGCG), resveratrol, curcumin, and silymarin.

The psychological impairments in acne include higher rates of depression, anxiety, anger and suicidal thoughts. An overlap may exist between nutrients that potentially have both anti-acne and mood regulating properties; examples include omega 3 fatty acids from fish oil, chromium, zinc and selenium.

Although there are still many unknowns in this area of dermatology and further investigation is needed before any recommendations can be made, the existing research is extremely promising and delivers further interest and hope for clinicians, as well as acne sufferers.





ABOUT THE EXPERT

Joanna Dziedzic is a qualified Nutritional Therapist with experience in high-end consultancy, training other healthcare professionals and clinical practice. She has a passion and interest in natural approaches to supporting complex health issues and improving vitality and wellbeing. Joanna is a Business Development Manager for Pure Encapsulations UK, a leading nutritional health science company.



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The undiscussed deficiency

Selenium supports the immune system, but we're not getting enough. Here, Nutritionist, Frank Brogan, discusses the best way to address the issue.

ecent statistics have shown that UK intakes of the trace element, selenium, are low in a large proportion of the population. The impact of this on human health could be wide reaching, including decreased cognitive function, tiredness, poor skin and nails and worryingly, a weakened immune system.

It's because of selenium's wide reaching health implications, including its actions in our immune response, that selenium supplements are now finding themselves being introduced into immunity protocols within the UK and Europe. So, where do we get selenium from and why are intakes so low?

Natural variation

Selenium is often concentrated in red meat and dairy products, whole grains, nuts and seeds – though how much selenium these foods actually end up containing is highly variable on the soil quality they were grown from (or grazed on). Selenium enters the food chain via the soil. With low-selenium soil, crops that grow there and livestock that graze there, will also be low in selenium, contributing to low selenium status of the local population.

Geographical distribution of selenium around the world varies somewhat dramatically between different

countries. Areas such as Greenland and parts of the USA demonstrate high levels of selenium, while Europe and the UK are generally selenium-poor. Research shows these levels are dropping further, with climate change and agricultural practices being cited as contributors.

A recent analysis of UK statistics shows that selenium intakes in the UK are significantly low, with 50 per cent of women and 26 per cent of men consuming less than the lower reference nutrient intake (LRNI), which is widely considered inadequate for good health.¹ Additional studies show that vegetarians/vegans are more likely to be deficient in this essential nutrient.²³

Selenoproteins

Once absorbed, the body utilises selenium to produce selenoproteins. These selenium-dependant compounds are important for a wide range of functions in the human body, including immunity, thyroid function and even healthy hair and nails. Involved in our immune response, the selenoprotein glutathione peroxidase (GPx), is responsible for production of the most important antioxidant available to the human body, glutathione. As an antioxidant, glutathione is able to help bolster the immune response by neutralising reactive particles known as free radicals, a well-researched driver of disease. SCI (ATTIUI) 78.96

Selenium's antiviral capacity

Selenium depletion occurs in the body during a viral infection, even though the body has great demand for it.¹

Viruses produce reactive particles known as reactive oxygen species (ROS) when they infect the body, which, in excess, cause oxidative damage to bodily cells. Recent research also shows that these ROS can speed up reproduction or certain virus types and decrease the effectiveness of the body's immune response.⁴ Fortunately, these ROS can be neutralised by adequate glutathione, decreasing cellular damage and improving the overall immune response.

In a study published in *Advances in Nutrition*, selenium supplements were shown to improve immune responses in the case of various virus types, including influenza type A, poliovirus and hepatitis C.⁵ In a separate trial, poultry given selenium-yeast supplements were shown to have improved antiviral defences and be more resistant to avian influenza (H9N2).⁶ Authors of these studies suggest that selenium supplements have a place in the therapy of viral infections, alongside traditional treatments.

Selenium and Covid-19

Selenium's immune supporting potential has even been associated with the current Covid-19 pandemic. In a recent review published in *Frontiers in Nutrition*, the authors outline the rationale for selenium supplement use in those considered high risk of Covid-19, especially the elderly.⁷

In a separate study, a dramatic link was made with selenium status and Covid-19 outcomes. The study, published in the *American Journal of Clinical Nutrition*, discussed how there was a significant link in selenium status and Covid-19 cure rate (in this context, 'cure' refers to being free of symptoms consistent with SARS-CoV-2 infections).⁸

The main mechanisms discussed for selenium's immune support include the protection of cells from oxidative stress during infections. Authors of these studies also proposed that selenium supplementation offers a low risk, easily accessible option for immune support.

Beyond immunity, selenium research has linked the element to a wide range of other areas of health.

Selenium in cardiovascular disease

Featured in the trial, KiSel-10, selenium supplements (combined with coenzyme Q10), have been associated with the reduction of major adverse cardiovascular events (such as heart attacks) by 54 per cent and reductions in levels of NT-proBNP, a peptide used to predict heart stress and heart failure.

This indicates that when combined with Q10, selenium supplements may help support heart function and reduce risk of cardiovascular related mortality $^{9}\!.$



Atherosclerosis

Selenium has been shown to interrupt integral mechanisms to the development of atherosclerotic plaque, which is considered a leading cause of heart attacks and strokes. In a 2003 review published in *Antioxidants*

and Redox Signalling, selenium was shown to reduce plaque build-up through the action of glutathione peroxidase. By stimulating the antioxidant glutathione, GPx inhibits the oxidation of LDL cholesterol, preventing a degree of vascular inflammation.¹⁰

Thyroid function

Selenium contributes to normal thyroid function and this is primarily due to two selenoproteins: glutathione peroxidase (and subsequently, glutathione) and iodothyronine deiodinase.

The thyroid gland is known as the primary mediator of endocrine activity in the body and is actually the most selenium rich component of the body. In the process of hormone production, the thyroid gland produces a high level of ROS. To limit oxidative stress and damage to the thyroid, glutathione is present to neutralise free radical activity.

The thyroid produces thyroxine (T4), which converts to the more active triiodothyronine (T3). lodothyronine deiodinase is needed for this conversion, a lack of which may result in thyroid dysfunction with symptoms such as tiredness, depression and weight gain.

Fertility and pregnancy

Selenium contributes to normal spermatogenesis, supporting sperm production and male fertility. In a 2009 study, men receiving 20µg of selenium daily had significantly increased total sperm count and motility compared to those taking a placebo.¹¹ Studies also show that selenium may decrease symptoms of postpartum depression, and a particular study (known as SPRINT) conducted in the UK showed that SelenoPrecise reduced the risk of pre-eclampsia, a condition that can cause raised blood pressure and seizures in pregnancy.¹³

Selenium-yeast: Our best option?

Selenium supplements are available in two forms; inorganic (such as sodium selenite and selenate) or organic types, such as selenium-yeast. The major difference between the two types is that the organic variant contains a wider range of beneficial seleno-compounds, important for the eventual production of immune-supporting glutathione and related selenoproteins.

Most selenium supplements are in the inorganic form. However, scientific evidence suggests that only about 50 per cent of an inorganic supplement actually gets absorbed by the body. Selenium-yeast, however, is shown to be much more effective, with a particular type (the pharmaceutically produced SelenoPrecise) shown to have absorption as high as 88.7 per cent¹⁴, the highest recorded for selenium supplements.

Selenium immune support

Selenium supplements are placed to be a safe, effective and easily accessible option for supporting the immune system at a time when we need it most. Knowing that a significant proportion of the UK population is low in the vital trace element, considering appropriate supplementation has never been more important.



Frank Brogan has spent more than 12 years working in the nutrition and wellness industry, including clinics, private consultancy and health stores and his areas of expertise include nutritional supplements/ nutraceuticals. As a Registered Nutritionist (AfN), Frank takes an ethical, practical and evidence-based approach to nutrition and wellness. He is Senior Nutritionist at Pharma Nord. ³⁴Se Selenium

Quality without COMPTISE

With Patrick Holford heading up the formulation team, utilising his rich heritage in nutrition, HOLFORDirect is a leading supplement brand in the practitioner market. Here, the brand explains what drives the development of the products, and what practitioners can look forward to in future.

atrick Holford is a well-known and long-established name in the nutritional world, and his many years of experience in the field makes him ideally placed to lead the formulations of the HOLFORDirect brand.

Having been in existence for four years, this brand offers the market a unique point of difference in terms of the product focuses, as well as being innovative when it comes to developing new products.

Ros Lincoln, HOLFORDirect's Account Manager, explained that the brand is going from strength to strength, adding: "It enjoys significant brand authenticity that continues to grow. We're fortunate to have pioneer nutritionist, Patrick Holford, still leading on product development, working with a product development team with decades of experience."

And it's certainly been a busy time for all involved in the brand, especially during 2020 and the Covid-19 pandemic.

"Patrick Holford has gained massive social media traction throughout, having constantly campaigned to highlight the undeniable health and immunity support that high-level intakes of vitamin C can achieve," Ros explained. "There has been increased interest in supplements since Covid-19 hit, in particular, supplements like our Optimum Nutrition Formula and vitamin C and zinc, which is in our ImmuneC product."



HOLFORD



LEADING INNOVATION

The brand has always been focused on innovation, and on bringing genuine new products to practitioners that fill both a gap in the market and a need for such a product.

"Our R&D programme is focussed on adding supplement lines that will extend and/or enhance the key ranges. Patrick Holford has invested his time, experience and limitless energy in, namely daily essentials, mind, metabolism, body and female health. NPD formulations are then developed in accordance with his aim of combining synergistic nutrients – always with the aim of making supplement choices easier for the consumer," Ros explained.

At the core of the ranges is the hugely popular multivitamin, Optimum Nutrition Formula, part of the Essentials range. This set of supplements was designed to support the best possible general health and wellbeing, ideally taken on an ongoing basis.

Drawing on his vast knowledge and experience, Patrick formulated the other ranges (Mind, Metabolism, Body, Female) to help those who need extra support in an area of their health and wellbeing, for example, mind health or digestive issues. Most of the supplements in these ranges were developed to be taken alongside the Essentials, until



the extra support is no longer needed.

In recent times, ImmuneC High Strength Powder has been developed as an extension of the hugely popular ImmuneC.

"This vitamin C powder is ideal for rapid recovery as it can be taken in flexible amounts in a drink," Ros explained, adding: "Last year, we launched a range of products to support the innovative Holford Hybrid Diet and 5 Day Diet – both diets have a ketogenic focus that requires the body to go into autophagy for improved health and healthy weight-loss."

And this focus will continue for the future as Patrick continues to work on new formulations.

Ros confirmed: "We have some exciting new products in the pipeline for 2021. One of these is Glucosamine with Theracurmin and Quercetin to support the health of joints and bones. This will be an effective all-round combination of ingredients for dealing with inflammation and sore arthritic type joints – all in one capsule. It uses the clinically trialled Theracumin, proven to be superbly absorbed by the human body, and quercetin, one of the best anti-inflammatory ingredients available."

Catering to the growing vegan market is also a big focus, both from a product perspective, but also with the launch of Patrick's latest book, *Optimum Nutrition for Vegans*.

"We are currently awaiting Vegan Society accreditation for all our relevant products and are on schedule to have this certification by early 2021," Ros revealed.

BRAND PRINCIPLES

In terms of what makes the HOLFORDirect brand unique in a busy marketplace, Ros points out there are various facets to take into account.

She commented: "Many of the products in the Patrick Holford range have been on the market for over 20 years and have a loyal customer base. The Essentials range is well-known for containing the optimum levels of nutrients – without compromise. The health packs also have supplements in blister strips to take on the go.

"Most products in the ranges combine at least three nutrients working together in synergy. So, Patrick has done all the hard work for the customer. The products have easy to understand names and labelling, making it easy and quick for customers to understand product function, and the benefits to them."

And in terms of quality, such as how the products are manufactured and the raw materials used, how does the brand ensure its standards remain high?

"The supplements market has grown exponentially in the past two decades, with an extensive amount of choice, but Patrick's formulations have remained consistent to their original values, fulfilling Patrick's main tenet of optimum nutrition without compromise," Ros commented. "All are made in the UK in an ISO Class 8 Cleanroom and conform to the highest industry standards. Only the best ingredients are sourced, and most are suitable for vegetarians and vegans."

Driving these brand principles forward is a dedicated team. Ros commented: "Although HOLFORDirect is a relatively young

company, our senior management and technical team have 65 years of combined industry experience and with Patrick's experience, we have a pool of over 100 years' of knowledge within the team."

And looking ahead, what can we expect from this innovating brand? "Patrick Holford is a fantastic educator and with live events now on

hold, he is providing a webinar each month on a variety of topics. On January 6, he hosts 'How to lose weight and reset your metabolism', covering both his Low GL Diet and his 5 Day Diet. He also has a monthly podcast at www.patrickholford.podbean.com/," Ros explained.

"The podcast was set up in response to all the fake news and confusion about the best advice for nutrition and optimum health. The podcasts focus on scientific research and latest developments in a range of topics from brain health to immunity – in discussion with leading health experts – giving 'real' information.

"HOLFORDirect focusses on offering a personal experience to customers, especially by email and on the phone. In 2021, the longstanding and dedicated customer services team is now joined by new members of staff to ensure this service can continue as the business grows. This will be complemented by an improved and mobileoptimised website."

Recipes that give back

Leading chefs have teamed up for the new recipe book, *Beder's Kitchen*, to support a charity raising awareness around mental health and suicide prevention.



Black rice with coconut, banana and toasted almonds Butternut squash mac 'n' cheese Raw chocolate cheesecake



Black rice with coconut, banana and toasted almonds – by Niamh Shields

This black rice feels like a real treat for breakfast. I usually have it at weekends when I have more time, but it is perfect at any time, and it is also a superb afternoon treat. Enjoy!

Serves 1

Preparation time: 5 minutes, plus overnight soaking Cooking time: 30 minutes

Ingredients: For the black rice:

- 50g black sticky rice
- 150ml water
- 160ml tinned coconut cream
- 1tsp honey (or to taste)

To serve:

- 1 banana, peeled and sliced (optional)
- 1tbsp chopped toasted almonds

Method:

First, soak the rice overnight and rinse thoroughly under the cold tap the next day. If you forget to soak it, rinse it a few times and you will be good to go.
Cover the rice with the water in a small pot with a lid,

- then cook gently over a medium heat in a lidded pot for 15 minutes, adding more water little by little if you need to. When the rice has absorbed the water and is softening but still has bite, add two tablespoons of the coconut cream and honey to taste. Put the lid back on the pot and set aside until ready to serve. • Heat the remaining coconut cream over a medium heat and reduce it until it is nice and thick.
- Serve the black rice warm (don't let it sit too long or it will get soggy) with the thickened coconut cream, sliced banana and toasted almonds on top.

Tip: If you haven't had black sticky rice before, have a look for it in the Thai section of Asian supermarkets. When cooked like this, it's a bit like rice pudding but deeper and richer. This adds a feeling of decadence and it is perfect with most fruits so use what is in season, or just slice a banana on top as I've done here. I like to add a sprinkle of chopped toasted nuts after the fruit for texture and flavour. My favourites are hazelnuts, pistachios and almonds. If I'm making this in autumn, I like to add some plums lightly stewed with a stick of cinnamon to serve on top of the rice. Stewed apple would be lovely too, and rhubarb in season is a joy, but the best thing to have on this rice is your favourite fruit, whatever that is, or even just add your favourite jam.





Butternut squash mac 'n' cheese - by Amy Lanza

A warming, comforting bowl of the classic with a plantbased and healthier twist. The sauce is thick, creamy, flavoursome and vibrant with added vegetables; a great meal to show off how vibrant, wholesome and delicious vegan food can be.

Serves 2

Preparation time: 10-15 minutes Cooking time: 1 hour

Ingredients:

- For the sauce:
- 1/2 a butternut squash (200-250g flesh)
- 4tbsp plant-based milk
- 2tbsp tahini or olive oil
- 2tbsp nutritional yeast

 ${\boldsymbol \cdot}{\boldsymbol \prime}{\boldsymbol \prime}$ tsp each of smoked paprika, ground turmeric and Dijon mustard

For the pasta:

- Olive oil
- 1/2 white onion, finely diced
- 1 small courgette, finely diced
- 2 cloves of garlic, crushed
- 1tbsp tamari
- 180g pasta of your choice
- 160g frozen peas
- 1 handful of spinach, chopped
- 10 cherry tomatoes, halved

For the 'cheesy' topping:

- 1tbsp shelled hemp seeds
- 1tbsp nutritional yeast
- ¼ tsp turmeric

BLACK RICE WITH COCONUT, BANANA AND TOASTED ALMONE

Method: For the sauce:

• Preheat the oven to 180°c fan and line a tray with baking parchment.

• Place the butternut squash cut side up on the tray and drizzle with a bit of olive oil. Roast in the oven for 40-50 minutes or until tender and starting to brown at the sides. Remove from the oven and allow to cool.

• Scoop out and discard the seeds, then scoop out the flesh and place it in a food processor with the remaining ingredients. Blend until smooth, scraping down the sides as necessary and seasoning to taste.

• You may need to add a splash more milk to make a runnier sauce. This can be made up to two days in advance when kept cool in an airtight container in the fridge.

For the pasta:

• Heat a good drizzle of olive oil in a saucepan and fry the onion for 10 minutes until caramelising and translucent. Now add the courgette and garlic and continue to fry for five to seven minutes until cooked through, adding the tamari for the last minute.

• Meanwhile, cook the pasta according to the packet instructions, adding the peas for the final five minutes. Drain, reserving some of the cooking water, and leave to one side.

For the 'cheesy' topping:

• Make the topping by mixing all the ingredients together in a bowl. Season to taste.

• Return the cooked pasta to the saucepan then add the onion and courgette mixture, chopped spinach, tomatoes, butternut sauce and four tablespoons of the cooking water. Stir the pasta over a low heat until creamy and well coated in sauce, adding more cooking water if required.

• To serve, divide the pasta between two bowls and sprinkle over the 'cheesy' hemp topping.



AW CHOCOLAI CHEESECAKE



Beder's Kitchen is a collection of recipes and reflections from amazing foodies around the world, including Gordon Ramsay, Yotam Ottolenghi, Judy Joo, Romy Gill, and Carla Henriques to name a few. It is also an initiative to raise awareness around mental health and suicide prevention, launched by the young charity, Beder. Razzak Mirjan and his family set up Beder in honour of his younger brother, Beder Mirjan, who sadly took his own life at the age of 18 in 2017. Beder's Kitchen, published by Meze Publishing, £22.

Raw chocolate cheesecake – by Naomi Buff

Recipes like this have changed my relationship with chocolate and I have also transformed the attitudes of many others with my raw chocolate treats; they can be life changing!

Serves 8-10

Preparation time: 20 minutes, plus 2-3 hours setting

Ingredients:

For the base:

- 140g almonds
- 40g oats
- 2tbsp raw cacao powder
- Pinch of salt
- 12 pitted Medjool dates (200g)
- ¼ tsp vanilla powder or essence

For the filling:

- 120ml coconut milk, chilled for about 4 hours
- 2 large ripe avocados
- 60ml maple syrup
- 20g raw cacao powder
- ½ tsp vanilla powder or essence
- Pinch of salt

For the chocolate sauce:

- 2tbsp raw cacao powder
- 2tbsp melted coconut oil
- Pinch of salt

Method:

For the base:

• Grease a 20cm loose-bottomed cake tin with a little bit of coconut oil. If you are using a silicone mould of the same

size, there's no need to grease it.

Put the almonds, oats, cacao powder and salt into a food processor. Blend until the nuts and oats have broken down.
Add the dates and vanilla, then blend again until the dates have broken down and you have a sticky mixture.
Transfer just over half of this mixture to your cake tin and press down firmly with the back of a spoon or your fingertips to create the base.

• Spoon the remaining mixture around the edges of the tin and use your fingers to press upwards from the base, creating sides about 2.5cm in depth from the base. Use a spoon to neaten the top of the crust.

For the filling:

Make sure your coconut milk has been in the fridge for about four hours, so it solidifies. Halve and destone the avocado, scoop out the flesh and put it into the food processor with all the other ingredients.
Blend until completely smooth and creamy, then spoon the filling into the base.

For the chocolate sauce:

• In a small bowl, mix the ingredients together until fully combined, then drizzle the chocolate sauce on top of your cheesecake.

Finish by decorating it with chopped nuts, dried fruit, edible flowers, cacao nibs or anything else delicious, colourful and edible you can find in your cupboards.
Pop the decorated cheesecake into the freezer and leave it to set for about two hours, or three hours in the fridge, and it should be ready to eat. You can either keep this stored in the freezer for up to three months (it will need a little bit of defrosting before eating) or in the fridge for up to five days. If you used a silicone mould, you will need to completely freeze the cheesecake to remove it from the mould cleanly.

BLACK RICE WITH COCONUT, BANANA AND TOASTED ALMONDS



BUTTERNUT SQUAS MAC 'N' CHEESE

I-Maggiveaways



We showcase a selection of giveaways on offer to readers this issue.

Mullein

iscover Nature's Answ

Ruten-Free

Nature's Answer Mullein Leaf Liquid Herbal Extract

Nature's Answer Mullein Leaf Liquid Herbal Extract is an alcohol- and gluten- free super-concentrated extract with the herbal equivalent of 2,000mg of mullein leaves per serving. Nature's Answer alcohol-free extracts are produced using a cold Bio-Chelated proprietary extraction process, yielding a Holistically Balanced Authentic Botanical Fingerprint extract in the same synergistic ratios as in the plant, which allows Nature's Answer to set standards for proving the authenticity of each herb. Using carefully controlled



I:Win: We have five to give away.



BIO-KULT GOODY BOX

What's your winter gut feeling? Win this fantastic goody box aimed at supporting your digestive and immune system, including Bio-Kult Advanced targeting the digestive tract, Bio-Kult Infantis with vitamin D3 for babies, toddlers and young children, Bio-Kult Boosted with vitamin B12, and Bio-Kult S. Boulardii with vitamin D3, both targeting the digestive and immune systems. We've also included a compact 'on the go' hand sanitiser key ring.

I:Win: We have one to give away.



Rio Health Stevia Tincture

Stevia, also known as sweet leaf, has been used for centuries in South America and in Ayurvedic medicine. This well-known natural zero-calorie sweetener is intensely sweet but does not cause insulin release. It can be used in hot drinks and recipes, as well as for therapeutic use. Rio Health Stevia Tincture is an ecologically wildcrafted 1:3 tincture of *Stevia rebaudiana* whole leaf provided with a calibrated dropper for easy dispensing and has no bitter aftertaste.

I:Win: We have three to give away.

TIME HEALTH ORGANIC LION'S MANE

Lion's mane is a powerful nootropic with significant cognitive enhancing properties. Recent research indicates that lion's mane has significant NGF stimulating effects, which have been linked to improved memory and overall brain health support. One of the only supplements of its kind on the market, this organic lion's mane contains only high quality, European grown, dual-extracted mushrooms. The product is 100 per cent vegan and, as with all Time Health products, contains no fillers, binders or additives.

I:Win: We have eight to give away.





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