

Nutrition I-Mag

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RESEARCH AND EDUCATION FOR TOMORROW'S PRACTITIONER

SUMMER 2024

LIVER HEALTH – THE LATEST

An expert guide to the health of this vital organ



Musculoskeletal management

Protocols for supporting
the joints and bones

Heart in focus

Nutritional support
for a healthy heart

PLUS: A GUIDE TO CHOLINE ■ DR TOM O'BRYAN CONFIRMED FOR IHCAN SUMMIT
■ THE LATEST RESEARCH NEWS ■ READER GIVEAWAYS ■ COOKING WITH SHALLOTS

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WELCOME



As we head rapidly into the summer months, for many of you as students, this may signal the end of your learning year, or the culmination of all your studies as you prepare your final assignments and to move onto the next stage of your nutritional therapy journey. But the approaching summer months also mark the first of our hugely popular in-person educational events with the popular IHCAN Summit taking place on June 22 at 155 Bishopsgate, London.

This event is a popular date in the educational calendar for both qualified practitioners as well as students, and this year, the event promises more of what we know attendees love – high quality education with prestigious, internationally recognised speakers including Dr Tom O’Bryan, Dr Leo Priumboom and Dr Malcom Kendrick, along with the opportunity to network with fellow practitioners in a positive, open and informative environment. And the event also allows delegates to meet with leading industry brands, discover new products and learn more about the latest developments in the world of nutritional therapy.

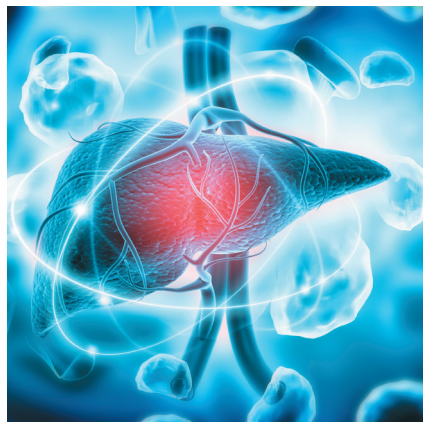
The IHCAN Summit also offers attendees the opportunity to earn valuable CPD points as the event is accredited by BANT, the NNA and ANP. Tickets are still available but are now limited; there are discounts available for students and can be booked by [clicking here](#).

Away from our forthcoming event, this issue of *Nutrition I-Mag* is packed full of educational material to help you further your studies and support your learning. First, we bring the focus onto liver health with our in-depth practitioner guide to supporting clients in this critical aspect of health. Our guide focuses on the most common factors that can affect the health of the liver in our modern world, and the protocols that can be recommended. Also in this issue, we turn the spotlight on joint and bone health, and on that of the heart, offering a better understanding on how best to manage the range of conditions that affect this organ.

And remember that *Nutrition I-Mag* is also CPD accredited, allowing you to earn further points. All you need to do is read the magazine and then visit www.nutritionimag.com to register your points.

Rachel

RACHEL SYMONDS, EDITOR



MEET THE TEAM

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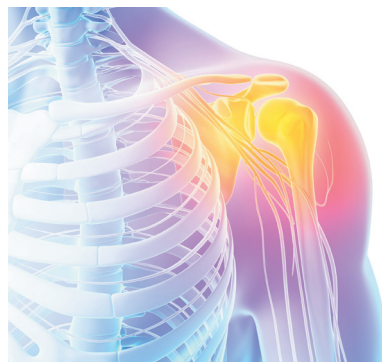
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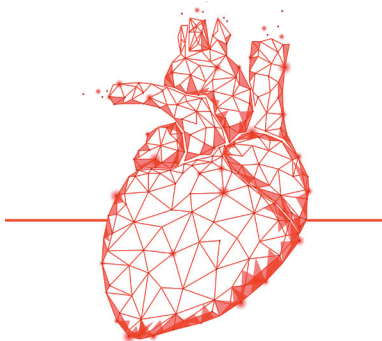
LIVER HEALTH

An in-depth guide to helping your clients support their liver health



JOINTS AND BONES

How your clients can ensure the long-term health of the musculoskeletal system



HEART FOCUS

Expert advice on the correct protocols when it comes to nutrition and lifestyle interventions for a healthy heart



RECIPES

Discover a selection of healthy dishes using the humble shallot



INGREDIENT FOCUS

The role of choline in a range of health functions

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We bring you up to date with the latest scientific news

PRODUCT WATCH

What's new to market?

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Dr Tom O'Bryan confirmed for IHCAN Summit

ASK THE EXPERTS

Nutritional experts answer your questions

NUTRITION I-MAG GIVEAWAYS

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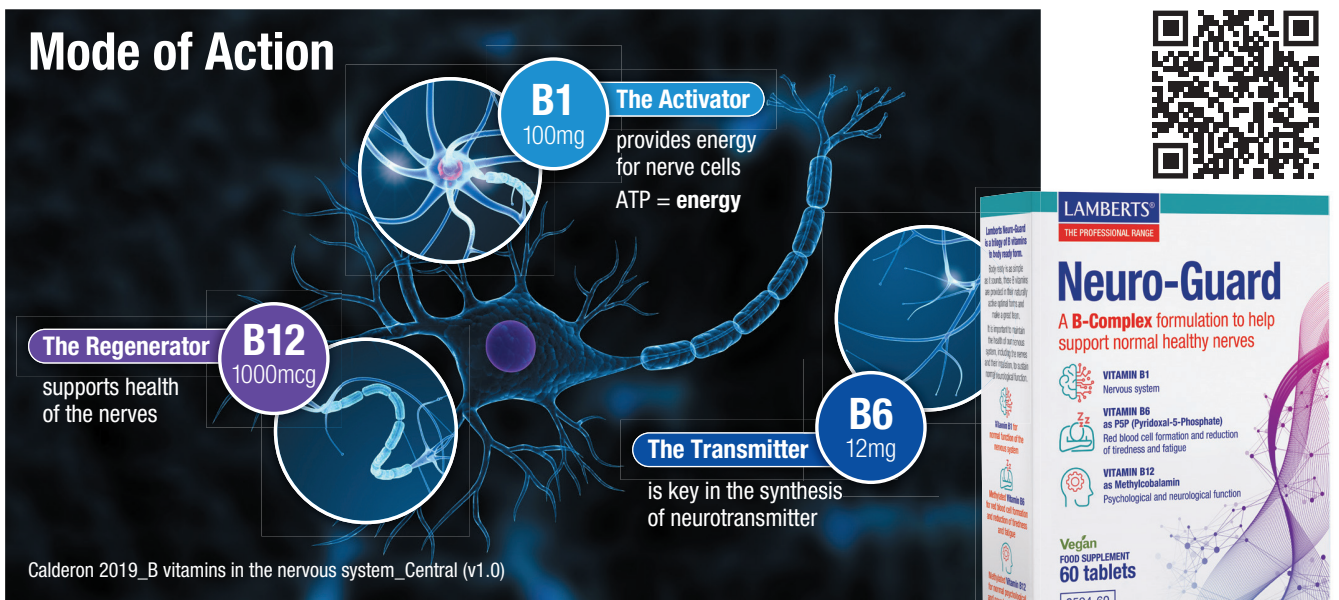
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OUR CONTRIBUTORS

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



RUTH TURNER

Ruth Turner PGDip Nutritional Therapy, mBANT, rCNHC, is a Registered Nutritional Therapist at Cytoplan. Ruth studied at the University of Worcester and has been a qualified Nutritional Therapist for almost 10 years. She ran a successful private practice before joining Cytoplan in 2018, where she works as an in-house Nutritional Therapist. Ruth has a particular interest in female and children's health and undertakes regular CPD in these areas to stay up to date with the latest research.



MARTINA DELLA VEDOVA

Martina Della Vedova (BSc, M.Sc, CNMDip NT, mBANT, CNHCreg) obtained a Master in Functional Genomics in Italy and trained as a Nutritional Therapist in London. She has worked for NaturesPlus as a Nutritional Advisor since 2016 and sees clients privately.



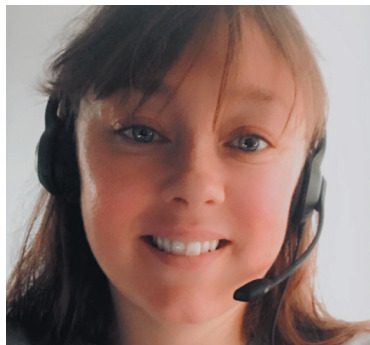
EMILY SIMPSON

Emily Simpson is a Nutritional Expert and Senior Product Development Technologist at BetterYou. A scientific scholar and first-class Biological Sciences graduate, Emily studied at Durham University before starting her career within the Product Development department at BetterYou. Assisting with the development and delivery of innovative, world-leading pill-free supplements, from concept through to launch, Emily plays a fundamental role in the brand's new product pipeline.



MAX LAMBERT

Max Lambert holds a PhD in Medicine from Aarhus University and has carried out clinical research into the effects of plant derived bioactive compounds on human health. He has a background in clinical research, health, nutrition, and food technology, with more than 15 human intervention studies and meta-analyses published in scientific peer reviewed journals. He has been Assistant Professor and Post Doc at the Department of Clinical Medicine at Aarhus University and is a lecturer for courses in Molecular Nutrition and Food Technology. He has been a member of the Nutrition Society in the UK.



KERI BRIGGS

Keri Briggs is Senior Nutrition and Technical Advice Specialist at Lamberts Healthcare. She graduated in 1999 with a BSc in Human Nutrition and has worked for Lamberts since 2000, where she has been involved with training, clinical trials and writing PR and trade articles, as well as advising trade customers and consumers.



ALICE BRADSHAW

Alice Bradshaw is a qualified Nutritional Therapist with a passion for health writing. She has worked in the natural health industry for more than 25 years and is Head of Education and Nutrition Information at Terranova Nutrition.

Understanding Gut Health with Doctor's Data's GI360 Profile

In this **new 6-week online course**, clinical experts from Doctor's Data will provide practical insight into testing methodologies and specific markers included in the comprehensive GI360 stool profile, and how to apply this knowledge in clinical practice.

Course start date: 29th May, 2024

Self paced learning, access to an exclusive discount and a closed group Q&A webinar with Doctor's Data and Regenerus' Clinical Education teams at the end of the course.

Already registered with Regenerus? Log in and **enroll now!**



Or, **create an account** with Regenerus to access the course*!



Here's a preview of the course modules:

1 Getting Started with the GI360: A Comprehensive Overview

We will discuss the indications and contraindications for testing, collection considerations, including probiotics and paediatric populations, testing methodology and frequently asked questions.

2 The Importance of GI Abundance and Diversity and Clinically Relevant Key Bacteria Identified by PCR

We will cover how measuring abundance and diversity by PCR methodology can reveal a patient's status of normobiosis vs dysbiosis, with special attention to clinically researched key bacteria.

3 Cultured Bacteria and Yeast and Direct Susceptibilities for Targeted Treatment

In this section, we will discuss the importance of culture in tandem with PCR, highlighting the vast library of genera and species of yeast and bacteria that culture can identify. For example, clinically applicable susceptibility testing requires cultured isolates of live bacteria and yeast.

Find more modules by scanning the QR code...

Practitioners enrolled in this course get the GI360 for £149*

NEWS BITES

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

FSA moves forward with Novel Foods applications for CBD with two safety approvals



Two CBD brands have taken a step forward in the Novel Foods authorisation process after the Food Standards Agency (FSA) issued its first positive safety assessments.

Pureis and Cannaray have both been issued with a Positive Safety Assessment by the FSA as part of the Novel Foods approval process for an acceptable daily intake (ADI) of 10mg a day. It's the first time a CBD product has been granted such an opinion, which means it now moves to the next stage of approval.

To support the FSA and Food Standards Scotland (FSS) in their evaluations of the application, the Advisory Committee on Novel Foods and Processes (ACNFP) was asked to review the dossier and supplementary information provided by the applicants. The FSA and FSS concluded based on the advice of the ACNFP, that the applicant had provided

sufficient information to assure the novel food was safe under the proposed conditions of use. The anticipated intake levels and the proposed use in foods and food supplements was not considered to be nutritionally disadvantageous.

In both the assessments, the FSA and FSS said it had undertaken the assessment and "concluded that the novel food is safe under the proposed conditions of use and does not pose a safety risk to human health. The anticipated intake levels and the proposed use was not considered to be nutritionally disadvantageous".

In a blog on its website, Pureis, which is owned by Chanelle McCoy Health, said the development is an equally positive sign for the wider industry as it marks a watershed moment for CBD gaining legitimacy to be sold as a bona fide food supplement.

"Where consumers can take the most reassurance however is that both now, and in

the future, only brands who undertake the most rigorous Safety Clinical Studies will gain this FSA Positive Safety Assessment," the blog said.

It went on to say that the opinion from the FSA Scientific Committee indicates that Pureis Ultra Pure CBD has successfully fulfilled the criteria necessary to progress to the final stage of the Novel Food Licensing process. Pureis Ultra Pure CBD is lab-made, meaning it is created from a formula using natural extracts of citrus fruit, rather than being made from the cannabis plant.

Also commenting on the development was Cannaray, with a statement on its Instagram page stating: "This is a huge deal in the CBD world – only brands meeting the highest product standards will pass the assessment. So we're thrilled to have made history today as we continue to our mission to bring you gold standard CBD."

Brain health tour announced by Food for the Brain Foundation



The charity, Food for the Brain Foundation, has announced a new brain health tour in partnership with Viridian Nutrition.

The not-for-profit organisation, founded by Patrick Holford (pictured), is working with Viridian in a new partnership that will involve a series of awareness raising initiatives to highlight how diet and healthy habits can play a positive role in supporting brain and cognitive function.

In May, an Upgrade Your Brain UK tour led by Patrick and supported by Viridian will be held in conjunction with health stores across the country. Each seminar will see Patrick share advice on how to approach mental health from childhood to the older generation, in particular, cognitive impairment, and crucially why prevention is better than cure. A social media drive will also educate consumers on the key nutrients and lifestyle tips for brain health.

Patrick advised: "There is a mental health breakdown with rising levels of ADHD, autism, depression and dementia. We know that less sugar and carbs, more omega 3, B vitamins and vitamin D and also more antioxidant rich foods massively reduces risk, as does an active physical, social and intellectual lifestyle. These are all relatively easy to change. The challenge, and the reason why we welcome working with Viridian through health food stores, is to motivate people of all ages to make diet and lifestyle changes at any age to protect their brain health both now and in the future."

Aimee Benbow, Nutrition Director at Viridian, added: "Both Viridian and Food for the Brain share the same synergy and principles in educating people because it's important to enable them to make informed decisions about their own health. We are delighted to be working with Food for the Brain on this education tour. We believe that health stores are the right places for the Upgrade Your Brain tours as they are in the heart of communities and champion positive lifestyles to promote wellbeing."

Two decades of HFMA Scientific Advisor celebrated

The Health Food Manufacturers' Association's (HFMA) Scientific Advisor has been praised for 20 years of service.

Dr Michele Sadler has spent 20 years as Scientific Advisor at the HFMA, with the organisation extending its congratulations and thanks for her extensive efforts and dedication to the role.

Martin Last, HFMA Director General, commented: "Michele has been and continues to be a great asset to our work at the HFMA, bringing guidance and understanding of the scientific issues that we face in this industry. Her contribution as an expert supports us across many aspects of our activity and we are extremely grateful for her dedication and hard work over the past 20 years. We look forward to continuing our relationship with Michele and benefiting from her extensive knowledge and expertise."

Dr Sadler added: "The 20 years I have been working with HFMA have been an enriching and rewarding experience, during which many changes and developments have taken



place, not least the emergence of a number of critical EU Regulations for the industry, publication of key consensus report and important committee deliberations, and of course Brexit. It has been gratifying to see HFMA go from strength to strength during this period – and long may this continue."

Pukka partnership with Eden Project



Pukka Herbs has announced it has renewed its long-standing partnership with the Eden project.

The organic herbal tea brand is continuing to work with the Eden Project, marking a continuous collaboration since 2015 as part of Pukka's commitment to the 1% for the Planet initiative. The renewed partnership symbolises their shared mission to foster a deeper connection between people, nature, and the planet, with the ultimate goal of creating a happier and healthier world.

Since the partnership began, the Eden Project has welcomed more than six million visitors, most of whom will have experienced Pukka during their visit. Integral to the visitor experience, the Eden Project conducts daily tea-tasting sessions at the Herbal Tea House as part of its free guided tours. Additionally, visitors to the Tea Pod can discover the stories of herbs and spices that feature in Pukka's tea blends, with many of these growing in the

Rainforest Biome.

As an integral part of the continued partnership, Pukka Herbs will retain its position as the Official Herbal Tea Sponsor of the Eden Sessions presented by Volvo, 2024. Set against the backdrop of the Eden Project, this year's world-class live music series kicking off in June will feature performances from acclaimed artists including Fatboy Slim, Crowded House, Rick Astley, The National, Paolo Nutini, Suede and Manic Street Preachers, Tom Grennan and JLS.

Laure de Chaisemartin, Pukka's UK Marketing Lead, commented: "We are delighted to renew our partnership with the Eden Project, which is a real beacon of environmental stewardship and innovation. Together, we aspire to inspire millions of individuals to deepen their connections with nature, empowering them to make conscious choices for themselves and our planet."

Rita Broe, Managing Director at Eden Sessions, added: "Pukka and Eden share a passion for inspiring people to take positive action for the planet, and our jointly-developed on-site exhibits really bring to life the stories of plants which grow in our biomes and are used in Pukka's herbal teas. Here at Eden, we are storytellers, and Pukka demonstrates 'herbal wonder' – so it's a great combination which our visitors love hearing about."

IN RESEARCH

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

Project secures €10m funding to investigate raising micronutrient levels

An EU project designed to tackle micronutrient deficiency has revealed its ambitious research agenda after securing €10m in funding.

Zero Hidden Hunger EU is a new, multi-partner European consortium led by University College Cork, which has received the funding for groundbreaking research into tackling micronutrient deficiency over the next four years. The Quadram Institute will be contributing its expertise to the project, looking in particular at bioavailable iron and zinc in current diets, and how this may change in the future.

Micronutrient deficiency, a widespread form of malnutrition, poses significant challenges to human health and development across Europe. Recognising the urgency of this public health issue, the Zero Hidden Hunger EU project is set to revolutionise our understanding and response to micronutrient deficiencies. Zero Hidden Hunger EU aims to fill this critical gap by pursuing two primary objectives:

▪ **Estimating prevalence and health costs:**

The project will generate accurate measures of micronutrient deficiency prevalence using priority biomarker and intake data from diverse European populations. By focusing on high-risk groups, marginalised communities and vulnerable populations, the project aims to uncover the true extent of the issue and its associated health costs.

▪ **Developing tailored solutions:** Armed with robust evidence, the project seeks to develop context-specific, food-focused strategies to ensure adequate micronutrient intake from sustainable sources. By leveraging existing data resources, biobanks, and targeted studies, the consortium aims to deliver tailored solutions that address the root causes of micronutrient deficiencies across Europe.

Zero Hidden Hunger EU will employ cutting-edge techniques, including high-throughput biomarker analysis and advanced



data modelling, to generate credible evidence. This evidence will empower policymakers and food system actors to implement targeted interventions and eradicate micronutrient deficiencies from Europe.

Dr Maria Traka and her team in the Food & Nutrition National Bioscience Research Infrastructure will be looking at two key micronutrients where deficiencies are already prevalent: iron and zinc. They will carry out, for the first time, an assessment of how much bioavailable iron and zinc we are currently getting from our diets. They will then use advanced modelling techniques to estimate how this may change with dietary shifts, for example, switching to more plant-based diets.

“I am delighted to be part of this project that aims to understand the extent of micronutrient deficiencies in Europe and develop innovative solutions to tackle these,” Dr Traka commented.

“Micronutrient deficiencies can unfortunately go unnoticed, despite posing significant health

risks. For some of these micronutrients, it is not only the amounts we are getting from our diets that matters but also whether they are bioavailable, i.e., whether they can be effectively absorbed. For example, the types of foods we are combining in our meals matter for iron and zinc bioavailability and some plant foods can also inhibit our absorption.”

Professors Mairead Kiely and Kevin Cashman, of Project Coordinator, University College Cork, expressed optimism about the project’s potential impact.

“Zero Hidden Hunger EU represents a landmark effort to confront the silent crisis of micronutrient deficiency in Europe. By leveraging innovative research methodologies and collaborative partnerships, we aim to drive meaningful change and ensure equitable access to essential nutrients across European populations,” they commented.

Research links bacteria supplementation to improving skin conditions

A new study has suggested that probiotic and prebiotic supplementation may improve atopic dermatitis and eczema.

Researchers writing in the journal, *Medicina*, explained that the role of the skin-gut axis in atopic dermatitis (AD) remains a subject of debate, limiting non-pharmacological interventions such as probiotics and prebiotics. To improve understanding of their potential as a monotherapy for stable, mild cases, they conducted a real-life, multicentre, retrospective observational study in Italy.

They administered three selected bacteria (*Bifidobacterium animalis subsp. lactis* BS01, *Lactiplantibacillus plantarum* LP14, and *Lactocaseibacillus rhamnosus* LR05) orally to patients with mild atopic dermatitis without a placebo control group, following up for 12 weeks.

Clinical assessments using the Scoring Atopic Dermatitis (SCORAD), Eczema Area and Severity Index (EASI), and Three-Item Severity (TIS) score were conducted on 144 enrolled patients. They reported that notably, both pruritus and AD-related lesions (erythema, edema/papules, excoriation) exhibited significant clinical and statistical improvement after 12 weeks of exclusive probiotic and prebiotic use.

“These preliminary results suggest a potential link between the skin-gut microbiome and support the rationale for using specific probiotics and prebiotics in mild AD, even for maintenance, to reduce flares and dysbiosis,” they said in conclusion.



Data over two decades reveals benefits of exercise programmes

New research looking at health data from the last 20 years has highlighted the benefits of exercise programmes for individuals living with long-term health conditions.

Drawing on a comprehensive overview of published evidence spanning 39 different

long-term conditions – and encompassing 990 randomised controlled trials and more than 900,000 patients – the research underscores the fundamental role of exercise in enhancing the wellbeing of individuals living with long-term health conditions.

Conducted by researchers at the University of Glasgow in collaboration with the University of Leicester, University of Birmingham, University of Exeter, University of Salford, University of York, and Trinity College Dublin, the latest study is published in *eClinicalMedicine*.

In this study, the researchers found that participation in exercise programmes leads to consistent improvements in exercise capacity as well as enhanced quality of life across a broad spectrum of 25 long-term conditions. However, there remained some areas of uncertainty, including the impact of exercise programmes on mortality and hospitalisation rates for people with long-term conditions.

Researchers argue the findings of the study indicate the need for healthcare services to adopt approaches that consider the importance of targeted exercise interventions for people who have one or more long-term health conditions.

Dr Grace Dibben, lead researcher of the study from the University of Glasgow’s MRC/CSO Social and Public Health Sciences Unit, commented: “Almost half of the global population live with at least one long-term condition, which results in substantial health and socioeconomic burden. Our findings underscore the urgent need for healthcare systems to integrate exercise interventions into the management of long-term conditions, to better address the diverse needs of individuals living with a wider range of long-term conditions.”



Call for diagnostic testing to support omega 3 intakes

A new review has suggested that increased diagnostic testing could help improve omega 3 status.

The review has been published in the *Journal of Nutrition* and was commissioned by the Global Organization for EPA and DHA Omega-3s (GOED). It explained that there is an increasing body of evidence supporting a link between low intakes of ω -3 long-chain polyunsaturated fatty acids (LCPUFA) and numerous diseases and health conditions. However, few people are achieving the levels of fish/seafood or eicosapentaenoic acid and docosahexaenoic acid intake recommended in national and international guidelines.

The review went on to explain that knowledge of a person's ω -3 LCPUFA status will benefit the interpretation of research results and could be expected to lead to an increased effort to increase intake.

"Dietary intake survey methods are often used as a surrogate for measuring ω -3 PUFA tissue status and its impact on health and functional outcomes. However, because individuals vary widely in their ability to digest and absorb ω -3 PUFA, analytical testing of biological samples is desirable to accurately evaluate ω -3 PUFA status," the review explained.



"Adipose tissue is the reference biospecimen for measuring tissue fatty acids, but less-invasive methods, such as measurements in whole blood or its components (e.g., plasma, serum, red blood cell membranes) or breast milk are often used. Numerous commercial laboratories provide fatty acid testing of blood and breast milk samples by different methods and present their results in a variety of reports, such as a full fatty acid profile, ω -3 and ω -6 fatty acid profiles, fatty acid ratios, as well as the Omega-3 Index, the Holman Omega-3 Test, OmegaScore,

and OmegaCheck, among others.

"This narrative review provides information about the different ways to measure ω -3 LCPUFA status (including both dietary assessments and selected commercially available analytical tests of blood and breast milk samples) and discusses evidence linking increased ω -3 LCPUFA intake or status to improved health, focusing on cardiovascular, neurological, pregnancy, and eye health, in support of recommendations to increase ω -3 LCPUFA intake and testing."

Vitamin D reduces menstrual pain in new review

Vitamin D supplementation may help to ease menstrual pain, according to researchers.

The new study, published in the *Nutrients* journal, reported that vitamin D reduces prostaglandin levels and inflammation, making it a promising treatment option for dysmenorrhoea. However, its effects on pain intensity in different types of dysmenorrhoea remain unclear. And so, the researchers examined whether vitamin D supplementation decreases pain intensity in patients with dysmenorrhoea.

The Cochrane Library, Embase, Google Scholar, Medline, and Scopus databases were searched and randomised controlled trials (RCTs) evaluating vitamin D supplementation effects on such patients were included. The primary and secondary outcomes were measured by the changes in pain intensity and rescue analgesic use, respectively. Pooled mean differences and rate ratios were calculated using a random-effect model; trial sequential analysis (TSA) was also performed. Overall, 11 studies involving 687 participants were included.

In analysing the results, it was found that vitamin D supplementation significantly decreased pain intensity in patients with dysmenorrhoea compared with controls and indicated substantial heterogeneity among the included studies. In subgroup analyses, vitamin D supplementation reduced primary dysmenorrhoea pain but not secondary dysmenorrhoea pain.

The researchers wrote: "In conclusion, although substantial heterogeneity persists, vitamin D supplementation decreased pain intensity in patients with dysmenorrhoea, especially in those with primary dysmenorrhoea."



NEW TO MARKET

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

Wellness with wholefoods



A new brand has launched a range of superfood drink powders focused on whole ingredients.

Wellnoa says it is going against the grain of traditional supplement-fuelled, powdered drink brands by specialising in only utilising whole foods, so customers can be assured they are getting the key nutritional value without sacrificing natural ingredients. They are organic and vegan, and clearly labelled with the ingredient details and benefits. Transparency is extremely important to the brand and no artificial colours, flavours, or additives are used.

The range includes The Green Drink – Immunity Booster, an organic supercharger containing wheat grass powder, barley grass powder, lucuma powder, pineapple powder, spirulina powder, chlorella powder, kale powder, matcha powder, lemon juice extract, chaga mushroom powder. There is also The Pink Drink – Glow From Within made with ground flaxseeds, rice protein powder, hibiscus powder, lucuma powder, beetroot powder, açai powder and turmeric powder. This premium formula is full of antioxidants and designed to promote skin and hormonal health as it helps clear complexion, boost collagen production, balance your hormones and help you destress.

And then there is The Ultimate Topping – Brainy Breakfast as an organic topping for your breakfast and made with dried white mulberries, chopped apricots, walnut halves, pumpkin seeds, chia seeds, unbleached whole almonds, dried goji berries, dried cranberries, and lion's mane powder.

Cordyceps launch for Solaray

Cordyceps Mushroom Complex is the latest addition to the range at Solaray.

Matured on whole oats under optimal conditions in a state-of-the-art facility, Solaray's Cordyceps Mushroom Complex is produced from the highest quality mushrooms.

Martin Watson, Country Manager for Solaray, commented: "Cordyceps is a really versatile fungus and an exciting new addition to our product range. The mushrooms used in our specialist formula are carefully cultivated in a highly controlled environment to ensure the best quality product. Taken with appropriate guidance from a health professional, this product has the potential to support immune health, respiratory health and boost energy, allowing people to live brighter, healthier lives."

Cordyceps Mushroom Complex is lab verified, gluten free, vegan, and sold in 100 per cent PCR bottles.



BodyBio builds range



A new supplement targeted at supporting those with stress and anxiety has been launched by BodyBio.

BodyBio Calm is a botanical blend designed to manage the body's stress response, helping to create a general feeling of calm and focus, whilst optimising cellular health.

The new supplement includes the neurotransmitter, glycine, along with taurine, rhodiola, and phosphatidylserine and manganese.

As a family business, BodyBio manufactures all its products in-house and rigorously tests the quality of all their supplements. It also carefully sources the highest quality raw materials for their products, which are never oxidized or heat-treated.

Vegan launch for Viridian with focus on collagen

Viridian Nutrition has announced the development of a new vegan supplement designed to match type 1 human collagen.

Collagen Pro Factors has been formulated with the precise ratio of amino acids to match type 1 human collagen and is described as the ideal collagen builder. Made from non-animal sources, the formulation also includes vitamin C to support the normal production of collagen in the human body.



The advanced plant-based supplement, the newest addition to the Ultimate Beauty range, also features clinically studied beneficial bacteria for added support.

Collagen Pro Factors is available as a 150g powder and can be easily added to water and cold drinks.

Like all Viridian supplements in the range, Collagen Pro Factors contains 100 per cent active ingredients and no artificial fillers or nasties.



DR TOM O'BRYAN LIVE IN LONDON

We are delighted to announce that Dr Tom O'Bryan will be returning to present at the IHCAN Summit this summer.

Dr Tom O'Bryan, a *Nutrition I-Mag* and *IHCAN* magazine fan-favourite, will be returning to the stage in London this summer at the IHCAN Summit.

Taking place on Saturday, June 22, this flagship event marks a significant date in the integrative health calendar.

His talk, 'Demystifying Lipopolysaccharides (LPS) – Targeting microbial LPS to quench the fire within', will explain how LPS is making waves as a catalyst for a myriad of systemic health concerns, ranging from gut and joint health, to autoimmunity, brain fog, Alzheimer's disease, fatigue and sepsis.

Dr O'Bryan will explain where LPS comes from, what drives its production and disbursement and how the body responds to systemic LPS infiltration.

You will glean insights into:

- Environments where LPS flourishes.
- Health concerns in which LPS plays a role.
- What happens when LPS accumulates over a lifetime.
- The relationship between microbiome health and LPS.
- Protocols for quenching the systemic fire initiated by LPS.

Dr Leo Pruijboom confirmed

Dr O'Bryan is joined by Dr Leo Pruijboom, PhD, a pioneer in clinical psychoneuroimmunology, who earned a standing ovation for his talk at last November's IHCAN Summit.

He will be joined by GP and author of *The Clot Thickens*, Dr Malcolm Kendrick, who'll present on the theme, 'How blood clots cause



heart disease – the 170-year-old 'brand new' hypothesis'.

Completing the line-up is Beverley Sarstedt, a specialist in helping women with persistent and recurrent urinary tract infections. Beverley will be presenting on UTIs, biofilms and effective testing – a comprehensive protocol developed by American nurse practitioner, Ruth Kriz, presented here for the first time in the UK.

Get your tickets

Tickets for the summit are limited and selling quickly, with 60 per cent already sold at the time of going to press. Secure your ticket at ihcansummit.co.uk or telephone 01279 810080.

Generous discounts are available for members of professional associations and students.



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Liver health PROTOCOLS

Performing hundreds of essential functions, ensuring liver health is critical for overall wellness. Our nutrition experts explain the best approaches to take in clinic when supporting clients.

We cannot escape the fact that many elements of the modern lifestyle – both dietary and lifestyle – can place a huge burden on the liver. Unhealthy patterns that have become the norm for many people, such as processed foods, regular alcohol consumption, and excess amounts of refined sugar all place huge pressure on the liver.

When you then consider people eating such foods can already be nutrient depleted, and that we are exposed to a whole range of toxins that need to be processed by the liver, this places huge pressure on an already stressed organ.

When it comes to the liver, what does the data look like in terms of the most common issues we are seeing?

Keri Briggs, Senior Nutrition and Technical Advice Specialist at Lamberts Healthcare, advised: “Liver disease is one of the fastest rising causes of death in the UK, with rates quadrupling since 1970. There are several liver conditions which are both preventable and if treated early enough, can also be reversed. One is linked to the excessive consumption of alcohol, and statistics show that one in five people consume more than the recommended units of alcohol per week. Almost two million people in the UK are estimated to be drinking at a level which could cause liver disease.”

Catherine Gorman, Nutritionist at Good Health Naturally, highlighted the scale of the problem: “Chronic liver disease has become a major global health problem. The most common condition is non-alcoholic fatty liver disease (NAFLD). It is estimated that 25 per cent of the world’s population is affected by this disorder. Other prevalent liver-related illnesses include alcohol-related liver disease and chronic hepatitis B and C infections.

“In the UK, there has been a 400 per cent increase in deaths due to liver disease since 1970, and it has risen by almost five times in people under 65 years old. It is now the third most common cause of premature death in the UK. Modern lifestyles certainly seem to be having a negative impact on liver health. Processed foods, sugars and

unhealthy fats place an undue burden on the liver. Excessive alcohol consumption is another culprit, with poor diet exacerbating its effects and speeding up liver damage.

“Liver disease has also been closely linked with inequality and deprivation; British Liver Trust figures show premature deaths from liver disease are four times higher in the most deprived areas compared to the most affluent. This trend is echoed around the world.”

Alice Bradshaw, Head of Nutrition Education and Information at Terranova, went on: “Our modern way of living would appear to be impacting our collective liver health in a negative way. Commonly seen liver related issues include damage from alcohol misuse, NAFLD related to obesity and metabolic syndrome, viral hepatitis and autoimmune diseases affecting the liver. A significant majority of liver health issues are within our control. It’s thought that most liver deaths are related to lifestyle and environment, with alcohol consumption being the most common contributing factor. Poor food choices and a generally unhealthy lifestyle will also compromise liver health.”

Max Lambert PhD has been carrying out leading clinical research into the effects plant derived bioactive compounds on human health since 2013. He advised: “The most common liver disease in the world is NAFLD. NAFLD encompasses two distinct conditions: NAFLD, which includes steatosis (abnormal retention of fat in the liver) (≥ 5 per cent fat content by weight of the liver) alone and/or presenting with inflammation; and non-alcoholic steatohepatitis (NASH) that includes varying degrees of scarring fibrosis (scarring)/cirrhosis (severe scarring) and/or includes severe cases with concurrent liver cancer. NAFLD has a prevalence of 25 per cent and NASH has 4.2 per cent in the general population in Europe (1).

“Alcohol related liver disease (ARLD) is liver damage caused by excessive alcohol consumption and involves a broad spectrum of diseases such as liver steatosis, steatohepatitis, hepatitis, and cirrhosis. It affects around 5.4 per cent of the population in Europe (2).”



Liver science

Let's look in greater detail at this organ and its functions.

Helen Edwards, Nutritional Therapist at New Roots Herbal, explained: "The liver is one of the most important vital organs, responsible for filtering and detoxifying toxins as well as pathogens. It's difficult to surgically fix or replace a deteriorating liver. However, the liver has a unique capacity to regenerate after damage. A liver can regrow to a normal size even after up to 90 per cent of it has been removed!"

"The most harmful things for liver health include environmental toxins, infections, alcohol, stress and poor diet. This can burden our detox pathways and lead to immune dysfunction or endocrine issues. There are many foods, nutrients and activities we can incorporate into our daily life to optimise liver detoxification pathways. Through the right nutrition and lifestyle factors, we can support and improve our methylation, which basically switches genes on and off and repairs DNA. Methylation plays an important role in liver detoxification processes to help eliminate toxins."

Gorman went on: "If you consider how busy the liver is it should

come as no surprise poor liver function can have a massive impact on health. It deals with thousands of toxins every day, including airborne pollutants, caffeine, alcohol, food additives and preservatives, pesticides and chemicals from household and personal care products. It produces bile to aid digestion and help the body break down fats. Vitamins A, D, E, K and B12 are stored in the liver until the body needs them. It also manages the supply and storage of glycogen releasing glucose into the bloodstream as and when the body needs it."

Eleanor Faulkner, Nutrition Advisor at Viridian Nutrition, added: "The most common forms of liver disease, NAFLD and ALD, aren't genetic, and can be controlled and avoided through lifestyle and diet changes. There are, however, certain liver diseases caused by genetic defects. Two of the most common include Hemochromatosis and Alpha 1 Antitrypsin Deficiency. Hemochromatosis is a condition in which the body stores too much iron, which can harm the liver. Alpha 1 Antitrypsin deficiency is a rare condition that is caused by a lack of a specific enzyme. This leads to a build-up of this substance which can harm the liver."



The causes of liver overload

The liver is required in so many body functions, given modern diets, the liver is likely to be overloaded, leading to a range of issues.

Bradshaw advised: "The liver is involved in filtering toxins from the body's blood supply, maintaining healthy blood sugar levels, regulating blood clotting, along with numerous other vital functions. As such, it's possible to overwhelm the liver's ability to perform optimally by consuming refined, processed foods, excessive sugar and alcohol. Cigarettes and recreational and prescription drugs also place extra burden on the liver. Additionally, chemicals found in the environment and personal care products need to be filtered through the liver to protect our health."

Edwards added: "I see many people struggling with hormonal issues, due to the overburden of toxins the liver has to deal with. On average, a person is exposed to more than 700,000 toxic chemicals a day! From perfumes, cosmetics, cleaning products, pesticides on foods, cookware and utensils, our water supply, plastic bottles and storage containers, stain- and water-resistant furniture, it's not surprising to see studies where babies are born with hundreds of chemicals in their bodies. Many of these chemicals are sources of xenoestrogens, which mimic the effect of oestrogen and are endocrine disruptors that have oestrogen-like effects on the body, which can affect thyroid health, fertility, men's hormonal health and more.

"I also see many digestive issues related to poor bile flow and bile acid malabsorption resulting in poor absorption of fat-soluble vitamins and essential fatty acids. Poor bile flow can also cause an overgrowth of less beneficial bacteria and other pathogens. Bile helps remove toxins and neutralises acidic chime from the stomach in the small intestine, without which you can be susceptible to inflammatory bowel conditions. With our changing diet around more grains and processed foods, increased stress, medications and lack of exercise and good sleep puts a greater burden on our liver and bile flow."

And Gorman commented: "While most people know too much alcohol can harm the liver, many are completely unaware an unhealthy diet and lifestyle can be damaging to it too. NAFLD can affect people who drink little or no alcohol, and it is becoming a serious problem. As the name implies, it means there is too much fat in the liver cells. In the early stages, it doesn't usually cause harm but can lead to serious damage such as cirrhosis. Many 'lifestyle' diseases can make people more prone to NAFLD, in particular, obesity and type 2 diabetes, especially when fat is concentrated in the abdomen. Other conditions which have been associated with fatty liver disease include high cholesterol, metabolic syndrome, polycystic ovary syndrome, sleep apnoea, and an underactive thyroid.

"It is now estimated almost two-thirds of UK adults are overweight or obese. Worryingly, obesity levels among primary school children between 2019-20 and 2020-21 rose by 4.5 per cent, the highest annual increase since records began in 2007. Excess alcohol consumption is also putting many at risk of liver disease. The British Liver Trust estimate around one in five people in the UK drink over the Chief Medical Officer's low-risk guideline limit of 14 units per week. Figures show in England alone, 1.9 million people have reported drinking at harmful levels that could cause liver disease. The liver can only metabolise a limited amount of alcohol at a time. Overloading the system can

lead to a backlog, causing toxins to circulate throughout the body."

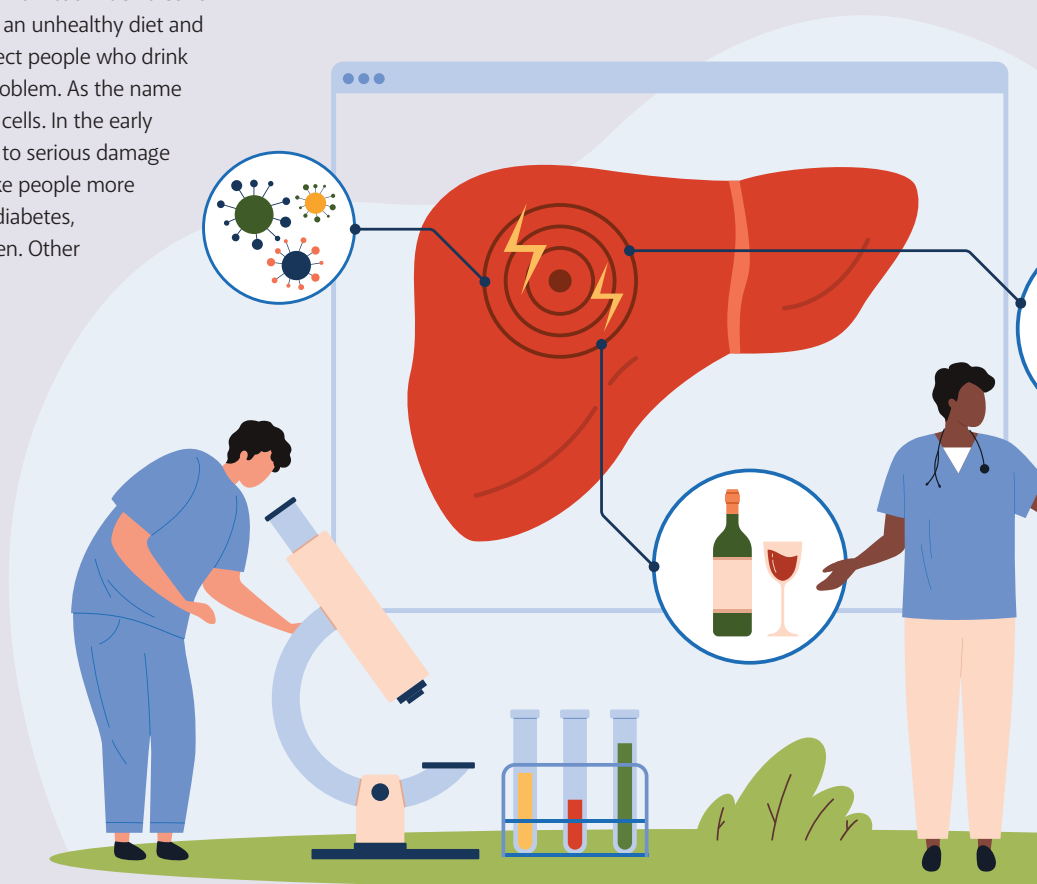
We should also consider the effect of stress.

"The liver controls the rate of energy fuel distribution to the body. When the hypothalamic-pituitary-adrenal (HPA) axis is low, the liver can store glucose as glycogen and direct the lipids for storage, controlling the levels of cholesterol in the blood. Conversely, during a stress response cortisol causes the liver to release glucose," Edwards explained. "However, the continual increased cortisol production in response to chronic stress can disrupt our natural feedback loop, and cause changes in the HPA axis, promoting an inflammatory response and a cascade liver issues, including poor bile flow, which affects our ability to transport and eliminate toxic metabolites."

It's also important to note the signs a person may exhibit if the liver isn't functioning well.

Briggs advised: "Poor liver function often has few symptoms initially, and many people are unaware of an issue until the condition advances or blood tests are carried out. As the liver is involved in so many biological processes, including digestion and the maintenance of glucose levels, early symptoms can include digestive issues, low energy and fatigue and pain in the upper right abdomen, where the liver is situated. If further damage occurs to the liver, then signs such as itching skin, jaundice and cognitive issues can also occur. NAFLD is also associated with an increased risk of other conditions including heart disease, diabetes and hypertension."

Gorman went on: "Signs which could indicate the liver is not operating optimally include low energy, excess weight gain, brain fog, poor immunity, digestive discomfort and skin problems. Constant tiredness could mean the liver is not functioning efficiently due to toxin overload or impaired glucose storage. If the liver continues to struggle, it can cause intensely itchy skin, hair loss, oedema, dark urine, pale-coloured stools or very dark/black tarry stools and yellowing of the whites of the eyes and the skin."



Focus on NAFLD

One of the biggest issues we see these days is Non-Alcoholic Fatty Liver Disease, commonly referred to as NAFLD.

Briggs commented: "This is the most common liver disease in the world and is estimated to affect 30 per cent of adults worldwide and one in five in the UK. In the earliest stages, NAFLD simply causes a build-up of fat in the liver but in some cases, this can progress to a more serious form of the disease, called NASH (non-alcoholic steatohepatitis). The accumulation of fatty acids in the liver has been hypothesised to cause lipotoxicity, which is associated with changes in the lipid composition within the cells, cellular and mitochondrial dysfunction, damage to liver cells and increases in inflammation. It is these changes which can lead to the development of NASH and scarring to liver tissue. However, both NAFLD and NASH can be reversed if they are caught early enough.

"NAFLD is an increasing concern as many of the risk factors for its development are on the increase. High dietary intake of fat and sugar can be of particular importance as foods high in these compounds are directly linked to NAFLD. They are also associated with an increased risk of developing insulin resistance. If insulin becomes less effective, this can lead to the breakdown of fats, adipose tissue and triglycerides and the formation of more fatty acids, which can accumulate in the liver. Decreased insulin sensitivity can also increase the synthesis of triglycerides, leading to further accumulation of fats within the liver.

"There are other underlying health concerns besides insulin resistance and type 2 diabetes linked to NAFLD and its progression to NASH. High cholesterol and triglycerides, either from an increase in synthesis, high dietary intake or dysfunction of the pathways which eliminate cholesterol can increase cholesterol build-up in the liver. This increases inflammation and escalates the replacement of healthy cells with thickened and scarred tissue which cannot function in the same fashion. High blood pressure is also linked to NAFLD, but the mechanism is unclear as NAFLD increases hypertension but conversely hypertension is also a risk factor for the development of liver issues. These conditions – insulin resistance, hypertension and high cholesterol – combine in metabolic syndrome."

Edwards added: "It is estimated that one in five people in the UK have NAFLD, which is more common among 40-50-plus years of age, as metabolism slows. It is only diagnosed when there is a high number of cholesterol-based stones blocking the bile ducts of the liver, often picked up by an ultrasound. If left untreated, it can increase the risk of cirrhosis and liver cancer. These stones build up over a long time and are caused by a combination of factors such as poor diet, a high toxic load, low physical activity, poor bile production and flow, overweight/obesity, insulin resistance, diabetes, high blood cholesterol, and even certain medications such as nonsteroidal anti-inflammatory drugs and corticosteroids.

"In contrast, it is estimated that alcohol-related fatty liver disease develops in 90 per cent of people who drink more than 40g of alcohol (or four units) per day. That's roughly the equivalent of two medium (175ml) glasses of wine, or less than two pints of regular strength beer. Even drinking a large amount of alcohol, even for just a few days, can lead to a build-up of fat/cholesterol stones in the liver. According to the British Liver Trust, nine out of 10 cases of liver disease could be prevented."



Understanding the health effects

Clearly, being such an important organ, if it is not functioning optimally and its health is being neglected, this is going to impact wellness.

Gorman explained: "If the liver is struggling, toxins can build up and cause inflammation. If toxins cannot be excreted properly, the body will try to expel them via the skin, causing issues like acne or rashes. Itchy skin can be a sign the liver is under par. If bile production becomes compromised due to poor liver function, the body will not be able to metabolise fats effectively, slowing down digestion and causing issues such as bloating and wind.

"The liver is responsible for regulating hormones and excreting any excesses from the body, so if it is not functioning optimally, it can result in hormonal imbalance, mood swings, irregular periods and hot flushes. If conditions like alcohol-related liver disease or NAFLD progress, they can lead to inflammation and damage. Cirrhosis is the result of long-term, continuous damage to the liver and may be due to many different causes. The damage leads to scarring, known as fibrosis. Irregular bumps replace the smooth liver tissue and the liver becomes harder. Together, the scarring and the nodules are called cirrhosis."

Edwards went on: "With most health issues, I believe we need to look at the function of the liver; the liver is involved in more than 500 vital functions. Many functions help support metabolism and detoxification, whilst others are related to filtration of the blood, digestion and bile production, protein synthesis, and the storage of vitamins and minerals. It is not surprising that over time, these intricate processes can be disrupted, resulting in imbalances and liver disorders. Long-term health issues related to poor liver function include bile acid malabsorption, often mistaken by the medical profession as IBS, and fat malabsorption (deficiencies in fatty acids, and vitamins A, E, D and K), which can result in a wide array of health problems related to poor vision, oxidative stress, chronic fatigue, cardiovascular disease, immune dysfunction, hormonal imbalances."

Faulkner continued: "Malnutrition can be present in those with poor liver function due to impaired absorption of nutrients from food. There is a decreased level of lipid absorption and reduced albumin production. In the liver, vitamins from fats, proteins and other food sources are activated and stored. Vitamin A and D deficiencies can be present in those with liver diseases due to the role the liver has in producing the active form of both vitamins; a diseased liver state makes it harder for them to be synthesized."

NT protocol

If you are a Nutritional Therapist supporting a client's liver health, there are various elements to consider – testing being one of them.

Edwards advised: "In assessing liver health, most laboratories examine diagnostic markers such as ALT, AST, GGT, ALP, LDH (Lactate Dehydrogenase), and Bilirubin Total (Direct and Indirect) as markers of stress and inflammation within standard reference ranges. However, I often think looking at these markers in isolation is harder to address the root cause. I like to use more comprehensive testing which provide analysis of these liver markers but also offer insights into preventive measures against liver disease before symptoms manifest. These tests analyse patterns of markers and their interplay across all body systems, utilising optimal reference ranges. They incorporate additional markers such as iron, ferritin, cholesterol, triglycerides, protein, albumin, globulin, phosphorus, and calcium, among others, to offer a comprehensive evaluation of overall health and identify potential health risks early on."

Gorman added: "Blood tests can measure levels of liver enzymes like alanine transaminase, aspartate aminotransferase, alkaline phosphatases or gamma-glutamyl transferase. Irregularities may indicate possible damage or inflammation in the liver cells or biliary issues. Scans using high-frequency sound waves can identify fat levels in the liver and signs of liver scarring. Other tests include environmental pollutant profiles,

which may be helpful to assess possible toxic burden on the liver.”

Briggs went on: “Diagnosis of NAFLD can occur in the early stages and this often comes about as a result of routine blood tests for other conditions. Liver function tests can include looking for markers such as alanine transaminase (ALT), aspartate transaminase (AST) and alkaline phosphatase (ALP). These are enzymes and raised levels indicate liver damage, causing them to be released into the blood stream from injured cells. Normally, these would need to be conducted by the GP, and if there are symptoms along with the previously mentioned risk factors, this should be considered.”

Then we come to dietary recommendations to consider.

Gorman suggested: “The first thing to recommend is removing as many processed foods as possible to help reduce the stress on the liver, especially ready meals, starchy and sugary products like breads, pastas and cakes, which can cause fat to accumulate in the liver. Diets rich in ‘healthy’ plant-based foods are associated with lower risks of NAFLD and liver fat content. In particular, it is important to include sulphur-rich foods such as cruciferous vegetables, broccoli, cabbage, cauliflower, and kale, plus onions and garlic as they aid detoxification pathways. B vitamins found in leafy greens, eggs, sunflower seeds and legumes are also essential nutrients for detoxification and can help protect the liver from the damaging effects of alcohol.

“Omega 3 fatty acids, found in oily fish like salmon, mackerel, and sardines, can help reduce liver fat levels and inflammation. Monounsaturated fats, found in avocados, nuts, and olive oil, also support liver health. Increased fibre intake is associated with a lower risk of fatty liver disease. It helps promote regular bowel movements, ensuring swift elimination of toxins and preventing them from being reabsorbed into the bloodstream. Incorporating sources of both soluble fibre like oats and apples and insoluble fibres like whole grains and vegetables is essential.

“Surprisingly, a couple of coffees a day may have a protective effect on the liver. A 10-year longitudinal study from the UK Biobank published in 2021 found coffee may be protective against chronic liver disease. The study followed nearly half a million people for a decade and found that coffee drinkers had significantly lower rates of liver disease. Interestingly the type of coffee did not seem to make a difference whether it was decaffeinated, instant or ground coffee.”

Bradshaw also recommended: “Nutrient-rich foods such as vegetables, fruits, nuts and seeds provide antioxidants and other phytonutrients that work well in a cleanse-focused diet. Green foods are rich in chlorophyll and the cruciferous vegetables (such as broccoli, Brussels sprouts and watercress) also contain fibre and sulphur compounds that facilitate the removal of toxins from the body. Amino acids also support the liver’s role in detoxification, thus protein is crucial for detoxification. Organic eggs, meat and fish along with plant-based foods such as pulses and seeds are good sources of protein.”

Briggs continued: “Weight loss, especially from around the waist if necessary, is strongly advised as obesity and central and visceral fat distribution are associated with the development of this condition. Getting related conditions such as insulin resistance, hypertension and hypercholesterolaemia under better control is also advisable.

“A Mediterranean style diet is probably one of the most relevant, as it focuses on polyphenol, potassium and magnesium-rich fruits and vegetables, foods such as nuts and seeds, which contain both omega 3 and 6 fatty acids, olive oil and lean meats and oily fish, such as herring, mackerel, salmon and sardines, which are also rich in omega 3 fats.

Processed foods are discouraged, and the emphasis is on consumption of fresh, unprocessed or minimally processed foods which are naturally much lower in sugar, salt and trans and hydrogenated fats. The Mediterranean diet has been shown to reduce LDL and triglycerides and improve LDL:HDL ratio whilst leaving HDL levels unchanged.

“The Mediterranean diet is effective at controlling metabolic syndrome, which is closely associated with NAFLD and studies have also shown it to be of direct benefit for NAFLD, mainly due to the low level of fats and sugars, the increased intake of polyphenols and antioxidants, omega 3 fatty acids, and fibre, and the effects on obesity and weight loss. Those who adhered most closely to the Mediterranean diet had better liver function test results and were less likely to have NAFLD.”

Sophie Barrett, Medical Herbalist and Mycotherapy Advisor at Hifas da Terra, added: “Liver supportive foods include a plant-based diet rich in vegetables and fibre to support healthy detoxification in general, not forgetting to include mushrooms in the mix alongside bitter vegetables, cruciferous vegetables, garlic, onions, green tea, flax and chia seeds, plenty of water, and culinary herbs and spices, especially turmeric. Make sure you are cooking mushrooms, having them in soups, or broths is best.”

And Faulkner also advised: “The diet should be high in protein, fibre, healthy fats, antioxidants, and anti-inflammatory foods such as lean meat and fresh vegetables, which help regulate blood glucose levels and

support antioxidant status, bowel and liver function. Healthy fats such as foods with high omega 3 should be kept in the diet, especially those found in walnuts and oily fish like salmon. Fat should not account for more than 25-40 per cent of the diet in those with patients with liver disease. It is recommended to have medium chain triglycerides (MCT) which is found in coconut oil and cow’s milk.

“Try to eat potassium-rich foods; the human body needs the recommended 4,700mg of potassium per day. When your food is potassium-rich, it helps cleanse the liver, lowers systolic blood pressure and cholesterol, and supports a healthy cardiovascular system. Foods like sweet potato, tomato sauces, spinach, beans and bananas are high in potassium. Make sure the gut microbiome is diverse with friendly gut bacteria. When it isn’t optimal, inflammation can arise, which promotes

fat accumulation in the liver and makes the gut wall leaky, which makes the toxins and by-products of food digestion travel up to the liver, and the liver’s response is to accumulate more fat. More fibre can help to feed good bacteria in the gut, especially prebiotic resistant starch found in beans, wholegrains and potatoes, which are not digested by digestive juices and enzymes.”

Dr Lambert also pointed out: “It is clear that modern living as characterised by excess calorie intake, improper nutrition or malnutrition, high consumption of UPFs, lack of physical activity, alcohol consumption and drug use increases exposure to risk factors related to the development of liver diseases. This is supported by epidemiological data, for example, in the UK, the mortality rate related to liver disease were four times higher in 2018 compared to 1970. In light of this, the European Society for Clinical Nutrition and Metabolism has developed a comprehensive guideline for proper nutrition to prevent and treat liver disease, which is briefly summarised below:

- Plant-focused diets, rich in fruits and vegetables, nuts, with low-fat and non-fat dairy, lean meats, fish, and poultry, mostly whole grains, and heart healthy fats.
- Limit excess fructose consumption and avoid food and beverages with added fructose.
- Poly- and mono- unsaturated fatty acids and omega 3-rich foods, should replace saturated fats.

“The Mediterranean diet is effective at controlling metabolic syndrome, which is closely associated with NAFLD and studies have also shown it to be of direct benefit for NAFLD...”



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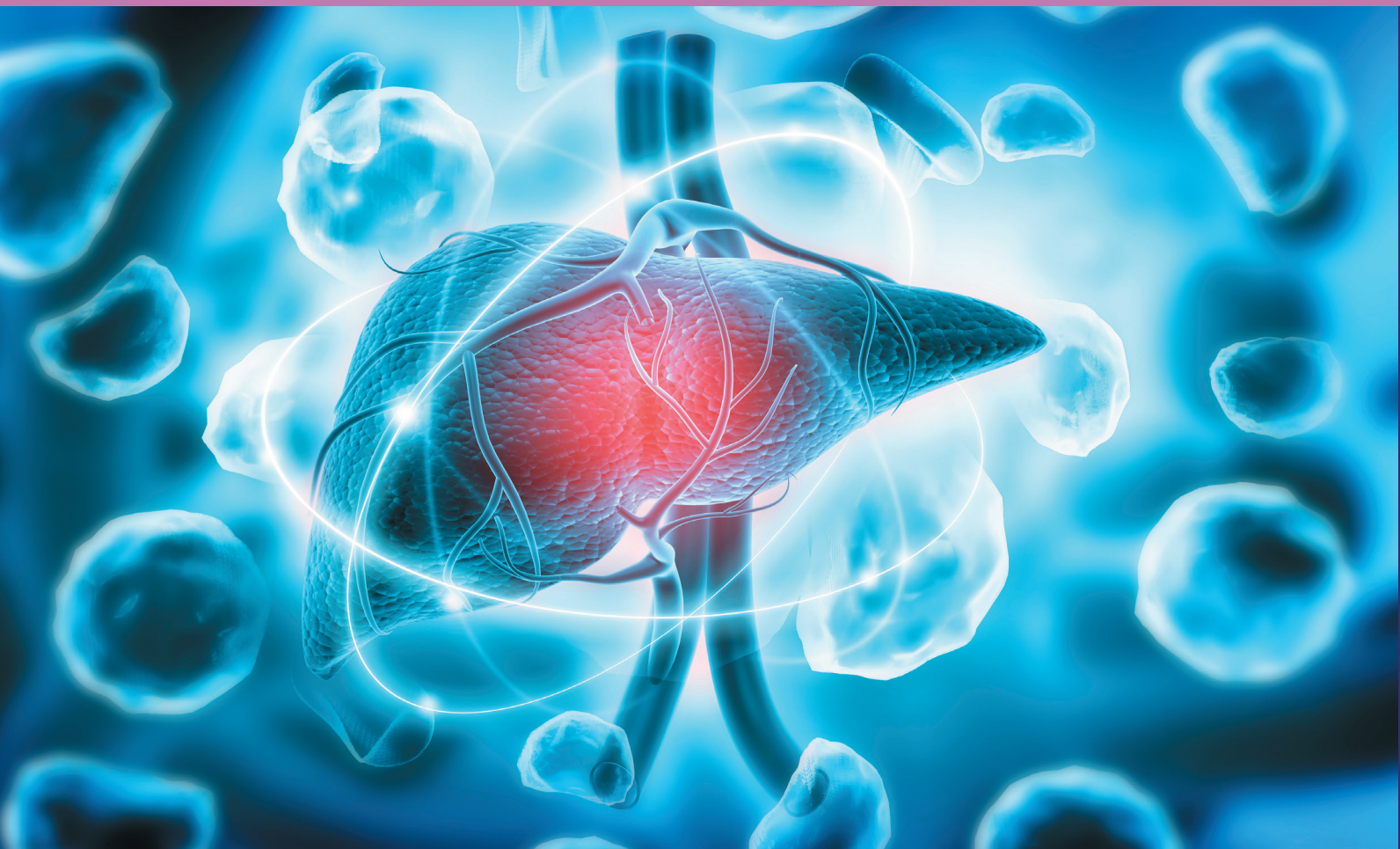
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- Replace UPFs, commercial bakery goods, and sweets with unprocessed foods high in fibre, including whole grains, vegetables, fruits, legumes, nuts, and seeds.
- Avoid excess alcohol consumption and smoking.
- Exercise regularly.”

And Edwards continued: “Hydration is a simple strategy that is often undervalued. Drinking plenty of filtered water throughout the day and adding lemon, lime, or apple cider vinegar can help to support bile duct function and bile stone elimination. Maintaining daily bowel motility with a fibre-rich diet, anti-inflammatory foods, fermented foods, and probiotics can help our digestion and keep our intestine healthy. With a low fibre diet, which can result in constipation, toxins can get recirculated rather than eliminated, which puts extra burden on our liver.

“Research is showing that incorporating various intermittent fasting strategies such as 14-16 hour overnight fasting, dinner to dinner fasting and 24-48 hour fasting may lead to improvements in liver function, reducing oxidative stress, inflammation, and liver fat accumulation. Regular exercise can stimulate fat mobilisation and facilitate toxin release through sweating and improved circulation. Both aerobic and resistance exercise in human studies were demonstrated to reduce liver fat, and improve insulin resistance and blood lipids, regardless of weight loss, although aerobic exercises may be more effective.”

Liver supplement support

Certain nutrients are crucial to ensure liver function, in a range of ways.

Gorman advised: “Glutathione or its precursor, N-acetyl-cysteine, are both good choices for supporting liver health. The liver relies on glutathione for effective toxin elimination. It is comprised of three amino acids, glutamine, glycine, and cysteine and is known as the master antioxidant because it plays an important role in detoxification pathways protecting against free radicals and peroxides. N-acetyl-cysteine is not only a precursor to glutathione, it is also a natural detoxifier, which can help remove harmful substances, such as environmental toxins and pollutants. Oxidative stress is considered a key contributor to inflammation

and liver damage in NAFLD. It is suggested the antioxidant properties of NAC may help mitigate this. It may also improve insulin sensitivity and lipid metabolism, which are also associated with the progression of NAFLD.

“Antioxidants like astaxanthin, coenzyme Q10 and L-carnitine may all have the potential to improve liver health by reducing inflammation and lowering oxidative stress, which is often associated with liver conditions like NAFLD. It has been shown astaxanthin may help reduce the severity of the fatty build-up and alleviate inflammation. A clinical study showed supplementation with CoQ10 resulted in improvements in markers for fatty liver disease. It may also help improve the lipid pattern typically associated with NAFLD. Studies have also shown L-carnitine can help reduce the amount of fat in the liver and improve its functioning.”

And Briggs recommended: “There are associations between fatty liver disease and nutrient deficiencies, and these include minerals such as zinc and copper, as well as vitamins A, niacin, B12, C, D and E. Equally, supplementation with zinc has been shown to improve glycaemic markers as well as lipids in the blood and there is also evidence to show that vitamin D deficiency is associated with an increase in severity of fatty liver.

“Supplementation may be useful for liver function and one of the main nutrients required for normal liver function is choline. This is an essential nutrient, related to the B vitamins and many of its functions are interrelated with folate and homocysteine. It is required as a constituent of cell membranes and mitochondria and is a vital part of the methylation cycles, which are essential for many biological processes in the body, including gene expression, hormone, neurotransmitter and amino acid expression, detoxification and growth and development. Studies have shown that humans consuming a diet low in choline develop fatty liver and damage to liver cells, via the accumulation of triglycerides in the liver.”

Edwards added: “A sluggish liver or gallbladder when bile acids remain in the liver for too long (also known as cholestasis) and the flow into the intestine from the gallbladder and liver is reduced, can result in malabsorption of fatty acids and fat-soluble vitamins A, D, E, and K. A congested liver can impair vitamin and mineral storage, in particular, vitamins A, B12, D, E, and K, copper, and iron. Bitter herbs are especially

good for the liver and the body's detoxification process. They can also benefit digestion, gallbladder, hormones, and more. However, to guarantee a specific therapeutic benefit associated with a herb, it is important to use extracts that show the active compound in the herb, such as the percentage silymarin in milk thistle or curcuminoids in turmeric.

"Some of my favourite liver strengthening and protecting ingredients includes milk thistle, which supports production of healthy new liver cells, the creation of bile, the synthesis and proper use of cholesterol and the elimination of toxins (heavy metals, chemicals and pollution). Artichoke containing cinarine and scolymoside have been proven to stimulate bile secretion. Cinarine has been shown to be effective at lowering cholesterol and triglycerides, and it also exerts a regenerative action on liver cells. Turmeric contains the volatile oil, curcumin, which has shown similar liver protection to that of milk thistle, due to its powerful antioxidant activity. Curcumin has anti-inflammatory and choleric effects, increasing total bile acid production by 100 per cent."

Dr Lambert continued: "In cases where liver function is impaired, supplementation with micronutrients may be necessary due to nutrient deficiency, some of the most common prescribed are vitamin A, thiamine (vitamin B1), niacin (vitamin B3), pyridoxine (vitamin B6), cyanocobalamin (vitamin B12), zinc, magnesium, folate, ascorbic acid (vitamin C) and vitamin K. As inflammation and oxidation play a key role in the development of liver disease, nutraceutical and pre-/probiotic formulations are garnering interest in its treatment and/or prevention. Many bioactive compounds from plants retain antioxidant, anti-inflammatory, hypolipidemic and hypoglycaemic properties which may benefit liver disease. For example, dandelion has been shown in numerous in vivo studies to exert hepatoprotective effects of acute liver damage induced in animals by different chemicals.

"Numerous research papers have shown a diverse array of bioactive compounds, fats, proteins, dietary fibres, pro-/prebiotics and vitamins in dandelion to contribute to improvement of NAFLD. These studies have revealed potential mechanisms including inhibition or activation enzymes regulating lipid metabolism, regulation of fat transport, potential prebiotic effects, regulation of inflammation and modulation of oxidation (6)."

And Faulkner recommended: "Black Seed extract, *Nigella sativa*, can improve levels of inflammatory biomarkers in patients with NAFLD. Some

other beneficial supplements for the liver include, curcumin, grapeseed extract, and astragalus."

Barrett highlighted the power of mushrooms.

"It has been shown that maitake extract increases the clearance of heavy metals such as mercury in vivo and in vitro by about 56 per cent. It increases the elimination of mercury from kidneys and liver to more than 2,3-dimercapto-1-propanesulfonic acid (DMPS) without adverse effects. A decrease in blood mercury levels has been observed in both acute and chronic toxicity more rapidly compared to the control group in animals. In the acute case, it falls halfway to the second day, something that does not occur in the control group until the seventh day.

"Maitake has been shown to possess antioxidant activity of superoxide free radicals, hydroxyl, lipid peroxidation, and chelating properties of ferric ions. It has also demonstrated its ability to increase levels of antioxidant enzymes such as glutathione (GSH), catalase (CAT), superoxide dismutase (SOD) at the liver and brain level, reinforcing its free radical neutralising effect.

"*Agaricus blazei* has demonstrated antioxidant capacity in several cell and animal studies. Its fundamental action is based on its capacity to neutralise hydroxyl radicals and increase antioxidant enzymes such as glutathione peroxidase (GSH-Px), catalase, and superoxide dismutase. Additionally, it is worth highlighting its hepatoprotective effect against toxin-induced damage from substances such as carbon tetrachloride or cadmium.

"Several studies have shown *Polyporus spp.* has a diuretic capacity by regulating aquaporins, fundamentally increasing excretion of sodium and chlorine ions. The dose with the greatest effect on excretion was 20mg/kg. Additionally, it has been shown to have antioxidant activity against DPPH, hydroxyl and superoxide radicals. Another study comparing the cultures of *P. ostreatus*, *L. edodes*, and *A. bisporus* amongst other fungi showed that the fungi that possessed the greatest antioxidant capacity in fresh crops was *A. bisporus* and shiitake. Another comparative study that included polysaccharides from eight species of fungi among which were *Lentinula edodes*, *Ganoderma lucidum*, *P. ostreatus* and *Hericium erinaceus*, observed that those with the greatest free radical neutralising capacity were shiitake and hericium. The extract of *C. sinensis* has been shown to have antioxidant capacity against hydrogen peroxide and to neutralise other hydroxyl, superoxide and DPPH free radicals. It has also been found that it has iron-reducing and chelating capacity."

Cut the toxins

Let's also be aware of the need to cut our toxic load where possible.

Edwards explained: "Some manmade toxins are endocrine-disrupting chemicals (EDCs), such as bisphenols, parabens, benzophenones, and phthalates. Our exposure to high levels of bisphenol A (known as BPA) is a big one, you'll find it in processed, packaged food containers, tins for soups, coconut milk, tuna and tomatoes, as well as soft and alcoholic drink cans. It can be found in plastic packaging, such as polycarbonate water bottles, cling-film, takeaway coffee cups and other food containers.

"The toxic effects of BPA are now well documented in medical literature. Research shows this endocrine-disrupting chemical causes widespread harm throughout our bodies and is linked to vitamin D deficiency, infertility, breast and prostate cancer, and

even obesity and diabetes. BPA is associated with elevated liver markers including AST, ALP, TBIL, and inversely with ALB in adults. What's even worse is when the food stored in these cheap containers at extreme temperatures i.e. hot or frozen, which is often used by takeaway restaurants, it leaches higher concentrations of BPA into the food or drink. The continued use of the same containers or water bottle at even normal temperatures is just as harmful.

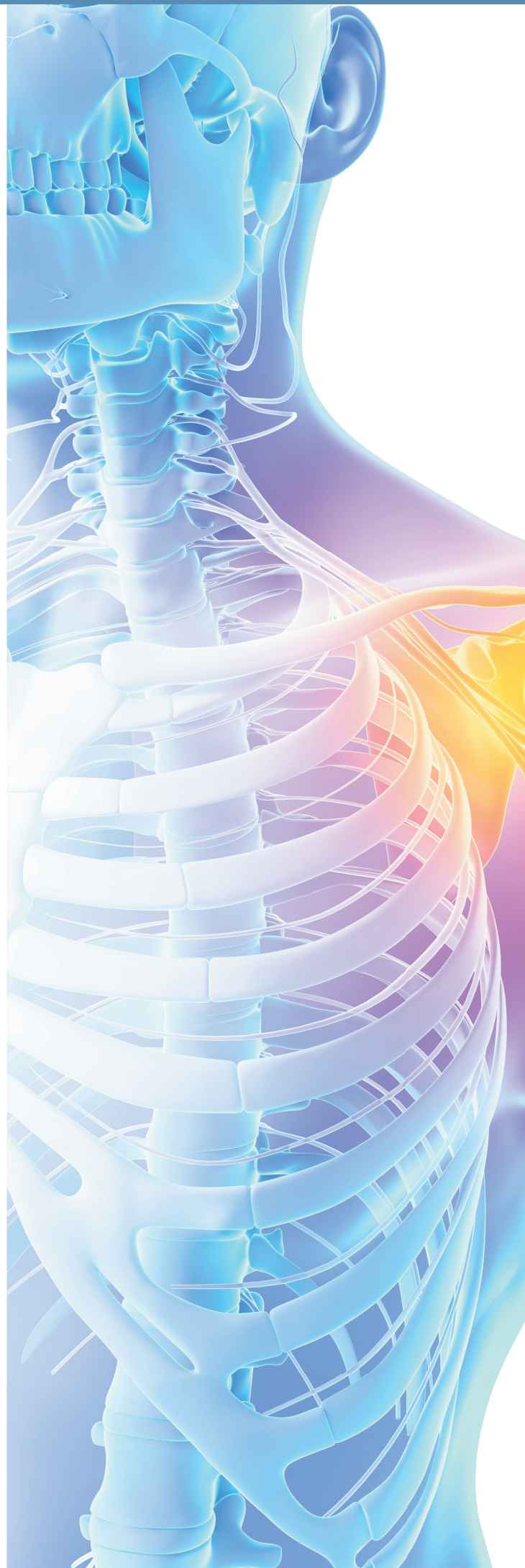
"Manufacturers are using bisphenol S (BPS) and other chemicals, which recent studies are proving are just as bad (if not worse) than BPA. When evaluating the safety levels of BPA in 800 new studies in 2023, EU officials ruled BPA to be 20,000 times too high. In response, earlier this year, the European Commission published draft regulation to ban bisphenol A and other bisphenols in food contact materials, within a 18-36-month transition period. However, as the UK no longer follow EU guides, it means the safe

level of BPA in plastic containers in the UK could still be at dangerous levels, despite the research.

"We can limit risk by buying, using and storing food and drinks in glass, ceramic, stainless steel containers and bottles. And if you need to use plastic, ensure it is BPA free and not damaged, cracked or scratched and don't be tempted to add to the dishwasher. Covering food with baking paper rather than cling film is a safer option and check the recycling codes on the bottom of plastic containers. Avoid 3, 6 and 7 for food use. Number 3, polyvinyl chloride (PVC) contains phthalates, another hormone-disrupting chemical. Number 6 (Styrofoam and Polystyrene) has been designated a possible carcinogen by US authorities and number 7 covers a variety of plastics, including polycarbonates, which may contain BPA."

Structuring a **JOINT AND BONE** protocol

Many conditions and factors come into play when assessing musculoskeletal health, meaning a multi-faceted approach is often needed. Here, our nutrition experts offer their insights into designing an effective protocol for our modern world.



The data shows more people than ever are experiencing pain conditions in the joints, with numbers suffering with arthritic problems alone hiking to an estimated 10m people in the UK.

While we know that there is a genetic element to certain joint issues, not to mention autoimmunity also being a factor, there is ample research to back up the fact that many modifiable factors – diet, nutrient levels and lifestyle choices – play a role in both risk of developing certain joint and bone issues, and also in the severity of symptoms if you do suffer.

Keri Briggs, Senior Nutrition and Technical Advice Specialist at Lamberts Healthcare, advised: “Osteoarthritis is a common condition that affects the joints and is characterised by stiffness, discomfort and a lack of mobility. Almost nine million people in the UK over the age of 45 have sought treatment for this painful condition, according to statistics from Arthritis UK. Osteoarthritis incidence (number of new cases) increased from 1997 to 2008, when it then started to drop again. However, the prevalence has increased steadily, and current figures suggest that 10 million people in the UK have this condition.

“NICE statistics show that two million women in the UK currently have osteoporosis and 180,000 fractures are the result of this condition each year. An increasingly ageing population have led to increases in prevalence of osteoporosis. The International Osteoporosis Foundation estimates there will be a 26.2 per cent increase in fragility fractures from 2017 to 2030. Peak bone mass is normally reached by the age of 25-30 and decreases steadily after this point, with a sharper drop after menopause for women. Therefore, the longer we live, the smaller the proportion of our lives are given over to building bone density and more time is in the bone loss phase.”

Lindsay Powers, Nutritionist at Good Health Naturally, went on: “Evidence suggests that the incidence of joint and bone issues has increased in

modern times. One contributing factor is the sedentary lifestyle that many people lead today. Many spend long hours sitting at a desk in front of a computer or in their cars, which can lead to weakened bones and joints. Changes in diet may also play a role, as a diet high in processed foods and low in nutrients can increase inflammation and subsequent bone and joint issues. Many people in the UK are low in vitamin D, essential for a healthy musculoskeletal system. Lastly, as the population ages, joint and bone issues naturally increase.”

Emily Simpson, Nutritional Expert and Senior Product Development Technologist at BetterYou, added: “A recent *Lancet* study suggested more than a billion people worldwide are projected to suffer from joint and muscle disorders by 2050. This is mainly due to the widespread increase in sedentary lifestyles and lack of physical activity. Consequently, depriving muscles and bones of the necessary movement to stay flexible and healthy weakens them, leading to joint problems. The other main factors include the rise in poor diets, which can lead to obesity, and the increase in ageing population. Inadequate intake of nutrients such as calcium, vitamin D and protein will contribute to bone density loss whilst excess weight causes joint strain, increasing the risk of osteoarthritis.”

And Helen Edwards, Nutritional Therapist and UK Consultant at New Roots, highlighted the knock-on effect to our health: “More people than ever are suffering with chronic pain conditions like osteoarthritis and rheumatoid arthritis – and it is estimated that one-half of those suffering with chronic pain have been suffering for longer than 10 years. These conditions are typically treated with nonsteroidal anti-inflammatory drugs (NSAIDs), which have side effects such as ulcers, gastrointestinal bleeding, heartburn, bloating, and gas and hyperpermeability.

“Leaky gut can lead to the development of allergies, dysbiosis in the small and large intestine, irritable bowel syndrome, among other digestive diseases. Research suggests that GI tracts with higher colonies of possible pathogens, such as *Clostridia* or *Klebsiella*, may contribute to musculoskeletal diseases. The pathogenesis is a complex process that may include several mechanisms, such as injuries, immune dysregulation, and inflammation, as well as a dysregulated microbiome.”

CONDITIONS TO NOTE

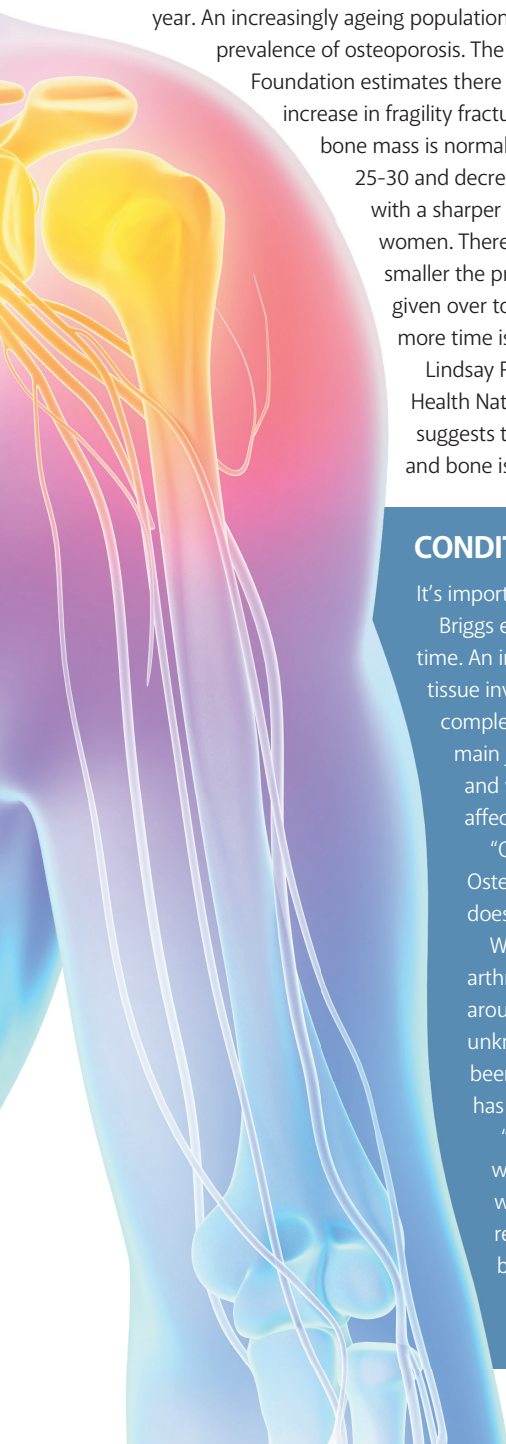
It's important to highlight the joint and bone conditions that are prevalent in society today.

Briggs explained: “Osteoarthritis occurs when cartilage which sits in the joint space becomes degraded over time. An increasingly ageing population means cases of OA are becoming more common. Whilst the primary tissue involved is cartilage, other structures including synovium, ligaments and bones. Eventually, there is a complete loss of cartilage and associated bone deformities such as spurs can also develop. The knee is the main joint affected and is involved more than twice as often as the hip and three times as often as the hands and wrists, according to Arthritis UK. It becomes more common with age and NICE figures confirm that it affects more women than men.

“Osteoporosis causes the bone to become weak which can increase the risk of fractures and breakages. Osteopenia is often the forerunner of osteoporosis and refers to lower than normal bone density which does not meet the diagnostic criteria to be classified as osteoporosis.”

Will Jordan, Nutrition Advisor at Viridian Nutrition, added: “Autoimmune diseases such as rheumatoid arthritis is a condition that causes inflammation and swelling in the joints. Rheumatoid arthritis affects around 400,000 people in the UK and women are more commonly affected. Although the exact cause is unknown, genetics are thought to play a role in the risk of developing the disease. Rheumatoid arthritis has been shown to be increasing over the past 30 years. Specifically in England, it has been reported that there has been a 40 per cent increase in rheumatoid arthritis from 2004 to 2020.

“Risk factors that could be causing the significant increase in rheumatoid arthritis include the fact that we are an ageing population. As we get older, our joints have experienced more mileage and in turn, wear and tear, which is one of the largest factors for arthritis and inflamed joints. In addition to this, reduced physical activity and increased sitting time due to modern lifestyles has led to weaker load bearing joints, making them prone to injury and therefore inflammation. Increased BMI and reduced physical activity led to increased stress on load bearing joints, which is one of the leading factors of osteoarthritis as the protective layer of cartilage is damaged more easily.”



NATURE VERSUS NURTURE

It's important to understand how much of a role certain elements out of our control – genetics, for example – play in our risk of joint and bone issues, compared to the impact our own life choices have on said risk.

Edwards advised: "When it comes to bone and joint health and conditions like osteoporosis and degenerative joint diseases like osteoarthritis, they have a strong genetic component which contributes to susceptibility. With osteoporosis, it is believed that 50-80 per cent is driven by genetics. However, bone and joint issues, as with all diseases, is strongly correlated with health and lifestyle factors such as alcohol use, prolonged use of various medications (like corticosteroids and antidepressants), gastrointestinal disorders including the health of the microbiome, mechanical injury, being overweight or obese, lack of exercise, hormonal issues, eating disorders and many others."

Alice Bradshaw, Head of Nutrition Education and Information at Terranova, also commented: "Millions of individuals in the UK live with conditions affecting their bones and/or joints, either because of degenerative disease or sports injuries or accidents. Ageing is a factor contributing to both joint and bone health issues and while there is some inevitable wear and tear that comes with advancing years, there are measures that can be taken to preserve and protect the joints and bones at any age.

"Many health experts attribute modern behaviours and environmental factors to an increase in inflammatory-related conditions. A rise in consumption of processed foods along with reduced physical activity are relatively new trends, along with virtually constant use of electronic gadgets and increasingly stressful lifestyles. A lack of sleep, food sensitivities and poor gut health are less obvious factors that may also contribute to inflammation within the body.

"Women are at further risk of developing osteoporosis if they have an early menopause (prior to the age of 45), are of Asian or European descent, or are underweight – particularly if this is due to undernutrition and over exercise. Nutrient intake and lifestyle factors can all exacerbate these risks. Dietary choices are incredibly important to support bone integrity. A diet rich in refined foods, caffeine and alcohol significantly compromises bone health, as does a sedentary lifestyle."

Briggs added: "There are numerous factors involved in the development of OA, some of which are non-modifiable, such as age, gender, genetics and ethnicity and some which can be changed such as body weight and bone metabolism. Other factors such as physical exercise and occupation can also play a role in an individual's susceptibility to developing this condition. OA has historically been considered a disease of wear and tear, caused by overloading the joints and dysfunctional biomechanics. However, it is now widely accepted that inflammation and other metabolic factors play a significant role to play in the development and progression of the condition.

"Increased BMI and being overweight or obese is strongly associated with OA and many studies, including the Framingham study, have demonstrated this link. Increased fat mass of as little as 1kg can cause increases in cartilage defects, which are then more likely to develop into OA. Those who are overweight also tend to have a quicker progression of the condition and more severe symptoms."

When it comes to bone health, Briggs continued: "A sedentary lifestyle has a large impact on the long-term health of both the joints and the bones. Exercise, particularly weight bearing exercise, is well established as supporting bone density. The pulling forces that muscles and tendons exert on the bones and the stress of impact all cause very slight, but normal deformations in the bones, which triggers the action of osteoclasts and osteoblasts to make new bone tissue. This can be useful for the formation of peak bone mass in younger people and for the ongoing maintenance of bone density during ageing. Evidence even suggests that as weak bone deforms more than strong bone, and the response to exercise is therefore greater, regular physical exercise may even reverse bone loss.

"There also seems to be an association between sarcopenia (age-related muscle loss) and osteoporosis, which is now being called osteosarcopenia. This makes sense as a loss in muscle mass and function means that there is less force being applied to the bones, limiting their potential for remodelling. But the combination of the two conditions also has a serious implication for long-term health and mortality as they both make falls more likely, and the risk of fractures is also increased. As both conditions are strongly linked to physical activity and exercise, a sedentary lifestyle is all the more important to avoid.

"Menopause is also known to have a significant effect on bone health, with up to 50 per cent of trabecular bone and 30 per cent of cortical bone mass being lost. The drop in oestrogen which occurs at this time is closely correlated to decreases in bone mass. It appears to reduce osteoclast formation and bone resorption and regulate bone formation, possibly via an effect on osteocyte numbers. Oestrogen deficiency is linked to an increase in the cell death of osteocytes, which maintain bone matrix and mineralisation."



UNDERSTANDING INFLAMMATION

At the core of certain joint issues, inflammation is high, bringing a range of painful symptoms. But why does it play such a role, and what advice can be offered to clients in terms of reducing it?

Simpson explained: "Inflammation is the body's immune response to an injury, infection or irritant including wounds, diseases and allergies. The immune system releases inflammatory chemicals and the resulting inflammation attacks joint tissues, which can cause joint swelling, increased joint fluid, cartilage and bone damage, and muscle loss. The thin membrane (synovium) lining the joints becomes inflamed, releasing chemicals that activate the nerves and increase fluid in the joint, causing pain and swollen joints.

"Numerous factors can exacerbate inflammation, including regularly eating certain foods which are high in trans-fat, salt or are highly processed. Additionally, these unhealthy foods can contribute to weight gain, which is a risk factor in itself for inflammation. Also, drinking excessive amounts of alcohol contributes to increased inflammation as toxins are released when it is metabolised that can cause damage to the gut and liver. Smoking cigarettes leads to nicotine activating neutrophils, a specific white blood cell, which releases molecules that increase inflammation. There are various symptoms of inflammation that you could potentially exhibit including pain, heat, swelling, redness, joint stiffness, gastrointestinal issues, skin rashes, fatigue and sleep disorders."

Powers went on: "Inflammation plays a central role in joint pain because it is part of the body's immune response to joint injury or tissue damage. When inflammation occurs in a joint, immune cells release various inflammatory mediators such as cytokines and prostaglandins. These substances cause blood vessels in the area to dilate, leading to increased blood flow and swelling. The release of inflammatory chemicals also stimulates nerve endings in the joint, sending pain signals to the brain. Inflammation can contribute to breakdown of cartilage and other joint structures, leading to pain and stiffness."

Jordan added: "Inflammation can be caused through a variety of reasons, from overuse of the joint or injury such as sprains and strains, infections, and illnesses such as Covid or flu, or by autoimmune conditions such as rheumatoid arthritis. Inflammation attacks joint tissue, which can lead to swelling, increased joint fluid, and damage to cartilage and bone. Hormones, histamine and bradykinin, are released and irritate and activate nerves in the joint, which causes pain. Inflammation is an immune response by the body as the affected area tends to be red and sometimes hot to the touch.

"Fundamentally, what we eat or don't eat can play a large factor in how our bodies will react to stimulus that can cause inflammation. Low status of specific nutrients that modulate and regulate the immune system can significantly worsen inflammation in the joints. Symptoms of inflamed joints could present as being swollen, red, and even hot to the touch. This can lead to aches and pains, reduced mobility and dexterity in joints which can make day to day life much harder and much less comfortable."

And Briggs explained: "Originally, OA was considered to develop due to an issue with one joint being overloaded or genetic alterations to cartilage fragility. However, studies starting in the 1990s found inflammatory compounds, such as cytokines and prostaglandins, released by chondrocytes and bone, may increase the production of matrix

metalloproteins (MMPs), which drive inflammation and breakdown of collagen and cartilage. Articular cartilage cannot repair itself as it has no blood vessels or nerves. Therefore, as we age, damage to joint tissues accumulates and worsens. Excess adipose tissue is also known to increase production of inflammatory cytokines, called adipokines, which can affect joint tissues."

Edwards went on: "We used to think arthritis and joint inflammation began and ended in the joints, with no other influences or connections. However, today, we see that inflammation in the gut can impact inflammation and pain in joints. Inflammation itself is an immune response and 60 per cent of our immune system resides in the gut; the GI tract should be one of the first places we look. Gut inflammation can be triggered by parasites, low-grade viruses, autoimmune disease, insufficient stomach acid production, and, most commonly of all, stress. Since the gut is the main entrance point of all nutrients into the body, when inflammation occurs in the gut, digestion and absorption of all nutrients decline and downstream effects in the rest of the body are seen sooner.

"Outside the GI tract, there is cross-reactivity reactions which can form between bacterial antigens in the person's tissue, leading to the production of autoantibodies and triggering inflammatory cascades within the synovium. When our body is experiencing inflammation, it puts the immune system into overdrive, which drastically increases the demand on the body. Therefore, many other symptoms of inflammation can include fatigue, muscle weakness, and brain fog. For an average person in decent health, these reactions can happen on an undetected level for years compared to someone with an autoimmune disease, over reactive immune system and allergies where these effects are much sooner and much stronger."

In terms of dietary elements to ease inflammation, Bradshaw advised: "An effective anti-inflammatory diet plan will prioritise foods that are anti-inflammatory in nature (while simultaneously limiting pro-inflammatory foods). The key focus is to include whole foods that are good sources of phytonutrients and healthy fats. Omega 3 fatty acids have been shown to exert a strong anti-inflammatory response and these are predominantly found in oily fish, flaxseeds, chia seeds and walnuts. Avoiding refined carbohydrates and high glycaemic index foods will support healthy blood sugar levels, which in turn modulates inflammation."

Powers added: "It is beneficial to eat a variety of fruits and vegetables, rich in antioxidants and other anti-inflammatory compounds. Aim for a variety of colours to ensure you're getting a wide range of nutrients. Green leafy vegetables, for example, are a good source of calcium and magnesium. Choose foods rich in anti-inflammatory omega 3, such as oily fish, flaxseeds, chia seeds, and walnuts. Foods rich in monounsaturated fats, like olive oil, avocados, and nuts, are also helpful. Eat whole grains like brown rice, quinoa, and oats, which are high in fibre and other nutrients that can help reduce inflammation. Lean proteins such as poultry, beans, legumes, tofu, and fish are also beneficial.

"On the other hand, some pro-inflammatory foods should be limited or avoided. Avoid processed foods that are often high in sugar, unhealthy fats, and refined carbohydrates, like white bread, pasta, cakes, cereals and pastries, all of which can contribute to inflammation. While lean protein is a healthy part of an anti-inflammatory diet, red meat or processed meats can be pro-inflammatory when consumed in large amounts."

"Several factors can raise inflammation, including poor diet, lack of exercise, chronic stress, smoking, and exposure to environmental toxins. When inflammation occurs, it can cause joint pain, stiffness, and swelling and may contribute to long-term damage if left untreated."

DIETARY RECOMMENDATIONS

We know a healthy diet helps the body keep inflammation under control, not to mention supporting other connected body systems, such as immunity and the gut. So, when it comes to designing a protocol for joint and bone health, what should the dietary component look like?

Jordan advised: "The Mediterranean diet is a very good dietary approach to support joint and bone health as it is high in nutrients and omega 3 fatty acids. This diet helps support and regulate mineralisation of the bones, regulate the immune system and combat inflammation. Vitamin K2 is linked with bone health, working in conjunction with vitamin D, which allows an adequate supply of calcium in the blood, while vitamin K improves the ability of calcium accumulation into the bones. The need to potentially supplement calcium will increase depending on the age of the individual, gender, diet, and the risk of developing osteoporosis. This can also be said for vitamin D and a lot of other nutrients."

Bradshaw added: "Diet can increase or reduce inflammation. One of the most important factors to managing inflammation is a diet that supports healthy blood sugar balance. Processed, refined carbohydrates (including sugar, grain-based products, etc) are rapidly broken down in the body into sugars, which disrupt blood sugar levels and promote excessive insulin production. Over time, this results in the release of inflammatory cytokines, which contribute to chronic inflammation seen in severe health disorders.

"Poor quality foods also disrupt the gut microbiome, which ultimately promotes a pro-inflammatory state within the body. Although sugars and refined carbohydrates are most implicated as pro-inflammatory, other foods to avoid include overcooked foods, hydrogenated fats and excessive omega 6 in relation to omega 3 fatty acids. Food intolerances and allergies may also exacerbate inflammation within the body; the most common food allergens include dairy, grains, gluten and soy.

"A diet to support bone health needs to be rich in fresh, whole foods and low in sugar, soft drinks, caffeine and alcohol. Some research suggests a slightly alkaline body chemistry is needed for good bone health. Refined sugar is thought to promote a more acidic body chemistry as well as deplete vital minerals, so is best limited. In the past, it was believed that excess protein was responsible for demineralisation of bone tissue. Modern research has questioned this theory as it's

been shown that inadequate protein intake, especially in the elderly population, is associated with muscle loss, but also lower bone density.¹

"One particular protein of interest for joints and bones is collagen. Collagen is the most abundant protein found in the body where its key role is to manufacture connective tissue. It is a major component of bone, skin, muscles, tendons, and cartilage, where it helps make tissues strong and resilient. Another important dietary component for bone health is a good intake of green leafy vegetables. These provide a wide range of bone-supportive nutrients, including calcium, vitamin K and boron."

And Edwards recommended: "A large systematic review of close to 200,000 participants demonstrates a seven per cent reduction in fracture risk for those following the Mediterranean diet for an average of nine years. More specifically, risk is reduced for fractures of the hip, known to be associated with increased mortality within the first year.

"While grass fed dairy and fish options provide higher amounts of calcium per gram, green vegetables, seeds and almond flour can match these when included in a daily diet. For vitamin D, fatty fish, like salmon, organ meats, eggs and portabella mushrooms are good sources. There are two different types of vitamin K. Vitamin K2 is correlated in observation studies to osteoporosis risk prevention, while vitamin K1 is known for its coagulation effects. The best sources of K2 are fermented foods such as natto, tempeh, kimchi, sauerkraut, raw dairy products from grass-fed animals, as well as egg yolk, grass fed beef, organ meats and bone marrow in bone broth. With respect to micronutrients, silica is found readily available in bananas, green beans, various vegetables and fruits, while boron is located in leafy greens, prunes, apples and beans.

"Omega 3 fatty acids can help to reduce inflammation, regulate bone tissue formation, and provide building blocks for healthy hormones. Wild caught fish, grass-fed meat, eggs, green vegetables and chia, hemp, flax and pumpkin seeds are all beneficial sources. Magnesium is a cofactor for over 600 enzymes and an activator for an additional 200 enzymes and key for vitamin D regulating pathways. Best food sources include green vegetables, seeds and grass-fed dairy. Incorporating anti-inflammatory herbs such as turmeric and ginger have shown specific benefits for joint inflammation. You can also buy these as a fermented powder which can increase the nutritional profile of the food by up to 10-fold, whilst also acting as a pre and probiotic."

She added: "Removing processed sugar and minimising simple carbohydrates would be an

important step to protect joints and bones. Sugar has been linked with increased risk for the development of reactive arthritis and can negatively influence the gut microbiota i.e., a Western diet (high fat/high sugar) has been shown to enhance counts of disease-contributing species (*Firmicutes*) and decrease counts of beneficial bacterial (*Bacteroidetes*) species."

Briggs went on: "Magnesium status is particularly relevant for bone health, and NDNS surveys have shown that around 75 per cent of women and 50 per cent of men in the UK do not consume a sufficient level of this mineral from their diets. Low magnesium has been shown to soften bone, reduce remodelling by affecting osteoblast and osteoclasts, affect PTH and increase inflammation. It is also essential for the synthesis and activation of vitamin D in the body, which in turn supports the absorption of magnesium.

"There is also interesting evidence for the role of protein in bone health and mass, with studies as early as 1985 suggesting that amino acids from protein had a bone-building effect. Many studies, looking at both sexes and ages from 18-77 have correlated protein intake with higher bone mineral density and content in various bones, including femur, neck and spine. The results seem to be particularly relevant to both adolescent and young adult women, when peak bone mass is being laid down, and for post-menopausal women when loss of BMD is at its highest.

"Protein also has a better effect on bones, when calcium intake is sufficient. Protein intake is directly associated with the maintenance of muscle mass and may be useful for preventing or slowing sarcopenia and its effects on bone density. Protein also increases the levels of a compound called insulin-like growth factor 1 IGF-1, which aids calcium absorption and improves muscle strength and mass. It also suppresses PTH, which is involved in liberating calcium from the bones."

Simpson also suggested: "It is important to maintain levels of vitamin B12 to promote bone mineral density as low levels can make your bones brittle, increasing your risk of fractures. Vitamin C is a powerful antioxidant which helps address cellular wear and tear that can set off inflammation. It also stimulates collagen and proteoglycan synthesis, which are both important parts of joint cartilage, therefore, protecting against cartilage breakdown. Hydration is often forgotten about in relation to joint health, but it helps your synovial fluid to cushion the joints and prevent cartilage friction, so motion is smooth and painless."

JOINT CRITICAL NUTRIENTS

When it comes to nutrients needed for joint health, whether through food, supplementation or both, there is quite a range to keep in mind, depending on the issue being presented.

Let's first look at nutrients to target inflammation and ease pain.

"Reducing chronic inflammation is important for reducing the symptoms and progression of OA and supporting joint health," Briggs advised. "Omega 3 fatty acid supplements which provide EPA and DHA should be considered as NDNS data shows that the intake of oily fish is low in the UK and omega 3 intakes are particularly poor when compared to other fats. Numerous studies have found a strong link between the use of fish oil and the reduction of inflammation, particularly via the production of prostaglandins. Studies suggest that fish oil can reduce symptoms such as pain associated with OA and knee function, as well as improving walking speed and reducing the need for painkillers and NSAID medications.

"Ginger has been shown to reduce inflammation by inhibiting prostaglandin production. In 2001, a randomized, double-blind, placebo-controlled trial of 247 showed that ginger reduced knee pain on standing and walking, in six weeks. Both rosehip and quercetin have been shown to reduce inflammation: rosehip by reducing C-reactive protein and quercetin by affecting IL-1 β , TNF- α , IL-6, and IL-10. A meta-analysis of three trials, including 287 patients, found that rosehip powder reduced OA pain, compared to placebo. Several studies have suggested that quercetin reduces the production of inflammatory compounds including interleukins and TNF in the body and it has been shown to be useful for OA."

Powers also suggested: "Curcumin, the active component of the turmeric root, has been extensively researched for its anti-inflammatory properties and benefits for arthritic conditions. Bromelain is an effective anti-inflammatory enzyme, which is a good choice for joint health and inflammatory health conditions. Plus, it's always helpful to include an omega 3 fatty acid supplement, such as krill oil or fish oil, as this will help to increase the production of anti-inflammatory cytokines in the body to help protect joint and bone health."

Edwards added: "Boswellia serrata, also known as Indian frankincense, is one of the pain-relieving herbs for joint inflammation, but is also intensely healing for osteoarthritis. Palmitoylethanolamide (PEA) is a fatty acid amide found throughout the body and is produced endogenously in situations of cellular injury as a protective response. It is a well-researched compound in relieving many types of chronic pain, as well as in reducing inflammation. PEA is an alternative to cannabidiol (CBD), since it acts upon the same receptor system, indirectly activating the cannabinoid receptors. Its main benefits cover a broad spectrum of types of chronic pain, making PEA a versatile option for different types of pain, from joint pain to gastric pain."

In terms of other nutrients, Jordan also suggested: "Managing inflammation first is key as this may help reduce pain. By controlling inflammation, an individual will see clear improvement in functionality of the joint and enhanced quality of life. The best way this can be done is with a range of natural anti-inflammatories. Curcumin and high-quality virgin fish oil or organic flaxseed oil, as a plant-based alternative, are your big players, and both have a tonne of research in the regulation of inflammatory markers by inhibiting certain pathways leading to inflammation.

"Another key player is black seed extract, or black seed oil, which contains a potent bioactive known as thymoquinone. Black seed has shown to reduce inflammatory markers and improve function, both topically and orally applied. White willow bark may also be useful for some individuals. Acquiring the name 'herbal aspirin', white willow has been found in studies to help relieve acute and chronic pain and reduce inflammation in the body due to the salicin content present in the bark. Boswellia extract has been used in traditional and Ayurvedic medicine to treat a variety of conditions that include inflammation, pain, and rheumatoid arthritis. The boswellics have been studied extensively and are responsible for the therapeutic effects."

And Bradshaw recommended: "Glucosamine and hyaluronic acid are

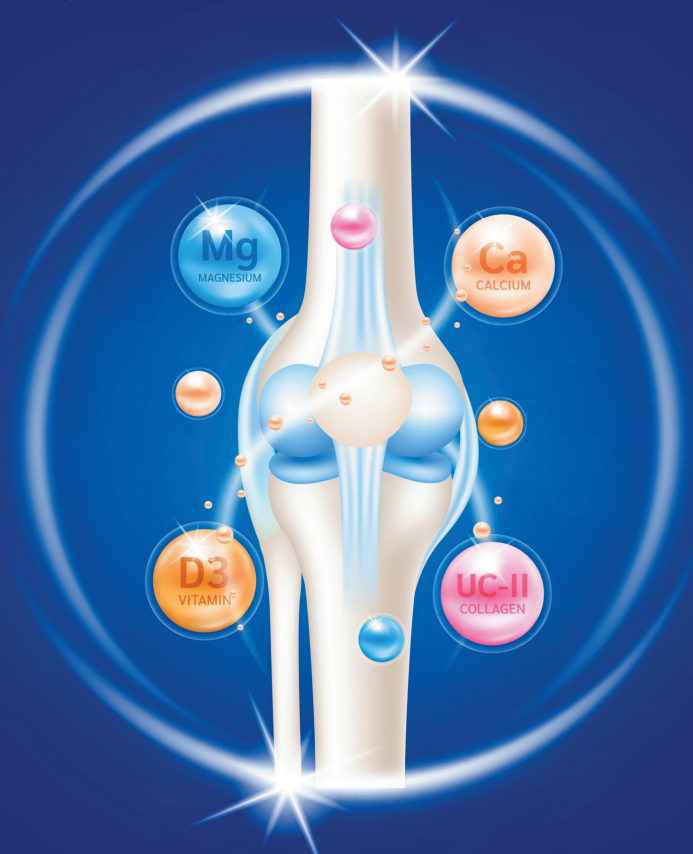
two effective supplements that are often given to support joint health. Glucosamine is required for the formation of cartilage, while hyaluronic acid gives viscosity to synovial fluid in the joint and provides a coating on cartilage cells, which is required for the cushioning effect of cartilage on the joint.

"Numerous supplements have been shown to mediate inflammatory responses. These include vitamin D3, omega 3 essential fatty acids, quercetin, boswellia, MSM, ginger, turmeric, tart cherry and many others. Proteolytic enzymes are also worth considering in a joint health protocol. These are essentially digestive enzymes that break down dietary protein, however, when taken away from food, they enter the blood stream, breaking down foreign proteins that are responsible for inflammation."

Briggs added: "There are several other compounds which can be useful for OA, such as MSM, ginger, rosehip and quercetin. MSM is a sulphur containing supplement which is used by the body to support connective tissue and it may also be useful for reducing inflammation. Studies show that MSM reduces pain and stiffness in the knees after 12 weeks. A 2017 study showed that the combination of glucosamine, chondroitin and MSM worked better than the combination of glucosamine and chondroitin and a placebo."

Edwards, meanwhile, recommended: "Internal eggshell membrane is a natural source of glucosamine, chondroitin and hyaluronic acid. Hyaluronic acid is abundant in synovial fluid, the lubricant-filled membrane surrounding joints that absorbs shock in the bones, ligaments, tendons and muscles, protecting them from friction which causes pain and restricts movement. Consumption of probiotics containing lactic-acid bacteria such as *S. thermophilus*, *L. bulgaricus*, *L. acidophilus*, or *Bifidobacterium bifidus* has been associated with reduction of reactive arthritis and musculoskeletal disorders."

Simpson added: "Magnesium is a key mineral which studies have shown reduces neuropathic pain, muscle pain, headaches and migraines. Additionally, it can help manage stress and aid sleep, which is a common issue for people with pain and inflammation. Vitamin C deficiency can contribute to musculoskeletal pain, so it is important to keep intake high to maintain levels. This is due to it being an antioxidant, which studies have shown, when administered, can provide acute and chronic pain relief. Calcium, vitamin D and vitamin K are essential to maintain bone mineral density and therefore, help to manage pain and ease inflammation."



BONE HEALTH SUPPLEMENTS

While joint related nutrients are often designed to bring down inflammation and ease pain, bone health requires a different range. In terms of supplements to potentially recommend, what do the experts advise?

Edwards suggested: "Several nutrients have been implicated for bone health, which include calcium, vitamin D, vitamin K, silica, boron and iron. When supplementing calcium, the most bioavailable form is microcrystalline hydroxyapatite, which is the main mineral component in bone itself, made up of calcium phosphate crystals and nine other minerals that intervene in bone formation. It also contains type 1 collagen, a protein that gives resistance and certain flexibility to bone matrix. Research shows that oral administration can accelerate fracture recovery and improve or prevent osteoporosis.

"Vitamin K2 helps transport calcium to bones, preventing its accumulation in arteries. K2 and D3 work synergistically, with better results in bone density when administered together than when administered separately. There is a relationship between vitamin K2 intake, bone mineral density and the risk of fracture for the elderly. This is perhaps due to the fact in the presence of a low vitamin K supply, a less carboxylated and therefore less functional protein is produced. An inverse relationship has been shown between vitamin K intake and hip fracture risk in 72,327 women."

Briggs went on: "Vitamin D should also be considered, especially during the winter months or for older people, especially those in residential care, as both age and lack of sun exposure can restrict vitamin D intake, synthesis and conversion in the body. Currently, the recommendation by the Department for Health and Social Care is 400iu (10µg) for adults in the winter, but this is judged to be insufficient by many people. A level of 40nmol/L of vitamin D is normal but a lot of experts feel that this is too low and the minimum to be considered normal should be raised to 75nmol/L; the average in the UK is 54nmol/L. Some scientists have even proposed that increasing the lower end of the normal range to 105nmol/L would decrease healthcare costs by up to 20 per cent and decrease all-cause mortality by 21 per cent.

"If protein intake from the diet is a concern, then supplementary protein can be considered in the form of whey or soya protein. Studies show that both forms of protein appear to help reduce bone loss and reduce the risk of fracture in those with osteoporosis. Soy protein appears to have an effect on IGF-1 which aids calcium absorption and improves muscle strength and mass. It also suppresses PTH, which is involved in liberating calcium from the bones."

Bradshaw continued: "Calcium is of course central to bone health as this is the mineral that bone is predominantly composed of. However, other nutrients are vital for the proper distribution and deposition of calcium into bone tissue. Vitamins D3 and K2 are fat soluble nutrients that are also crucial for bone health. Vitamin D3 promotes calcium absorption and regulates blood levels of calcium. Vitamin K2 ensures that calcium is deposited in the bone (rather than in other body tissue) by activating a protein known as osteocalcin that directs calcium to the bones and teeth. Zinc is also needed for bone homeostasis and appears to have the ability to promote bone regeneration. Manganese, boron, vitamin C and silica also play important roles in supporting the formation and stability of bone tissue."

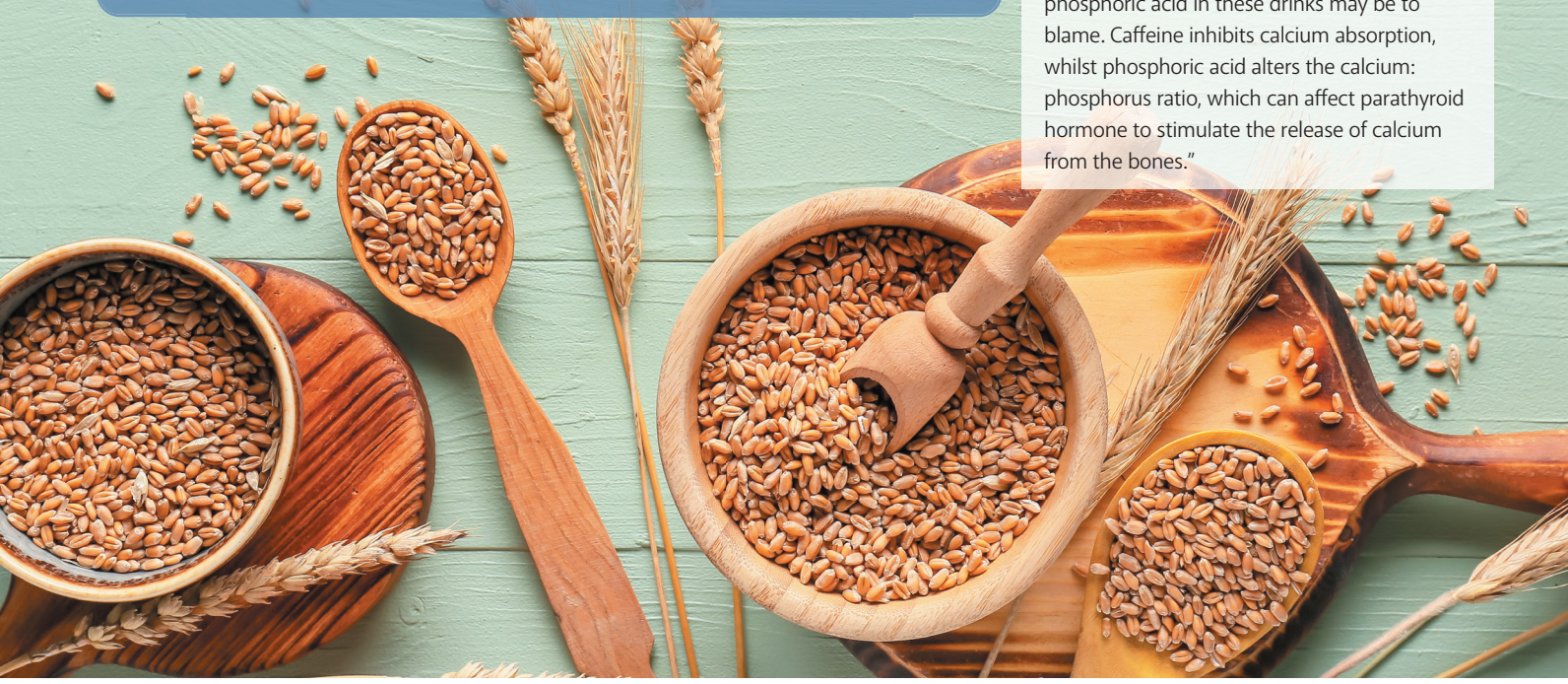
ADDITIONAL CONSIDERATIONS

Depending on symptoms presented, there may be additional steps to consider.

Edwards advised: "Identifying and removing food sensitivities, intolerances and allergies through elimination diet or testing is important as these can be inflammatory triggers for chronic pain in the musculoskeletal system. As a first step, removing dairy, especially cow's as the milk antigens (α lactalbumin, β lactoglobulin, casein) are common triggers. Based on research of those with autoimmune conditions, removing wheat and wheat gluten is a must. Eggs and soy proteins can also be problematic. A case study in the *British Medical Journal* revealed dairy elimination reduced pain, stiffness, and grip strength in a patient with reactive arthritis."

Powers continued: "Maintaining strong and healthy bones requires a combination of adequate nutrition and regular exercise. Weight-bearing exercise, such as walking, running, or weightlifting, help build and maintain bone density. It's recommended to engage in at least 30 minutes of weight-bearing exercise most days of the week. Sleep is essential for overall health, including bone health. Aim for seven to eight hours of sleep per night."

Briggs added: "Nicotine inhibits calcium absorption and other substances within cigarettes make blood more acidic and therefore are associated with bone mineral loss. Alcohol appears to reduce the production of osteoclasts, cells involved in building new bone, from marrow stem cells and may affect BMD. Carbonated drinks, especially colas, have been linked to decreased bone mineralisation. It is not clear if this is due to the replacement of calcium-rich drinks with carbonated ones, or whether there are compounds within colas which are having specific detrimental effects. Some studies have shown the caffeine and phosphoric acid in these drinks may be to blame. Caffeine inhibits calcium absorption, whilst phosphoric acid alters the calcium: phosphorus ratio, which can affect parathyroid hormone to stimulate the release of calcium from the bones."



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HEART PROTECTION

A practitioner guide to supporting heart health through
nutrition and lifestyle approaches.

Heat health has long been a concern in terms of the scale of the problem in the western world. And while we have seen some improvements in the statistics, there is still a major problem with the rate of heart ill health, not to mention the number of people suffering with key risk factors.

Keri Briggs, Senior Nutrition and Technical Advice Specialist at Lamberts, commented: "Statistics from the British Heart Foundation initially present a rather optimistic picture of the changes in cardiovascular disease. Overall, mortality from CVD dropped significantly between 1961 and 2011 from over 50 per cent of deaths to 32 per cent and deaths from all forms of CVD disease halved in the same period. However, much of this improvement is due to considerable advances in terms of diagnosis and treatment of CVD and CHD, which have improved the initial survival rate and reduced the risk of reoccurrence by managing risk factors.

"However, the number of people who have a heart attack each year has increased, despite all the public health messages regarding diet and lifestyle changes. This is partly due to an increasingly elderly population. Changes in overweight and obesity are also a significant factor; 64 per cent of the population of the UK is now considered to fall into one of these two categories, an increase of 11 per cent since 1993 and an increase in obesity from around 1.5 per cent in the 1960s to 28 per cent in 2019. Overall, the figures are still concerning as CVD (CHD and stroke) remains the leading cause of death and premature death in the UK. This is even more worrying as CVD can be influenced and managed significantly by changes in lifestyle."

Alice Bradshaw, Head of Nutrition Education and Information at Terranova, added: "According to the British Heart Foundation, since 2020, the premature death rate for cardiovascular disease has risen year-on-year and recent figures show a continued rise. There's certainly an increased risk for younger people, who also are seeing a decline in cardiovascular health, according to many sources.

"Many people are living with poor cardiovascular health. While most people associate poor heart health with heart attacks, angina and other heart-specific conditions, what often goes unrecognised is the fact that conditions such as diabetes, high cholesterol and high blood pressure are all directly linked to cardiovascular health. As well as lifestyle factors (such as lack of physical activity) and diet, hereditary factors all contribute to heart-related health conditions. A lack of sleep and poor management of stress has also been associated with poor heart health."

James Pugh, Nutritional Advisor at Viridian Nutrition, also pointed out: "According to the British Heart Foundation, since 1961, the UK's age-standardised death rate from heart and circulatory diseases has declined by three quarters. In 1961, more than half of all deaths in the UK were attributed to cardiovascular disease, whereas in 2023, this figure dropped to 27 per cent. Showing that although many deaths nowadays are still linked to heart issues, in general, it may be considered that heart health in the UK is shown to be improving compared to statistics from the 1960s. However, this could be due to a rise in other diseases such as Alzheimer's and cancer."

Heart health snapshot

So, let's put into perspective where the UK sits in terms of heart health issues.

Martina Della Vedova, Nutritional Therapist and Nutritional Advisor at NaturesPlus, advised: "British Heart Foundation in March 2024 reports that about 7.6 million people in the UK live with a heart or circulatory disease: four million men and 3.6 million women. Heart and circulatory diseases cause a quarter of all deaths in the UK. One person every three minutes dies from it. Coronary heart disease is the most common type of heart disease, the most common cause of heart attack and was the single biggest killer of both men and women worldwide in 2019. More than five million people in the UK have diabetes and many thousands remain undiagnosed.

"Around 100,000 hospital admission happen each year due to heart attack, around 1.4 million people in the UK today have survived a heart attack, and more than a million people are living with heart failure. Strokes are the biggest cause of severe disability in the UK and cause around 34,000 deaths each year. Each day, 13 babies are diagnosed with heart defects. More than 30,000 heart arrests happen out of hospital with a survival rate of less than one in 10. Numbers are showing a clear picture: heart and circulatory disease reached alarming rates. The good news is that we can do a lot about it: choosing a correct diet and lifestyle can really change drastically our risks."

Briggs continued: "There are a huge number of issues which can potentially affect the health of the heart and many circulatory issues are intrinsically linked to heart health and vice versa. Some of these conditions, such as cardiomyopathy and heart rhythm disorders, can be inherited, but many develop over time, particularly in relation to lifestyle factors as well as genetic predisposition and other diseases. The umbrella term of cardiovascular disease (CVD) encompasses any condition which affects the heart or circulation, including stroke, vascular dementia and high blood pressure. The NHS defines four categories of CVD: Coronary heart disease (CHD); strokes and transient ischaemic attack (TIAs); peripheral artery disease; aortic disease.

"CHD is the most common of the four types of CVD and accounts for over 65,000 deaths annually in the UK. CHD is defined by a narrowing of the arteries (sometimes called atherosclerosis) due to a build-up of a fatty material known as atheroma, and the pain felt from this is angina. If the artery becomes blocked by a blood clot or a piece of atheroma, this will cause a myocardial infarction (MI), commonly known as a heart attack. This category also covers heart failure, as this can often occur after a heart attack as the ability of the heart to pump effectively is compromised. There is often some hardening of the blood vessels walls (arteriosclerosis), making them less flexible and restricting blood flow."

Lindsay Powers, Nutritionist at Good Health Naturally, added: "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. While they suggest that heart and circulatory disease deaths have halved in recent years, it still accounts for a quarter of all deaths in the UK or 170,000 deaths yearly.

"Some of the most common issues seen today include coronary artery disease (CAD), hypertension (high blood pressure), and heart failure. CAD occurs when the blood vessels that supply the heart with blood become narrowed or blocked. This can lead to chest pain (angina), heart attacks, and other complications. Hypertension, on the other hand, puts extra strain on the heart and blood vessels, increasing risk of heart disease, stroke, and other health problems. Heart failure refers to the heart's inability to pump blood effectively, leading to symptoms such as shortness of breath, fatigue, and swelling in the legs. Another common heart health issue is atrial fibrillation (AF), associated with an abnormal heart rhythm (arrhythmia). This condition can also increase the risk of stroke. We're also seeing a rise in myocarditis, which is inflammation of the heart muscle.

"Compared to a generation ago, there are differences in prevalence of heart-related conditions. For example, CAD rates have decreased slightly due to improved awareness and management of risk factors such as smoking. However, conditions like hypertension and atrial fibrillation may be more prevalent due to factors such as increased stress, changes in dietary patterns, and an ageing population."

Who is at risk?

Anyone with a poor lifestyle and inadequate nutrition puts themselves at risk of heart ill health but the facts run much deeper in terms of who is most at risk.

Bradshaw advised: "There are multiple risk factors contributing to the development of heart problems. There are dietary and lifestyle habits that increase the likelihood of poor cardiovascular health and these include smoking, inactivity, a poor quality diet and excessive alcohol intake. Ageing is also a factor and as women reach menopausal age, their risk for heart disease increases. At menopause, oestrogen levels decrease, and it's known that this hormone has a protective effect on heart health.

"It's also thought that insulin resistance is more likely at this stage of life and a combination of these factors, plus possible weight gain and lack of regular exercise all increase the likelihood of poor cardiovascular health. People living with diabetes or who are significantly above an ideal weight have a higher risk of many health conditions, including heart disease and very often these conditions can be seen through generation within a family. Ethnicity is another factor with people of south Asian and Black African or African Caribbean background being more likely to be diagnosed with CVD."

Pugh continued: "Typically, heart problems occur in the older generation. This is because people over the age of 40 are more susceptible to developing cardiovascular disease. High blood pressure, diabetes and high cholesterol are all more common in those over the age of 40, which is often due to diet and inactivity. People who are overweight and obese are generally more susceptible to having an unhealthy heart. This is caused by an increase in fat build up around crucial organs such as the heart, putting it under more strain. It is also thought that men are at greater risk of developing heart disease at a younger age. Cardiovascular disease develops seven to 10 years later in women compared to men. This is thought to be due to more men smoking, drinking and having poor diets compared to women.

"Our diet is one of the main contributing factors to the health of our hearts. However, there are many other aspects of our lives that can impact our heart health, one of these being our environment and the air quality where we live. This can have a detrimental effect on our lungs and breathing, which, of course, can put more strain on our cardiovascular system."

Della Vedova went on: "Everyone can be susceptible to heart problems. We don't need to have a disease diagnosis to put our heart at risk: high blood pressure is a great example. Untreated high blood pressure can lead to many health complications at any age. High blood pressure is a symptom that can appear for many different reasons, in fact, inherited predispositions represent only a small percentage of the causes. Obesity, unhealthy diet, smoking, stress, sedentary lifestyle, poor sleep, poor kidney function, and use of certain medications are only some of the reasons why high blood pressure is such a common symptom."

Briggs, meanwhile, highlighted the effect of homocysteine.

"Homocysteine is an amino acid naturally found in the body as part of the methylation cycle which produces methionine, cysteine and SAMe," she explained. "Body levels of homocysteine are normally low due to it being an intermediate product in the processes involved in methylation but in some circumstances, homocysteine levels can be raised, and the most common reasons are linked to vitamins B6, B12 and folate.

"Gene mutations affecting methylene tetrahydrofolate reductase

(MTHFR) are relatively common, affecting up to an estimated 40 per cent of some populations and these prevent the methylation of the aforementioned B vitamins and therefore inhibit the recycling of homocysteine and allow it to build up. Deficiencies in B6, B12 and folate, conditions such as diabetes and thyroid disease and drugs including tobacco, caffeine and alcohol may all be associated with an increase in homocysteine levels. Raised homocysteine has been linked to the development of a number of degenerative conditions, including heart disease and there are many mechanisms involved. The main processes involved are endothelial cell damage, leading to constriction of the blood vessels of the heart, stiffening of the blood vessel walls and changes in blood clotting. High homocysteine may make the negative effects of other risk factors, such as smoking, high blood pressure, inflammation and dyslipidaemia, more significant."

Looking in greater detail, we must consider the effect of high blood pressure on the health of the heart in the long-term.

Powers explained: "According to Blood Pressure UK, one in three adults has high blood pressure. They estimate that 31 per cent of men and around 26 per cent of women have high blood pressure. However, many more cases are undiagnosed or not receiving treatment, so the numbers are estimated to be much higher."

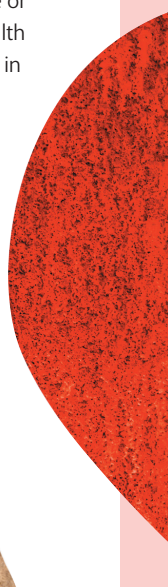
Briggs continued: "High blood pressure or hypertension is strongly linked to the health of the heart and the link was first studied in detail in the Framingham Study, which has been running since 1948. Normal blood pressure can vary depending on activity, stress and emotional state but high blood pressure is defined by The National Institute of Clinical Excellence (NICE) to be a reading of 140/90, confirmed by further readings of 135/85. Public Health England has identified one in four people in England have high blood pressure and it is a significant

contributory factor to early death and disability, only behind smoking and diet in its significance. The most worrying statistics indicate that for every 10 people with diagnosed hypertension, there are a further seven who are undiagnosed, and this could be a figure of up to 5.5 million people in England alone who have undiagnosed and therefore untreated blood pressure.

"Chronic hypertension is linked to left ventricular hypertrophy, characterised by thickening and enlargement of the left ventricle, a further increase in blood pressure and a reduction in the heart's pumping. Ultimately, this can cause dysfunction of the other chambers of the heart and lead to heart failure and is a clear marker for mortality from CHD and for morbidity overall.

"There are several risk factors for the development of hypertension and whilst some, such as gender, age, genetics and ethnicity cannot be changed, we can be aware of those who may be at a higher risk and monitor them accordingly. Risk factors which can be modified include smoking, excess salt intake, sedentary lifestyle, obesity and stress; studies confirm that reducing sodium supports the 10mm reduction in systolic pressure. When sodium intake is too high, blood pressure increases to facilitate the excretion via the kidneys to maintain extra-cellular sodium concentration and prevent toxicity."

"The most worrying statistics indicate that for every 10 people with diagnosed hypertension, there are a further seven who are undiagnosed, and this could be a figure of up to 5.5 million people in England alone."



FOCUS ON CHOLESTEROL

Another important risk factor is cholesterol and its impact on the heart.

Briggs explained: "The Framingham Study identified the link between high cholesterol and CHD in the 1960s. Around one in six people in the UK are thought to have raised cholesterol, although many remain undiagnosed and therefore untreated. It is estimated that around 7.1 per cent of deaths in the UK can be directly attributed to high cholesterol. However, to understand the effects on the health of the heart, it is important to understand the 'types' of cholesterol present in the body.

"Cholesterol is made by the liver and is essential for cell development and maintenance, the production of hormones and for the functioning and insulation of nerve cells. We also obtain cholesterol from animal-based foods such as meat, eggs and dairy produce, and it has been hypothesised that a diet high in saturated fats causes an increase in a type of cholesterol often referred to as LDL. LDL refers to a type of lipoprotein, which is a combination of cholesterol molecules and a protein carrier. LDL (low density lipoprotein) carries cholesterol to the cells of the body. However, when cholesterol levels are higher than required, it is LDL which causes the deposition of cholesterol in the blood vessels. This leads to a narrowing of the blood vessel walls and the increased chance of a blockage and therefore an MI or stroke

occurring. Oxidised LDL is considered to be particularly problematic and is strongly linked to the development of atherosclerotic issues. It is also possible for the body to develop antibodies to oxidised LDL, which can be used as a marker for progression of heart disease, particularly heart failure, and may be indicative of an immune and therefore an inflammatory element.

"There is another form of lipoprotein, called HDL (high density lipoprotein), which is often referred to as 'good' cholesterol. This lipoprotein is involved in carrying cholesterol away from the blood vessels and to the liver for removal. Whilst overall cholesterol is often a marker for the risk of CHD, many practitioners will now also consider the balance between LDL, HDL and also triglycerides in an effort to assess individual risk and determine the best form of treatment. The determination of whether cholesterol is high and requires intervention will depend on what other risk factors are present but is currently set at 5mmol/L but may be reduced to 4mmol/L if someone has other factors."

In terms of why someone has raised cholesterol, Briggs went on: "Obesity and an increased fat mass has been shown to have a significant effect on triglycerides, which can then affect cholesterol. A higher fat mass and particularly a high waist circumference, means there are more free fatty acids being processed by the liver and higher circulating triglycerides. This has been shown, along with high LDL cholesterol, to be a significant risk factor for development of arteriosclerosis. Higher fat mass is also associated with an increase in production of inflammatory compounds, which can then cause the accumulation of cholesterol and atherosclerosis. Adipokines can also reduce the clearance of triglyceride remnants from the body, allowing them to then accumulate in the blood vessels.

"Exercise is also important for triggering a phenomenon known as reverse cholesterol transport (RCT) by increasing the level of 'good' HDL in the blood. Regular physical activity has been shown to increase HDL by 1-2mg per dL, which reduces the risk of CHD by around 40 per cent. Exercise appears to allow skeletal muscle to use excess lipids in preference to glycogen and therefore reduces circulating lipids. The mechanisms are still unclear but may involve changes in enzymes such as an increase in lecithin-cholesterol acyltransferase (LCAT), which increases HDL and a reduction in cholesteryl ester transfer protein (CETP), which reduces HDL."

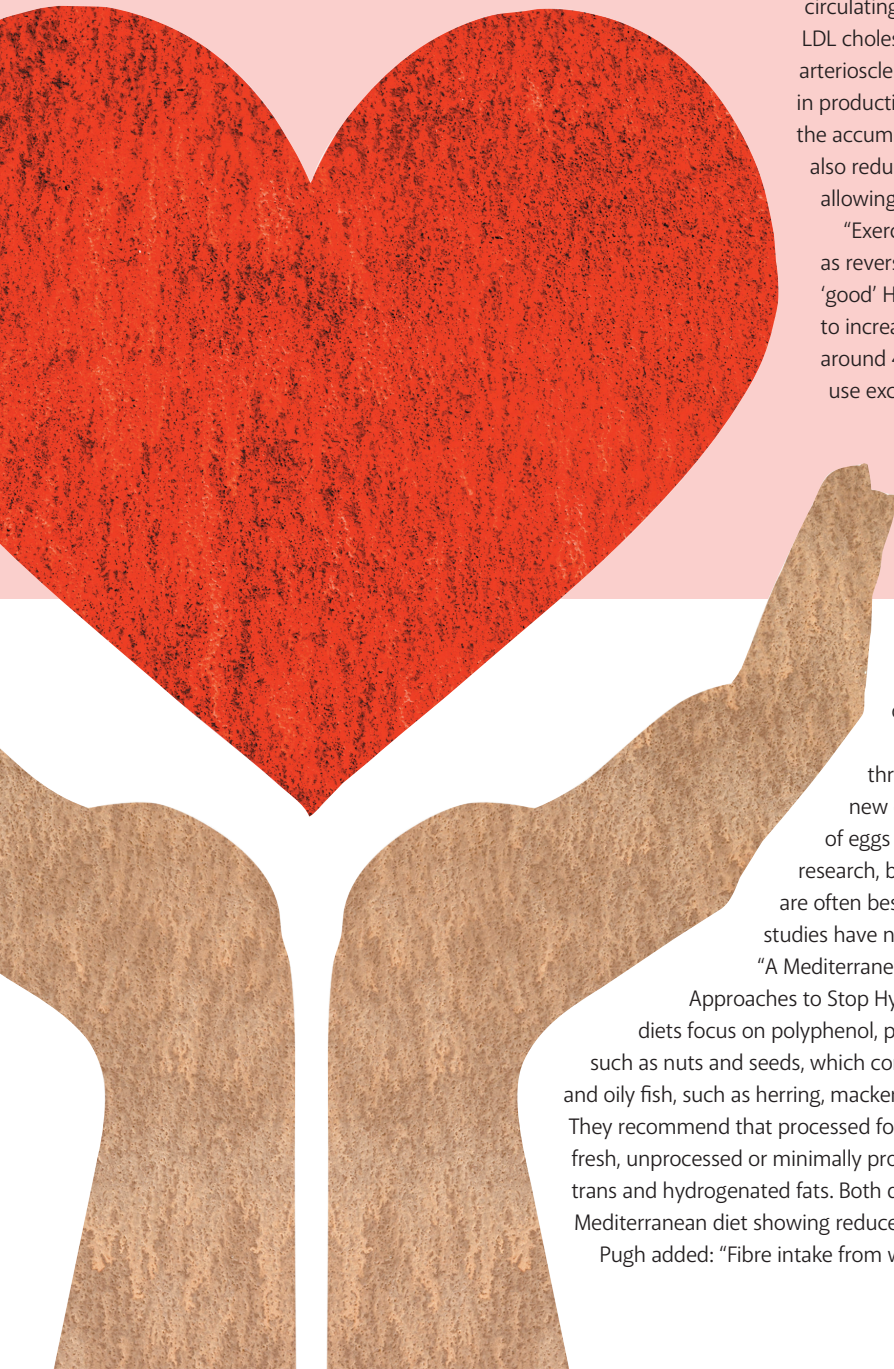
The Med way

If we look at dietary patterns that are well-researched in terms of heart benefits, the Mediterranean diet is one such approach.

Briggs advised: "There has been a plethora of dietary advice through the years, which has been ever changing and evolving as new evidence comes to light. Very low-fat diets and the omission of eggs were often recommended in the earlier days of heart disease research, but these recommendations have changed. Low fat 'diet' foods are often best avoided due to their reliance on sugar to provide taste as studies have now linked sugar to an increased risk of heart disease.

"A Mediterranean style diet, which is very similar to the DASH (Dietary Approaches to Stop Hypertension) diet, is probably one of the most relevant. These diets focus on polyphenol, potassium and magnesium-rich fruits and vegetables, foods such as nuts and seeds, which contain both omega 3 and 6 fatty acids, olive oil and lean meats and oily fish, such as herring, mackerel, salmon and sardines, which are also rich in omega 3 fats. They recommend that processed foods are avoided, and the emphasis is on the consumption of fresh, unprocessed or minimally processed foods which are naturally much lower in sugar, salt and trans and hydrogenated fats. Both diets are associated with an improvement in CVD risk, with the Mediterranean diet showing reduced instances of CHD and stroke."

Pugh added: "Fibre intake from wholegrains, vegetables and fruit has also been shown to reduce



the risk of cardiovascular disease. In addition, fibre supplementation has reduced triglycerides, LDL cholesterol levels and specific markers for assessing plaque build-up in the arteries.

“Foods rich in iron will improve haemoglobin levels within red blood cells. However, ensuring that iron levels are kept at a stable level is important to avoid adverse side effects such as elevated iron levels, as well as anaemia. Iron is found in red meats as well as leafy greens like spinach. Following a ‘heart healthy’ diet is probably considered uncommon in the UK because wholefoods tend to be healthier for the heart and as we know, 57 per cent of our diet comes from ultra-processed foods rather than wholefoods. Whereas the Mediterranean diet involves less than 20 per cent of ultra-processed foods, which has been shown to reduce the risk of heart disease due to being made up of more wholefoods such as vegetables, fish, seeds, and wholegrains.”

Della Vedova also suggested:

“We need different kind of fibre, antioxidants, noble fats, and protein to keep our blood sugar low, our microbiome happy and our liver and gut able to clear toxins efficiently. We need to be nourishing, absorbing, utilising, and clearing at the right speed. Choosing nourishing foods is the first step to make sure we are doing all we can to keep healthy.

“Keeping blood sugar under control would be the first step: avoid processed food and pre-made/packaged food as it contains sugars and preservatives, avoid sugary foods and drinks, limit simple carbohydrates. Replace these with more complex carbohydrates, plenty of colourful vegetables to diversify fibre intake, and try to make your go-to snacks real fresh food. Choosing fresh healthy fat and protein-rich foods as a snack helps massively in keeping our blood sugar under control as well as our energy going, instead of crashing and choosing to have another coffee. Healthy snacks could be hummus with veggies, olives and nuts, a boiled egg with a few spinach leaves, and Greek yogurt with some seeds.”

Nutrients for the heart

When it comes to specific nutrients needed, Powers advised: “Magnesium is a critical mineral that plays a role in heart health, yet figures show around 50 per cent of the Western population does not get enough. This is mainly due to 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. Low magnesium levels have been linked with CVD disorders such as high blood pressure, AFIB, blocked arteries and cardiac arrests. Magnesium also plays a crucial role in relaxing the blood vessels to help the blood flow more freely.

“Magnesium also works closely with vitamins K2 and D3 to support proper calcium metabolism, vital for heart health to prevent calcium deposits in the blood vessels. K2 lowers 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 possible calcification of blood vessels, contributing to atherosclerosis. A combination product containing both D3 and K2 in spray form is a good option for all ages, as it is easy to take and absorbs well compared to some tablet alternatives.”

Briggs went on: “An adequate intake of B vitamins, especially B6, B12 and folic acid, as well as minerals such as magnesium, potassium and calcium will all be useful for supporting normal homocysteine and blood pressure. In cases where MTHFR mutations may be present then methylated forms of those B vitamins, pyridoxyl-5-phosphate (P5P), methylcobalamin and methylfolate can be considered. Folic acid is of particular importance as National Diet and Nutrition Surveys have shown

worrying results, indicating folate intake has fallen by around 10 per cent in the last 20 years, especially in women and

teenage girls. B12 is of concern for older people and those following a vegetarian or vegan

diet and supplementation would be a wise choice for these groups at least.

“Omega 3 fatty acids, especially EPA and DHA found in oily fish, should also be considered to

support heart health. Again, NDNS data shows that the

intake of oily fish is low in the UK and omega 3

intakes are particularly poor when compared to other fats. A combined

intake of 250mg of EPA and DHA can contribute to normal heart function

and an intake of 3g of these two fatty acids a

day can contribute to the maintenance of normal blood

pressure. Numerous studies

have found a strong link between the use of fish oil and improvements

in CHD mortality, and these effects may be due to several mechanisms including the

reduction of inflammation and the stabilisation

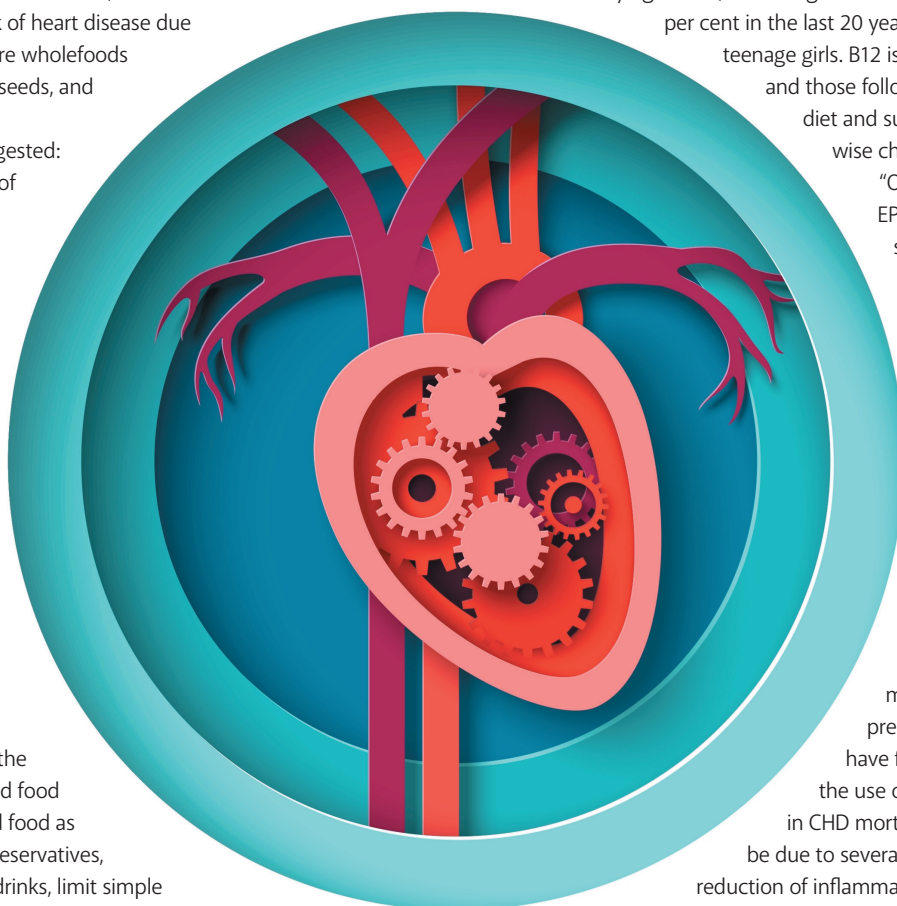
of cell membranes. Evidence suggested that a sufficient

intake can normalise triglycerides, reduce blood pressure, reduce inflammation and reduce the formation of plaques in the arteries.”

Bradshaw added: “Heart healthy fatty acids (EPA and DHA), found within fish oil and flaxseeds and omega 9 fats found in olive oil, avocados, walnuts and almonds play a significant role modulating blood fats and stabilising insulin and blood sugar levels (thereby reducing inflammation), factors that are important to the cardiovascular system. B vitamins are often associated with energy production and stress management; however, they also play a vital role in heart health. B vitamins are involved in the metabolism and conversion of homocysteine back into non-harmful substances.”

And Pugh suggested: “Nutrients such as potassium and magnesium have been shown to lower blood pressure levels and improve the function of the heart. Garlic is another option for supporting heart health through both dietary sources and supplementation. This ingredient has been shown to exert blood lipid regulating effects and promote vascular function. Cardiovascular tonics such as hawthorn berry and L-carnitine would also be beneficial for improving heart health. These have both been shown to help prevent hypertension and improve overall heart function.”

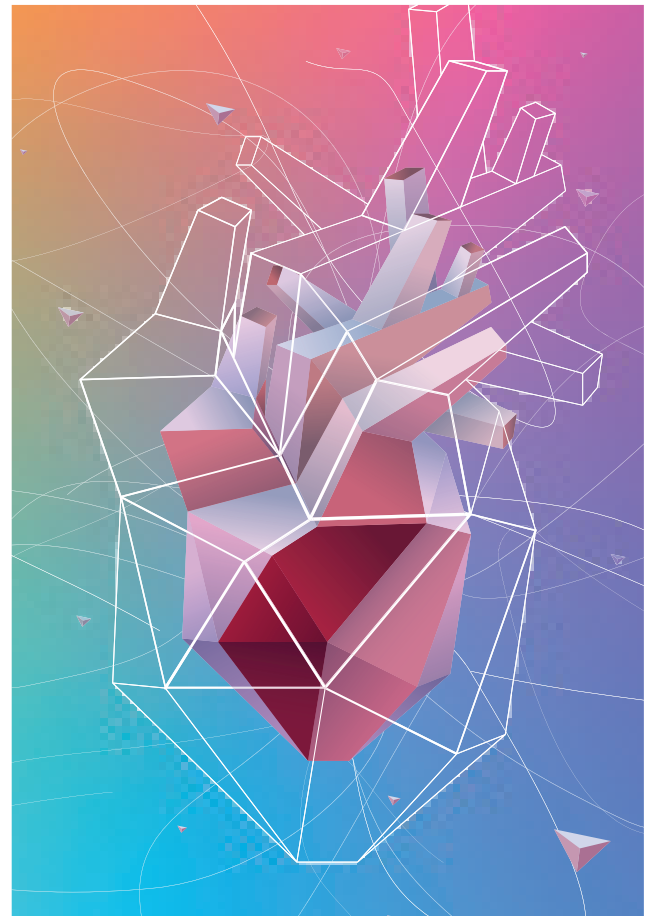
Briggs also advised: “Riboflavin (vitamin B2) and L-carnitine would be considered useful nutrients for the function of the mitochondria. Riboflavin is a key factor in the electron transport chain and is also a



co-factor in the transport of fatty acids across the mitochondrial membrane by carnitine. Like most of the other B vitamins, there is little to no storage of this nutrient in the body, so an adequate daily intake is essential. Carnitine is involved in mitochondrial function via the transport of fatty acids into the mitochondria for energy production. It is also involved in the transport of toxins out of the mitochondria and can be particularly low in diets where red meat and dairy products are avoided. Studies suggest that carnitine reduces high blood pressure, high cholesterol and triglycerides, as well as reducing ventricular issues and injury to the heart.

“Vitamin E is associated with preventing the oxidation of cholesterol, inhibiting platelet aggregation and maintaining the correct function of the heart. Various studies have shown a 47 per cent reduction in cardiac fatality or MI. Studies from the 1980s and 1990s have found a link between seasons and CVD, which has been attributed to lower levels of circulating vitamin D during the winter months. Vitamin D deficiency has been associated with blood vessel stiffness, left ventricular hypertrophy, high blood pressure and endothelial dysfunction.

“Astaxanthin is a carotenoid obtained naturally from fresh water green microalgae, *Haematococcus pluvialis*. Unlike most antioxidant nutrients which work either inside (vitamin E beta carotene) or outside (vitamin C) the cell membrane, astaxanthin straddles the membrane providing excellent protection from oxidative stress. It is also much more potent than other antioxidants due to the presence of both a keto and hydroxyl group. Studies suggest that it has a 14–65× higher antioxidant activity compared with vitamin C, vitamin E, β-carotin and pycnogenol. Astaxanthin reacts with peroxynitrite, a reactive oxygen species (ROS) which is involved in the oxidation of LDL and lipids, to make a new antioxidant compound 15-nitroastaxanthin. Astaxanthin therefore slows LDL oxidation. This carotenoid also appears to reduce vascular stiffness and increase availability of nitric oxide leading to a decrease in systolic blood pressure.”



CoQ10 and the heart

One nutrient that is hugely connected to the heart is coenzyme Q10, with expanding research confirming its importance.

Frank Brogan, Senior Nutritionist at Pharma Nord, advised: “Coenzyme Q10 is perhaps one of the most studied compounds in cardiology and supplementation can help support the heart in various prestigious trials (including Q-Symbio and together with selenium in KiSel-10). Bioavailability is crucial for Q10, so researching a formula with proven bioavailability is recommended.”

Della Vedova went on: “This important antioxidant is present in high amounts in the heart tissue, as well as in brain and reproductive tissues. It plays a crucial role

in energy making within the cells and for clearing the tissue from free radicals to keep it young and functional. CoQ10 supplements can be very helpful, especially if they combine it with cofactors.”

And Briggs advised: “CoQ10 should be considered for the overall health of the heart, due to their effects on the function of the mitochondria. These organelles are vital for the production of energy, via the electron transport chain, and the heart muscle has a particularly high requirement for energy. Mitochondria are very susceptible to oxidative stress and damage and therefore maintaining the balance of oxidation and antioxidants is of importance.

“CoQ10 supports the production of

energy and decreases as we age. CoQ10 appears to reduce inflammation and act as an antioxidant as well as having effects on the dilation of the blood vessels, via the production of nitric oxide. Numerous studies suggest that CoQ10 can reduce blood pressure and contribute to the overall health of the heart, not least by reducing left ventricular hypertrophy. CoQ10 is particularly relevant for those taking statins as these medications reduce CoQ10 production as well as having effects on fatty acid oxidation (an essential energy source in the mitochondria) and increasing oxidative stress. CoQ10 supplementation has been shown to reduce many of the side effects of statin use, including myopathy and fatigue.”

The lifestyle effect

Lifestyle is quite a broad term and can take into account a huge amount of factors, namely exercise, dietary choices, and other sedentary habits.

“Lifestyle has a very big impact on our health; disrupted sleep can have a very broad hormonal impact and dysregulate all kinds of markers, for example,” Della Vedova explained. “Stress is linked with sleep and can impact our ability to regulate inflammatory response, initiating a cascade of events that can put our cardiovascular system under a lot of pressure. Never underestimate what a walk in the woods can do to our nervous systems, and hormones, or what a hug from a loved one can do to our stress levels. Looking after our physical bodies is a primal need.”

Bradshaw went on: “With stress and anxiety being so prevalent amongst many adults, this is perhaps one of the most important issues to address.

Taking adequate time to relax, walk (particularly in nature) and unplug from technology and social media can have profound benefits to stress levels and therefore heart health. Good sleep habits are essential too. Regular exercise or just regularly being active is crucial to heart health too.”

Briggs added: “The link between smoking and heart disease had been suspected since the 1940s but was confirmed in 1964. Passive smoking is associated with a 30 per cent increase in the risk of CHD and smokers will have an 80 per cent increased risk. Cigarette smoke decreases vasodilation, via the reduction of nitric oxide and increases inflammatory compounds such as cytokines. Smokers also have higher total cholesterol, triglycerides and LDL and lower HDL than non-smokers and the LDL is more likely to be oxidised.”

EXPERT ADVICE

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

Q

What nutrients are women most at risk of being deficient in during pregnancy and should supplements be recommended?

RUTH TURNER ADVISED: Pregnancy provides a unique and critical window of opportunity to implement healthy habits, and balanced nutrition during pregnancy is important, not only for the mother's health, but also to provide an environment for optimal development of the baby and support their future health.

Ensuring optimal intake of all nutrients is essential during pregnancy, but there are key nutrients that women may be at a higher risk of being deficient in.

Folate is essential for the formation of baby's brain and spinal cord, where it plays a role in the prevention of neural tube defects. The NHS recommend women take 400mcg of folate before and during the first 12 weeks of pregnancy. In individuals with MTHFR gene defects, thought to occur in around 40 per cent of the population, data suggests that prenatal supplementation with the active L-methylfolate is most successful at increasing folate levels.

Vitamin B12 is essential for baby's growth and development, particularly of the neural tube and the brain. In the diet, B12 is found in animal products, so those following a plant-based diet should take a supplement containing B12 both before and throughout pregnancy.

Iodine requirements increase during pregnancy to support the increase in maternal thyroid hormone production. Thyroid hormones regulate a wide range of physiological functions and are essential for normal child growth and development.

Vitamin D is essential in pregnancy for maintaining calcium homeostasis and therefore baby's bone development. Vitamin



D is synthesised in the skin when exposed to sunlight, so spending time outside in the summer months is encouraged. The NHS recommend taking a supplement containing 10mcg (400iu) from September-March during pregnancy, but levels up to 4000iu can be taken to correct a deficiency.

Iron requirements increase in pregnancy to support the manufacture of red blood cells as the mother's blood volume increases. Haem iron, found in red meat, has the highest bioavailability, so those following a vegetarian or vegan diet may be at risk of lower iron levels.

Optimal levels of other nutrients, including vitamin A, calcium, magnesium, selenium and zinc are also essential for supporting a healthy pregnancy, so a balanced pregnancy multivitamin is recommended.

Omega 3 fatty acids play an important role in supporting a healthy pregnancy, with the fatty acid, docosahexaenoic acid (DHA), providing the building blocks for baby's retinal and brain cells. Pregnant women should aim to eat two portions of oily fish per week, but where this isn't desirable or achievable, an omega 3 supplement can be supportive.



ABOUT THE EXPERT

Ruth Turner
PGDip

Nutritional Therapy, mBANT, rCNHC, is a Registered Nutritional Therapist at Cytoplan. Ruth studied at the University of Worcester and has been a qualified Nutritional Therapist for almost 10 years. She ran a successful private practice before joining Cytoplan in 2018, where she works as a Nutritional Therapist. Ruth's role includes supporting customers with tailored diet and supplement protocols and helping practitioners in their recommendations of supplements in practice. Ruth has a particular interest in female and children's health and undertakes regular CPD to stay up to date with the latest research.

Q

Collagen has grown hugely in terms of awareness, but where is it appropriate to supplement, and what guidance can you offer in terms of the right supplement to take?

MARTINA DELLA VEDOVA RECOMMENDED:

Collagen is a protein that gives structure to the tissues. In the human body, we know of about 28 different kinds of collagen. Different kinds have slightly different structures to serve a better function in different tissues.

Everyone knows of the presence of collagen in bones, joints, and skin, but it is important to remember that collagen is the component that gives a shape to internal organs, it protects and keeps our blood vessels elastic and stretchy, it is part of mucosal lining, and is part of muscle

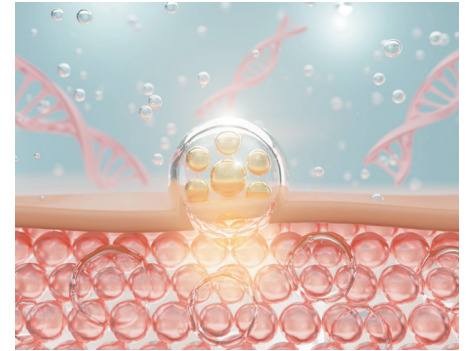
and connective tissue all over the body.

As we reach our mid-20s, our ability to make collagen starts declining, and by the age of 60, we have only 50 per cent of our collagen left in our tissues. Also, factors such as alcohol consumption, smoking, excessive sunlight, excess sugar intake, stress and nutrient deficiencies can speed up the collagen damaging process.

Consuming collagen-rich foods such as bone broths, and collagen promoting amino acids such as vitamin C-rich foods can help our own replenishment.

Supplements can be helpful in this respect as we can get significant amounts of collagen easily and in convenient formats. Finding products that can offer more than one kind of collagen is ideal: different kinds will complement each other and will have a more complete effect.

Also making sure that the collagen is easily absorbed is key. Collagen is a very big molecule that the body will need to break down before being able to internalise. Collagen in peptides form, meaning cut in shorter pieces, is much more bioavailable as it requires much less



effort by the body and it doesn't rely on the body's resources as much to digest it.

Powders can be found unflavoured (could be mixed in everything from coffee to smoothies or soups) or flavoured to make refreshing drinks. Powders normally can offer higher amounts per serving, reaching sometimes 10g per serving, and this could really be helpful for tissues such as cartilage, joints, bones, and teeth. Skin tissue requires a much less significant dose.

Collagen capsules can be helpful in maintaining tissues in good health or for who need less dosage daily.

ABOUT THE EXPERT

Martina Della Vedova (BSc, M.Sc,

CNMDip NT, mBANT, CNHCreg) obtained a Master in Functional Genomics in Italy and trained as a Nutritional Therapist in London. She has worked for NaturesPlus as a Nutritional Advisor since 2016 and sees clients privately.



Q

What properties are in red clover that make it so beneficial for menopausal women?

MAX LAMBERT EXPLAINED: Age-related oestrogen decline leads to the onset of menopause symptoms, which can have severe negative impacts on quality of life of women.

The core symptoms present as hot flushes and night sweats (collectively referred to as vasomotor symptoms) and sleep disturbance. Other secondary symptoms often occur and include sexual dysfunction, depression, anxiety, memory loss, fatigue, headaches, joint pain and weight gain. The natural decline in oestrogen also increases the rate of bone loss and risk of osteoporosis in women (1,2).

Plant derived bioactive isoflavones from fermented red clover selectively bind to estrogen receptor (ER) beta, which is expressed in tissues such as the brain, bone, kidney, liver, fat, and cardiovascular system, all of which require certain stimulation by oestrogen to function optimally. In this way, isoflavones can take on the regulatory roles of oestrogen without the negative side effects and risks of hormone replacement therapy by targeting ER beta and avoiding overstimulating the cancer sensitive tissues that are rich in ER alpha (3).

In plants, the active isoflavones are bound to glycoside molecules, which reduce the uptake of isoflavones. Fermentation can be used to enzymatically remove the glycosides and

enhance bioavailability of isoflavones.

Human clinical data has indicated that interventions with fermented isoflavones from red clover sources and pure aglycones exert enhanced beneficial effects compared to intake of raw (unfermented) isoflavone-rich foods. Research has also shown isoflavones to exert anti-inflammatory and antioxidative effects (2).

A three-month clinical study investigated the effect of taking 34mg/day of isoflavone aglycones from fermented red clover extract against vasomotor symptoms in menopausal women. The study is groundbreaking as it is the first to quantify nocturnal hot flushes/sweating during sleep. The study showed that isoflavone therapy significantly reduced the frequency and intensity of physiological hot flushes compared to placebo (4).

It is important to note that isoflavones are used as a dietary supplement for the treatment or prevention of oestrogen deficiency symptoms and diseases with milder effects. Isoflavones have great potential as a long-term and prophylactic treatment effective against oestrogen deficient bone resorption and vasomotor symptoms. Results of clinical studies support that isoflavone supplementation (especially with isoflavone aglycones) significantly reduce bone mineral density (BMD) loss in osteopenic women with oestrogen deficiency (5). A two-year clinical intervention study treating female patients with osteoporosis with isoflavone aglycones (54mg/day) showed a clear increase in BMD compared to a control group (6).

Human data supports that isoflavones from

fermented red clover are a safe prophylactic treatment option for peri- and post-menopausal women suffering from menopausal symptoms and/or low bone density.



ABOUT THE EXPERT

Max Lambert holds a PhD in Medicine

from Aarhus University (2017) and has been carrying out leading clinical research into the effects plant derived bioactive compounds on human health since 2013. He has a strong background in clinical research, health, nutrition, and food technology, with more than 15 publications in human intervention studies and meta-analyses published in scientific peer reviewed journals. His focus is on nutrition and dietetics, health, epidemiology, endocrinology, age-related disease, bioavailability, and inflammatory diseases. He has held positions as Assistant Professor and Post Doc at the Department of Clinical Medicine at Aarhus University and is a lecturer for a number of courses in M.Sc. program, Molecular Nutrition and Food Technology. He is a member of the Organic Green Kale and Innosweet projects in Denmark and has previously been a member of the Nutrition Society in the UK.



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A practitioner guide to choline

Keri Briggs takes us through the mechanisms of choline, and the well-evidenced areas of use.

Choline is a water-soluble nutrient, which was defined as essential in 1998 by the FDA in the US and its varied roles are still not universally understood by healthcare practitioners. It is an essential nutrient, related to the B vitamins and many of its functions are interrelated with folate (vitamin B9) and homocysteine.

Whilst there is a mechanism by which the body can make choline from the amino acid, methionine, folate and vitamins B6 and B12, studies have established this process is often insufficient to meet the body's requirements and therefore choline must be consumed in

the diet. One of the best food sources is liver, providing 414mg per 100g but other food sources include:

- Salmon – 187mg per 85g.
- Egg yolks – 140mg per egg.
- Soya beans – 107mg per 38g.
- Chicken breast – 72mg per 85g.
- Minced beef – 72mg per 85g.
- Cod – 71mg per 85g.
- Quinoa – 60mg per 93g.
- Kidney beans – 45mg per 32g.

Choline can also be found in nuts, seeds, grains, fruits and vegetables at lower levels. The choline metabolite, betaine, can also be found in

a number of foods, particularly plant-based, and can act as a methyl donor, thus sparing some dietary choline for other functions.

Adequate intake levels have been set, however, many people fail to obtain this amount from their diets, with some consuming as little as 27 per cent of their requirement. Genetic polymorphisms, or SNPs as they are sometime known, can also affect the level of dietary choline required by an individual but also the response they have to inadequate choline intake, with some causing an individual to be 15 times more likely to develop symptoms if choline intake is low.



The methylation cycle

One area choline is of particular importance is correct functioning of the methylation cycle, which is essential for many biological processes, including gene expression, hormone, neurotransmitter and amino acid expression, detoxification and growth and development. It plays a key role in converting homocysteine to methionine and is a key methyl donor in this process.

Symptoms of poor methylation can include low mood and anxiety, sleep issues, allergies, muscle pain and headaches and high levels of homocysteine have been associated with a wide range of degenerative conditions, including heart disease and cognitive impairment. Higher intakes of choline are associated with lower homocysteine levels and studies have also found that supplementing with choline reduces homocysteine as effectively as folate.

For pregnancy

Another area in which choline is vital is during pregnancy and breastfeeding as requirements increase by 20 per cent and 30 per cent respectively, with intakes falling 130-200mg short of this requirement.

Studies suggest that even prior to pregnancy, choline intakes in women are below optimal and when asked, only 21 per cent of people were aware of the importance of choline during pregnancy and breastfeeding, with as little as seven per cent of women achieving an adequate intake during pregnancy. Choline is of particular relevance in early pregnancy as good intake has been shown to decrease the risk of neural tube defects (NTDs) such as spina bifida, by as much as 50 per cent.

As mentioned, choline also lowers homocysteine, and this is another function which has positive effects on pregnancy. Higher levels of homocysteine at this time can affect both maternal and foetal health and have been linked to gestational diabetes, pre-eclampsia, pre-term birth, placental abruption, miscarriage and foetal growth restriction.

Choline is a key nutrient in brain development in the foetus, as well as in exclusively breast-fed babies, and this has been linked to the effects choline has on the production of the neurotransmitter, acetylcholine (ACh). ACh is required for many functions related to nerve cells, including proliferation, maturation and survival as well as for the development of synapses in the nervous system. It is also required for the production of other compounds relating to cognition and growth, including the cell membranes required for brain development.

Ongoing studies have supported the idea that supplementing the maternal diet with choline can have long lasting benefits on offspring and these results have been confirmed by studies in humans. One found that the addition of choline reduced the risk of poor attention and mental illness whilst another found that reaction times, and therefore processing speeds, memory, and recognition are better in infants whose mothers have a higher intake of choline in their third trimester. Processing time is also predictive of IQ in early childhood and benefits appear to endure for at least one year after birth.

There is also evidence to support the use of choline for cognitive function in older adults, relating back to both its effects on ACh production and homocysteine reduction. Studies have confirmed that choline can improve verbal memory in those aged 60-80 and can lower the risk of dementia and improve cognitive performance in those aged 42-64. One study has even shown that an intake of above 187mg a day reduces the risk of low cognitive function by 50 per cent.

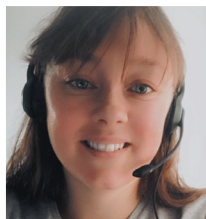
The role of the liver

Diets deficient in choline are associated with poor liver function and accumulation of fat in the liver, which is known as hepatic steatosis. Functions of choline which directly relate to liver function include fat and lipid metabolism and circulation of bile and cholesterol, but the effects choline has on membrane fluidity, mitochondrial function and the methylation cycles can all also have significant effects.

Studies have shown that humans consuming a diet low in choline develop fatty liver and damage to liver cells, via the accumulation of triglycerides in the liver. Low choline intakes are also associated with an increase in disease progression and increased fibrosis in those with NAFLD. Many of the liver benefits seem to be linked to the role it plays in lipid transportation.

One of the most important functions of choline in liver health is its role as a precursor of the phospholipid, phosphatidyl choline (PC). PC is involved in packaging triglycerides and removing them from the liver, as well as assisting with the elimination of cholesterol. It is likely to play an indirect role in glucose metabolism, making it an important element in liver health. Choline deficiency causes decreases in methylation and PC production, as well as issues with lipid metabolism, which cause a characteristic build-up of fats in the liver. If this continues, DNA can become damaged and cells dysfunctional, causing scarring and loss of function.

Given the importance of choline for a number of physiological functions, as well as its benefits in certain conditions, it is a nutrient that far more practitioners should be aware of. As it is safe and generally well-tolerated at a level of up to 3.5g in adults, and has no known interactions with medications, it is certainly a nutrient to consider for anyone planning a pregnancy, pregnant or with health concerns around cognitive function, heart health or liver function.



Keri Briggs is Senior Nutrition and Technical Advice Specialist at Lamberts Healthcare. She graduated in 1999 with a BSc in Human Nutrition and has worked for Lamberts since 2000, where she has been involved with training, clinical trials and writing PR and trade articles, as well as advising trade customers and consumers.

GET CREATIVE WITH SHALLOTS

Discover these healthy dishes using the humble shallot.



SHALLOT PISTO WITH
MANCHEGO EGGS



DAAL WITH
SHALLOT TEMPER



GRILLED SHALLOTS
AND SPRING ONIONS
WITH ROMESCO



SHALLOT PISTO WITH MANCHEGO EGGS

Serves 4

Pisto is a vegetarian Spanish dish similar to ratatouille or caponata. Here, we've topped it with a crispy Manchego fried egg, making it the perfect brunch, lunch or even dinner.

INGREDIENTS:

- 4tbsp sultanas
- 50ml sherry vinegar
- 60ml extra-virgin olive oil
- 4 shallots, peeled and cut into 2cm cubes
- 1 red pepper, deseeded and cut into 2cm cubes
- 1 aubergine, trimmed and cut into 2cm cubes
- 2 courgettes, trimmed and cut into 2cm cubes
- 1 garlic clove, peeled and minced
- 1tbsp dried oregano
- 4 ripe tomatoes, roughly chopped

- 3tbsp toasted pine nuts
- Salt and black pepper
- 4tbsp chopped parsley
- Vegetable oil, for frying the eggs
- 100g Manchego, grated
- 4 eggs
- 1 big pinch smoked paprika, to serve

METHOD:

- Put the sultanas and sherry vinegar in a small bowl and leave to plump up.
- To make the pisto, put the extra-virgin olive oil in a large, deep frying pan on a medium heat. Once it's hot, add the shallots and red pepper, and fry, stirring occasionally, for about five minutes, until soft. Add the aubergine, cook for two minutes, then add the courgette and cook, stirring from time to time, for a couple of minutes, until all the vegetables are soft.

- Stir in the garlic and oregano, cook for a minute, then add the tomatoes and cook on a very low heat, stirring occasionally, for 15-20 minutes, until they reduce and turn saucy. Strain the sultanas, discarding the vinegar, then add them to the pan with the pine nuts. Season to taste, then take off the heat and stir in the parsley.

- Add a little vegetable oil to a medium frying pan on a medium heat – add a little pile of grated Manchego and once it's melted, crack an egg on top. Add a little more Manchego around the borders of the eggs. Fry until the egg white is set and the cheese is golden and crispy.
- Transfer the pisto onto dishes and top with the eggs, then finish with a drizzle each of extra-virgin olive oil, a good pinch of smoked paprika and pepper.

DAAL WITH SHALLOT TEMPER

Serves 4

This comforting daal is the perfect weeknight dinner – and it’s even more delicious for lunch the next day.

INGREDIENTS:

- 300g moong dal
- 1½ litres water
- 4tbsp unsalted butter
- 1½ tsp cumin seeds
- 4 echalion shallots, peeled and finely sliced
- 2 green finger chillies, very thinly sliced
- 5 garlic cloves, crushed
- ½ tsp ground turmeric
- 1tsp garam masala
- 1½ tsp salt (or to taste)

METHOD:

Wash the dal until the water runs clear, then drain. Place in a deep saucepan and cover with 1½ litres of water. Bring to the boil, turn down the heat, and simmer for 30–40 minutes, until tender.

Meanwhile, put the butter into a frying pan over a medium heat and, when hot, add the cumin seeds and echalion shallots. Cook for about five minutes, then add the green chillies and garlic. Cook for another five minutes, or until the shallots start to brown, then add the turmeric and garam masala.

Pour most of the temper into the dal and stir, adding the salt to taste. Add a little hot water if the daal is too thick. Check the seasoning, then top with the remaining temper.

Serve with plain basmati rice, chapati, pickle and yoghurt.



Recipes courtesy of ukshallot.com – for professionals and passionate cooks



GRILLED SHALLOTS AND SPRING ONIONS WITH ROMESCO

Serves 4, as a side

This dish is a great way of making use of a couple of leftovers: the pangrattato is fried breadcrumbs from a stale loaf and the maltagliati is essentially pasta offcuts. When you are making a lot of pasta, you get left with lots of bits that weren't quite the right fit; let them dry out and keep in a pile and you have a quick, easy, free lunch. If you aren't making pasta, you can just roll out a batch of your favourite pasta and cut it into raggedy shape or alternatively just use your favourite store-bought dried pasta or break up some dried lasagne sheets.

INGREDIENTS:

FOR THE ALLIUMS:

- 5 echalion shallots, peeled and halved
- 1 bunch of spring onions
- 2tbsp extra virgin olive oil
- Handful of parsley, finely chopped
- Handful of tarragon, finely chopped

- Zest and juice of 1 lemon
- Flaky sea salt and black pepper, to taste

FOR THE ROMESCO:

- 1tbsp olive oil
- 1 slice stale white bread, torn roughly into 2cm chunks
- 50g almonds
- 1 garlic clove, peeled and sliced
- 100g roasted red peppers, from a jar, drained
- ½ tsp smoked paprika
- 2tbsp sherry vinegar
- 100ml extra virgin olive oil
- Salt and pepper, to taste

METHOD:

■ Toss the echalion shallots and spring onions in a large bowl with the 2tbsp olive oil, herbs (reserving a few leaves for garnish), lemon zest and juice, and seasoning. Put to one side to

marinate.

■ Meanwhile make the romesco sauce – heat the 1tbsp olive oil in a frying pan and fry the bread chunks, almonds, and garlic until golden.

■ Add the bread mix to a blender with the roasted red peppers, smoked paprika, sherry vinegar, 100ml olive oil and salt, and blend into a lightly textured sauce.

■ Put a griddle pan or barbecue on a high heat, and once smoking hot, add the marinated shallots. Cook for a few minutes on each side until charred and soft. Remove to a plate. Add the spring onions – these will only take up to one minute per side to get charred and soft.

■ Serve the alliums on a platter topped with the remaining herbs and a little more of the flaky sea salt, with the romesco sauce alongside.

I-MAG GIVEAWAYS

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

Viridian D-Ribose Energy Complex

D-Ribose Energy Complex, a nutritional kick-start providing high-potency support. Featuring clinically researched ingredients ribose, together with supportive nutrients, magnesium, acetyl-L-carnitine and malic acid. Magnesium contributes to the reduction of tiredness and fatigue, supports electrolyte balance and normal muscle function. Simply stir into water or your favourite juice to create



a great-tasting energising drink. Viridian's D-Ribose contains 100 per cent active ingredients with no binders or fillers. Vegan, palm oil free and non-animal tested.
I:Win: We have two to give away.

Equilibrium Labs de-liver-ance

The ingredients in this fast-acting formula, de-liver-ance, are scientifically designed with a proprietary blend of herbs, roots and extracts that help you to be your best, every single day. de-liver-ance helps to promote mental alertness, reduce the negative effects of toxins on the body, help maintain optimum liver health and keep you glowing, inside and out. The one-shot formula starts working within minutes to improve balance and achieve optimum mental and physical health.

I:Win: We have three to give away.



BetterYou Bone & Joint Health Bundle

Did you know we reach peak bone mineral density during our mid-20s? After the age of 35, bone loss increases gradually as part of the natural ageing process. This means that we need to be proactive from an early age to prevent bone density loss. BetterYou's Bone & Joint Health



Bundle contains the key nutrients essential for supporting flexibility, strong bones and skeletal strength.

I:Win: We have three bundles to give away.

Good Health Naturally Ionic Iron

Experience the power of Good Health Naturally's Ionic Iron! This smart choice for iron supplementation delivers a high absorption rate, making it practical for addressing iron levels without causing stomach discomfort. This gentle and efficient liquid iron supports energy production, immune health, cognitive function, and much more. The metered dropper allows for flexible dosing and is an alternative to tablets.

I:Win: We have five to give away.



Hifas da Terra Mico-Rei

Mico-Rei is a premium food supplement with a potent concentration of active ingredients sourced from reishi (*Ganoderma lucidum*), often referred to as 'the mushroom of eterna youth'. Made from a certified organic 15:1 reishi extract cultivated on mature wood, each capsule contains alpha and beta-D-glucans, triterpenoid compounds, and alpha-linolenic acid. Additionally, standardised amounts of vitamin C from *Malpighia glabra* are included per capsule. Renowned for its antioxidant, anti-inflammatory, and immune-modulating properties, reishi offers a multitude of health benefits.

I:Win: We have one to give away.



Power Diary Ensures Unrivalled Data Security: ISO 27001 Certification Earned



Your Patients Deserve the Best - Choose Power Diary, the Trusted & Certified Practice Management Software

In today's digital world, safeguarding sensitive healthcare data is paramount. Power Diary, a leading practice management software for allied health practitioners, proudly announces its ISO 27001 certification for information security management. This certification demonstrates our unwavering commitment to maintaining the highest global security standards for your valuable patient data.

Damien Adler, Power Diary co-founder and registered psychologist, emphasised, "Becoming ISO 27001 certified is a testament to our dedication to data security. We are committed to ensuring the security of our customers' health information."

Paul Adler, CTO and co-founder, added, "Our team has ensured that our software and operations meet the strict requirements of the ISO 27001 standard. This certification validates our efforts and provides customers with confidence in choosing a company that takes security seriously."

The ISO 27001 certification encompasses implementing, maintaining, and continuously improving an information security system. Power Diary adheres to global best practices, ensuring the highest standards in handling sensitive health data.

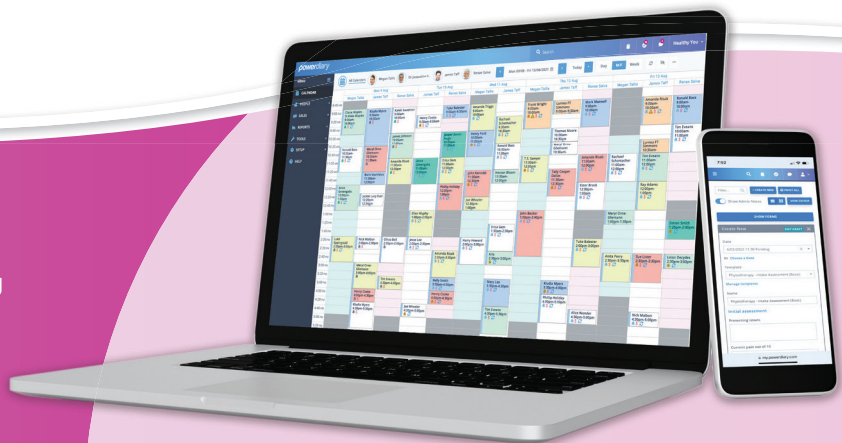
Beyond certification, we invest in state-of-the-art security infrastructure, robust processes, and industry best practices. Your patients' data is protected, allowing you to focus on delivering exceptional care.

Choose Power Diary, the trusted industry leader for allied health practitioners worldwide, to safeguard your patients' data. Join the healthcare revolution today and experience the Power Diary difference.



"Our dedication to global best practices is crucial when handling sensitive health data, and this certification solidifies our commitment to maintaining the highest standards."

Damien Adler
Power Diary Co-Founder



**Software that's Audited.
Verified. Certified.**

To learn more about how Power Diary can revolutionise your practice and protect your patients' data, visit www.powerdiary.com/security. Your data security is our top priority.

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