



Nutrition I-Mag

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SEPTEMBER/OCTOBER 2022

IMMUNE SCIENCE

What the latest research is telling us about building strong immune systems



Must-have mushrooms

Why medicinal mushrooms offer such varied benefits

Practitioner guide to joints and bones

Expert advice when assessing musculoskeletal issues



BioCare Education Series Autumn 2022

This autumn we take apart the complex subject of gut health and take a deep dive into the intricate world of the human microbiome. As always, we take the science, but distil it into practical protocols, exemplified by real case studies. And we have online and face to face events to suit your preference. Enjoy education from the comfort of your own home or have a day out to learn and network with other professionals in a friendly and welcoming environment! It's CPD with a heart, and a fun side.

The Microbiome Summit **ONLINE**

10.00am -2.00pm BST, 7th September

It's not just your own biology that influences your health.

We've evolved to live alongside a complex internalised ecosystem of microorganisms, and are functionally interconnected. The resulting metabolome produced by all cells is the key to health. But what is the nature of that ecosystem, how exactly does it influence health and how does it develop? What is the role of probiotics, prebiotics and even post-biotics? After busting some myths about the microbiome, we will also look beyond the adult gut, at the specifics of the infant microbiome and its importance to baby health, as well as the skin and genitourinary microbiome.

3 hours CPD (BANT, ANP, NNA, NTOI).

IF YOU'RE NOT ABLE TO WATCH LIVE, A RECORDING WILL BE AVAILABLE TO ALL REGISTRANTS 24HRS LATER.

free

The Gut, Unravelled **FACE-TO-FACE**

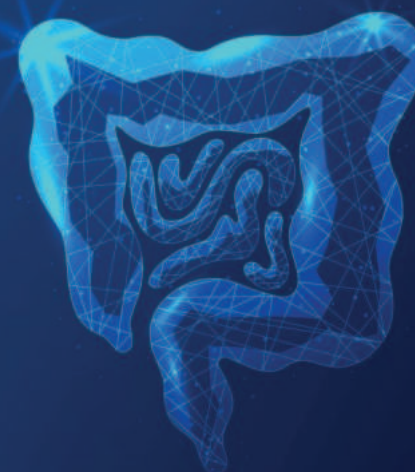
Seminar with Alessandro Ferretti & Chris Newbold - 10.00am - 3.00pm BST

Time to get to the core of all human physiology as we unravel the complex subject of gut health and its multifaceted links with other systems! Gut is our 'outside inside', the metabolic interface where two complex biological and chemical worlds interact in a dynamic, hybrid ecosystem, part human, part other.

Its active barrier function enables it to play multiple roles sensing, defending, ingesting, detoxifying, and creating, such that gut impacts everything, and everything can impact the gut. In this seminar we examine the adaptive role of the gut, taking a holistic ecological perspective, touching on digestion, motility, integrity and microbial balance, using case study examples, and equipping you to take an effective whole system approach to improving clients' health.

| | | | |
|-----|--------|------------------------------|------------|
| Wed | 21 Sep | Bute Park Education Centre | Cardif |
| Wed | 28 Sep | Midlands Arts Centre | Birmingham |
| Wed | 2 Nov | Penny Bohn | Bristol |
| Tue | 8 Nov | Exeter Library | Exeter |
| Sat | 12 Nov | Cavendish Conference Centre | London |
| Tue | 22 Nov | York Medical Society | York |
| Wed | 23 Nov | Apex International | Edinburgh |
| Wed | 30 Nov | Pendulum Hotel | Manchester |
| Tue | 6 Dec | Jurys Inn (near the station) | Brighton |

4 hours CPD (BANT, ANP, NNA, NTOI). Drinks and snacks provided; lunch available to purchase locally.



In partnership with:



Welcome



An autumn issue of *Nutrition I-Mag* always brings with it an immune focus, given the approaching cold season is when most people are most at risk of falling ill. And immunity has never been more in the spotlight than it has in recent years since the arrival of Covid-19 made us all think far more about our health defences.

While Covid seems to be less of a focus at the moment, especially as other critical issues, such as the cost-of-living crisis, rises up the agenda, all of these are interlinked in terms of our health; those most vulnerable are likely to be eating less healthily when household budgets are pinched.

In this issue, we discuss all of the issues around immune health with our panel of experts, who offer advice on how best to support your clients during the autumn and winter. You can read all about it by **clicking here**.

Another effect of the pandemic was the lack of in-person education, and we are delighted to have been able to resume some of the IHCAN Conferences in a live format this year, creating a hybrid model of in-person and virtual events. Our last in-person event for 2022 has taken place, and we now turn to the final virtual offering, taking place in November. By attending, you can not only earn important CPD points, but you can also network with some key suppliers in the nutrition industry. **Click here** to book your place at November's event.

And do remember that by reading *Nutrition I-Mag*, you can also build more CPD points. Simply **click here**, where you will be asked to answer some questions to earn your points.

RACHEL SYMONDS, EDITOR

Rachel

NUTRITION I-MAG, Target Publishing Limited, The Old Dairy, Hudsons Farm, Fieldgate Lane, Ugley Green, Bishops Stortford CM22 6HJ

t: 01279 816300 e: info@targetpublishing.com www.nutritionimag.com

Meet The Team

EDITOR Rachel Symonds **CONTRIBUTORS** Gemma Khoo, Lucy Parry, Dr Miriam Ferrer, Alice Bradshaw
SALES & PUBLISHING DIRECTOR Ruth Gilmour e: ruth.gilmour@targetpublishing.com **KEY ACCOUNTS DIRECTOR** Abigail Morris e: abigail.morris@targetpublishing.com
SALES MANAGER Natalie Clark e: natalie.clark@targetpublishing.com **DESIGN/PRODUCTION** Louise Salisbury e: louise.salisbury@targetpublishing.com
MARKETING DIRECTOR James Rix e: james.rix@targetpublishing.com
ACCOUNTS Lorraine Evans e: accounts@targetpublishing.com
MANAGING DIRECTOR David Cann e: info@targetpublishing.com

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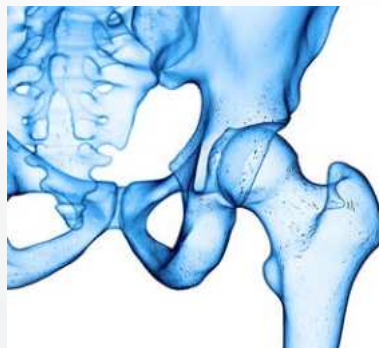
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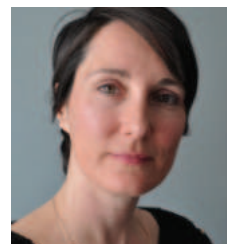
Each issue, *Nutrition I-Mag* enjoys contributions from many leading authorities in the nutrition world.

This issue, our writers include:



Lucy Parry

Lucy Parry MChem (Hons) joined the team at Lamberts Healthcare as Senior Brand Specialist in 2020, having completed her Chemistry Integrated Master's at the University of York. Whilst her studies were primarily focused on medicinal chemistry, Lucy's interest in health and natural products led her into the exciting field of nutrition.



Lindsay Powers

Lindsay Powers is a Nutritional Therapist and works as the Health Coach Manager at the supplement brand, Good Health Naturally.



Sophie Barrett

Sophie Barrett is a Medical Herbalist and Mycotherapy Adviser at Hifas da Terra. Sophie studied Herbal Medicine and Naturopathy at The College of Naturopathic Medicine, gaining over five years of clinical training and research. She set up her own practice to educate and serve patients seeking optimum health. Sophie's mission is to empower people to look after their own health from a preventative perspective, harnessing the healing power of plants and fungi.



Alice Bradshaw

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



Gemma Khoo

Gemma Khoo BSc (Hons), MSc is Nutritionist and Regulatory Affairs Manager at Nutri Advanced. Gemma came to Nutri Advanced after completing a Masters in Nutrition at King's College London and has been a key member of the nutrition department for over 10 years, bringing extensive product and technical knowledge. Gemma manages regulatory affairs for Nutri Advanced, as well as the product development.



Claire Barnes

Claire Barnes has a diploma in Naturopathic Nutritional Therapy from the College of Naturopathic Medicine. She is a Technical Advisor at ADM Protexin, manufacturers of Bio-Kult and Lepicol. Claire worked within the retail buying sector for three years before a year travelling. It was whilst travelling she developed her love of juicing and nutrition and started her own juice bar business. When she sold the business, she wanted to advance her knowledge of nutrition and began her nutritional therapy training. She now concentrates her research in the microbiome and digestive health.

News Bites

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

INEQUALITIES IN HEALTH AMONG IRISH CHILDREN REVEALED IN NEW REPORT

Children and teens are more physically active but inequalities remain, Ireland North and South Report Card has revealed.

Physical activity levels in children and teenagers across Ireland and Northern Ireland have improved slightly over the past eight years but not all children and teens have an equal chance to be active, according to the new Active Healthy Kids Report Card.

The Ireland North and South Report Card on Physical Activity for Children and Adolescents has found a slight improvement in overall physical activity levels across the island of Ireland since 2016 but has also identified a number of inequalities.

The Report Card was produced as part of the Active Healthy Kids Global Alliance, established in 2014 to create a world of active, healthy kids. Close to 70 countries have signed up and taken part in the global alliance to date. Under this global initiative, all Report Cards are generated using a standardised grading system, with grades from A for succeeding with a large majority of children to F for succeeding with few children.

The 2022 Report Card is the third report of its kind for Ireland and Northern Ireland and provides a grade across 11 indicators for physical activity among children and teenagers.

Across the island of Ireland, it is recommended that children and adolescents, aged six-17 years, attain on average 60 minutes per day of moderate-to-vigorous intensity physical activity throughout the week. On evaluating data across both jurisdictions, the team of investigators awarded a C minus grade for overall physical activity in children and teens across the whole island, representing a slight improvement on the D grade awarded in 2016.

The team of investigators – from Ulster University, Institute of Public Health, Dublin City University, Munster Technological University, University of Limerick, Technical University of Shannon, University College Cork, University of Strathclyde, and University of Eastern Finland – also found evidence of inequalities across a range of indicators, with disability, gender, social economic status and age all impacting on physical activity levels.

The 2022 Report Card made several recommendations, including the need to further develop policy measures to address the inequalities identified and the need for a framework for the systematic surveillance of indicators related to physical activity for children and teens with disabilities.

Professor of Exercise and Health at Ulster University, Marie Murphy, commented: “The 2022 Ireland North and South Report Card highlights progress made in the promotion and uptake of physical activity among children and adolescents across the whole island of Ireland. It is encouraging to see the improvement in the overall grade, which shows that children and adolescents are more physically active compared to the previous 2016 Report Card. However, it also shows that not all children have an equal opportunity to be physically active, pointing to the need to address a range of inequalities as identified in this Report Card.”

Chair of the research working group, Dr Angela Carlin, School of Sport at Ulster University, added: “Gender inequalities were also evident with more males than females meeting physical activity guidelines, in particular in teenagers, while we also found inequalities in socioeconomic status, with children and teens from poorer backgrounds meeting guidelines less often. The findings underscore the need to respond to these inequalities to give all children and teenagers an equal opportunity to be physically active and healthy.”



Wide variations in worldwide vitamin C guidance, new report finds

A leading supplement organisation has revealed that daily vitamin C recommendations vary significantly worldwide, even though the data underlying them are broadly the same.

In the Mind the Gap resource, from IADSA, the international alliance for the supplement sector, it explains that research shows there is an almost threefold difference between the lowest and the highest recommendations for vitamin C issued by national and regional health authorities. Some scientists are now calling for an alignment of guidance to help people attain optimum vitamin C status.

Full details are outlined in the latest Mind the Gap story, 'A world of difference: Why do global recommendations for Vitamin C vary so widely?' Available to view at iadsa.org/mind-the-gap/english/vitamin-c/intro, it also explores the case for reviewing daily vitamin C intake recommendations for specific demographic groups, including pregnant and lactating women, smokers, the elderly, and people who are obese.

Vitamin C prevents scurvy, a disease that was once common among sailors, but is thankfully now rare. However, it also performs

a number of important functions in the body. In particular, it is a major scavenger of free radicals, helping to protect cells from oxidative damage. It also helps to maintain healthy skin, bones and cartilage, and supports the immune and nervous systems.

Dr Gerhard Gans, Chair of IADSA, commented: "The benefits of vitamin C stretch well beyond the prevention of scurvy into a range of other key areas of health and wellbeing. To optimise people's vitamin C status, IADSA believes that greater consideration needs to be given to the setting of appropriate daily intake recommendations. We agree that aligning the criteria used for establishing these would be a positive step."



Administrators confirm 143 people made redundant at health wholesalers

It has been confirmed that 143 members of staff have been made redundant as the wholesalers, Tree of Life and The Health Store, have gone into administration.

Chris Pole and Ryan Grant, from Interpath Advisory, were appointed to Tree of Life UK Limited and Health Stores (Wholesale) Limited, on August 22, 2022. In a statement, Interpath said of the 206 employees across the two company sites in Newcastle-under-Lyme and Nottingham, 63 were retained to assist the administrators in the realisation of assets and the performance of their statutory duties. Regrettably, the remaining 143 members of staff have been made redundant.

"Over recent months, the group has faced a number of challenges including an unexpected sales decline following the loss of a large customer, and unprecedented market conditions that have impacted on financial performance. Despite significant efforts by the company to avoid insolvency, the directors reached the conclusion that it was in the best interest of creditors for the company to be placed into administration," the statement read.

"The Joint Administrators are exploring a number of options including seeking a buyer for the businesses, their assets and intellectual property."

Chris Pole, Managing Director at Interpath and Joint Administrator, commented: "Regrettably, the loss of business from a key customer, together with the effects of the well documented economic headwinds, including inflationary pressures, have been incredibly challenging for Tree of Life UK Limited and Health Stores (Wholesale) Limited.

"Our immediate priority is to assist those members of staff who have been made redundant and provide them with the information they require to make appropriate claims."

AWARENESS GROWS AROUND VITAMIN K2

A new survey has revealed that the use and awareness of vitamin K2 is continuing to grow.

The Industry Transparency Center announced a new survey of 3,500 dietary supplement consumers. The ITC Insights – 2022 Supplement Consumer Survey was a breakdown of supplement consumers, which included 1,000 from the US, 1,000 from China, 500 from the UK, 500 from Germany, and 500 from Italy. Participants identifying as female represented 52 per cent of respondents, and men represented 48 per cent, with ages ranging from 18 to 65-plus years.

Key findings included that 63 per cent reported 'I am proactive about my health and take steps to lower health risks', while 76 per cent said, 'I use/have used vitamins, minerals, herbs or other dietary supplements to help manage my health'. Furthermore, 62 per cent reported using vitamin K2 supplements, ranking in the top 10 ingredients used. The 18-54 age group brackets showed an increase in usage of vitamin K2 compared to those 55-plus.

No single supplement increased usage across every country, however, vitamin K2 was one of the closest to achieving universal growth. K2 also saw a sharp increase in use from 2020-2022.

Perceived effectiveness of K2 was greater in total supplement users surveyed compared to regular users. Bone and

heart health ranked as the top reasons for using vitamin K2, especially for regular users, while irregular users noted various reasons, including bioavailability of other supplements. Brain health and mental acuity also ranked relatively high and have a low gap between irregular and regular users. Researchers believe this partially confirms the earlier hypothesis of potential opportunities in this area.

"This survey confirms what we see commercially in many ways. Consumers have a high trust and interest in vitamin K2, especially those looking for specific health benefits," commented Xavier Berger, Global Market Manager with Gnosis by Lesaffre.

"It is also nice to see that 'quality/efficacy' (i.e., proof that it works), and 'safety' are recognised in the branded ingredients. MenaQ7 is a standout vitamin K2 in this regard, as it is the only K2 as MK-7 with clinical validation confirming bone and cardiovascular benefits. Very interesting is that 67 per cent of consumers said they look for a specific vitamin K2 brand while purchasing their supplements, and our two brands – MenaQ7 K2 as MK-7 and vitaMK7 – are in the top three brands most sought out."

In Research

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

Study confirms echinacea's anti-viral benefits

Echinacea has been found to reduce risk of respiratory infections, adding to the body of evidence around its anti-viral benefits.

Writing in the journal, *Frontiers in Nutrition*, researchers explained that SARS-CoV-2 vaccination is effective in preventing severe Covid-19, but efficacy in reducing viral load and transmission wanes over time. In addition, the emergence of novel SARS-CoV-2 variants increases the threat of uncontrolled dissemination and additional antiviral therapies are urgently needed for effective containment.

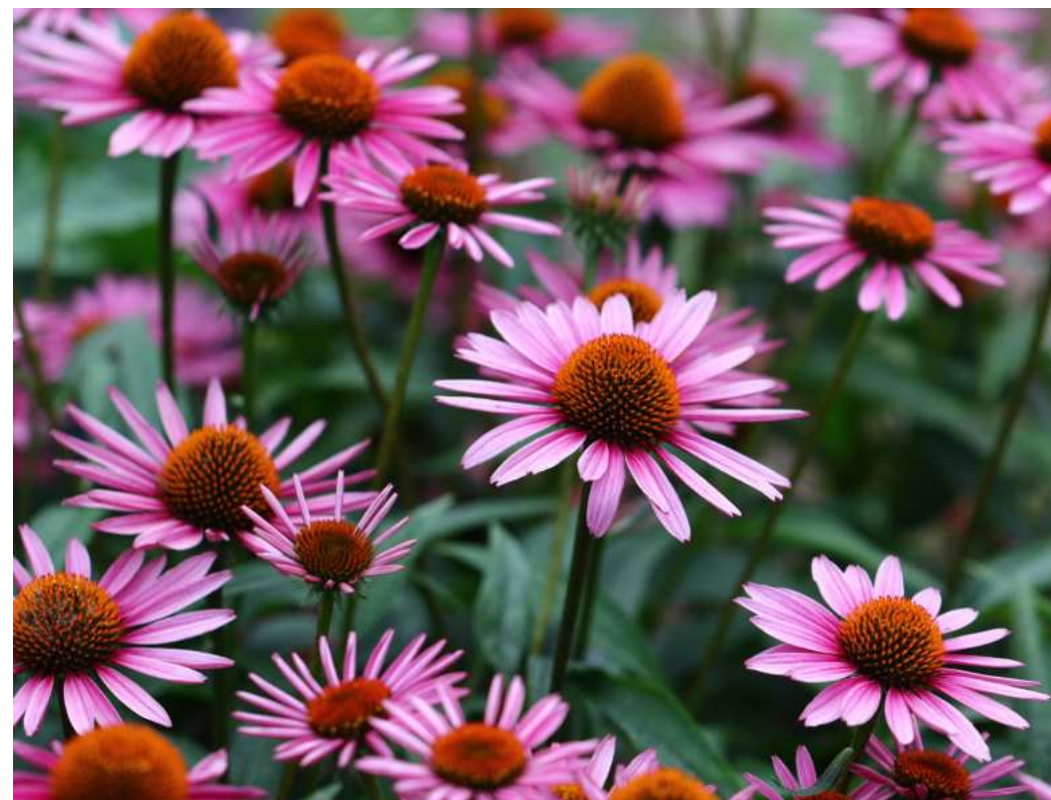
They explained that in previous in vitro studies, *Echinacea purpurea* demonstrated strong antiviral activity against enveloped viruses, including SARS-CoV-2. In this study, they examined the potential of *Echinacea purpurea* in preventing and treating respiratory tract infections (RTIs) and in particular, SARS-CoV-2 infections.

In total, a 120 healthy volunteers (aged 18-75 years) were randomly assigned to echinacea prevention or control group without any intervention. After a run-in week, participants went through three prevention cycles of two, two and one month with daily 2,400mg *Echinacea purpurea* extract (Echinaforce, EF). The prevention cycles

were interrupted by breaks of one week. Acute respiratory symptoms were treated with 4,000mg EF for up to 10 days, and their severity assessed via a diary. Naso/oropharyngeal swabs and venous blood samples were routinely collected every month and during acute illnesses for detection and identification of respiratory viruses, including SARS-CoV-2 via RT-qPCR and serology.

Summarised over all phases of prevention, 21 and 29 samples tested positive for any virus in the EF and control group, of which five and 14 samples tested SARS-CoV-2 positive. Overall, 10 and 14 symptomatic episodes occurred, of which five and eight were Covid-19. EF treatment when applied during acute episodes significantly reduced the overall virus load, the time to virus clearance, and also significantly reduced fever days. There were fewer Covid-19 related hospitalisations in the EF treatment group.

"EF exhibited antiviral effects and reduced the risk of viral RTIs, including SARS-CoV-2. By substantially reducing virus loads in infected subjects, EF offers a supportive addition to existing mandated treatments like vaccinations. Future confirmatory studies are warranted," the researchers wrote.





Micronutrient status and weight linked with breast cancer risk

New research has suggested an association between obese women, low levels of micronutrients and breast cancer risk.

The study, published in the *Nutrients* journal, investigated the association between micronutrient intake and breast cancer risk in South Korean adult women. This association was stratified according to body mass index (BMI) categories.

Data from the Korean Genome and Epidemiology Study (KoGES) and the Health Examinee Study were analysed, with 63,337 individuals (aged ≥40 years) completing the baseline and first follow-up surveys; 40,432 women without a history of cancer at baseline were included in this study. The association between micronutrient intake and breast cancer was determined by estimating the hazard ratio (HR) and 95 per cent confidence interval (CI) using the Cox proportional hazard regression model.

The researchers reported that analysis of 15 micronutrients and breast cancer risk revealed that none of the micronutrients were associated with breast cancer risk after adjusting for covariates. In obese women, the risk of breast cancer was found to be significantly reduced in the group that consumed vitamin C more than the recommended level, as well as vitamin B6 levels above the recommended level.

The researchers said in conclusion: "In obese women, exceeding the recommended daily intake levels of vitamin C and vitamin B6 was associated with a lower risk of breast cancer. However, other micronutrients were not associated with breast cancer risk in these women."

Data reports boom in sustainable fish oil consumption

New research has revealed a boom in sustainable fish oil consumption with nearly two million packets and bottles bought in the UK last year.

More UK consumers than ever before want to improve the environment and the health of the oceans when they decide which fish and krill oil supplements to buy, according to the new figures by the Marine Stewardship Council (MSC), the international not for profit responsible for the world's most widely used sustainable seafood ecolabel.

Consumers in the UK and Ireland spent an estimated £7.87m last year on MSC labelled fish oil and supplements, a 12 per cent increase on the previous year, and the most ever in the UK and Ireland, according to the MSC figures.

There are over 50 MSC labelled fish and krill oil supplement products for consumers in the UK and Ireland to choose from, nearly double the number that were available six years ago.

The demand for fish oils, set to grow by six per cent globally by 2026, will increase pressure on fish stocks, especially small pelagic fish stocks, 46 per cent of which are already currently overfished. However, the growth in the number of consumers buying fish oil coming from sustainable fisheries is helping to turn the tide by, in part driving a rapid growth in sustainable small pelagic and reduction fisheries.



Seth McCurry,
Senior Commercial
Manager at the

Marine Stewardship Council, commented: "It's brilliant to see this increase in the number of sustainable supplements being made available to and purchased by UK consumers, proving that those wanting to improve their own health also care about safeguarding the health of our oceans. MSC certified fish oils and other supplement products are sourced from sustainable fisheries that follow strict criteria related to stock management and the marine environment. We hope to see this rise in availability of certified products continue, ensuring there are sustainable sources of omega 3s for generations to come."

Paul Farquhar, Managing Director of supplement brand, Wiley's Finest UK, which is a long-time seller of MSC labelled fish oils, added: "Since our brand was created 10 years ago, we have adhered to strict conservation methods to sustainably source our Wild Alaskan Fish Oil. Back then, we were pioneering and so it's fulfilling to see consumers grow more mindful of where their supplements are sourced. High-quality, single species fish oils are better for human health, as well as the health of our oceans."

Maternal DHA benefits researched

A new study has found that docosahexaenoic acid (DHA) has the potential to influence maternal health.

Writing in the *Journal of Nutrition*, researchers explained that the objective of the analysis was to determine if DHA was related to maternal heart rate (HR) and heart rate variability (HRV) metrics in a large cohort of pregnant women.

In the parent trial, eligible participants (≥18 years old, English speaking, carrying a singleton pregnancy, between 12-20 weeks gestation), were randomly assigned to consume 200mg/day or 800mg/day of DHA for the duration of their pregnancy. Weight, blood pressure, and magnetocardiograms (MCG) were collected at 32 and 36 weeks' gestation. Measures of HR and HRV in time,

frequency, and nonlinear domains were determined from the isolated maternal MCG.

It was found that women receiving the higher dose of DHA (800mg/day) during pregnancy had lower HR, lower sympathetic index, higher vagally-mediated HRV indices, and greater HRV complexity when compared to the women who received the lower dose (200mg/day; all $p < 0.05$). All the dose relationships remained significant even after controlling for the effect of time, maternal weight, and dietary DHA intake. "DHA supplementation increases vagal tone in pregnant women. Longitudinal studies examining the potential link between DHA, enhanced vagal tone, and reported reduction in early preterm birth are warranted," they concluded.



New to market

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



MENOPAUSE FOCUS FOR MINERVA

A new supplement with a focus on the gut-hormone connection has been launched by Minerva Wellness.

With increasing scientific research on the link between gut health and hormonal balance, Minerva Wellness Co-Founders, Suzanne Boudier and Myriam Djellouli, spent the last two years developing a food-based supplement, together with nutritionists in Oxford, specifically to help reduce the severity of perimenopause and menopause symptoms by helping improve the environment of the gut microbiome.

The new probiotic supplement, Minerva Reset, was innovated with a unique formula of 20 clinically proven ingredients, including soy isoflavones and sage leaf, key vitamins including the B family, vitamin C and D3, plant botanicals including passionflower and bacopa monnieri, and zinc, chromium and magnesium trace minerals. All the ingredients are formulated with a five billion CFU live culture blend of four *Lactobacillus* and *Bifidobacterium* probiotics.

Packaged in 100 per cent recyclable amber glass jars, Minerva Reset supplements are vegan, gluten-free, non-GMO and contain no added preservatives or artificial colours.



Beauty support from Solaray

Supplement brand, Solaray, has unveiled a new range of nutritional support products for beauty.

Revealed as part of its brand refresh, the beauty category features four key products, Hair Skin & Nail, Vitamin B12 with Folic Acid, Selenium 100, and Timed-Release Biotin, with the category set to expand.

Designed to help people live brighter and support their health and life ambitions, Solaray's range of 90-plus products are sourced from the finest natural ingredients, harvested in an environmentally-friendly manner and rigorously tested for efficacy and purity.



Cura Sporebiotics launches

Cura Sporebiotics has been described as cutting edge probiotic spores, with high potency antioxidant formula.

While probiotics have been widely recognised as a solution to unhealthy gut problems, an increasing volume of research, suggests most of them are vulnerable to environmental conditions and cannot survive the high acidity levels of stomach acid – never reaching the gut. The people at Cura Nutrition, which is behind the product, explain that *Bacillus* spores do.

The spores in Cura Sporebiotics were isolated by Professor Simon Cutting and his research team at the Royal Holloway University of London. The result is a super optimised,

innovative, spore-based, gut-health product that is guaranteed to survive the digestive process, reach the gut and help its reconditioning.

The *bacillus* spores in Cura Sporebiotics undergo a stringent selection and DNA verification process. This guarantees precise strains that will survive and reach the gut, helping in its reconditioning by supporting the production of keystone bacteria.

Cura Nutrition's Sporebiotics also contains four highly absorbable carotenoids – beta-carotene, astaxanthin, lutein and lycopene – which together, deliver potent and comprehensive antioxidant support.



New herbal blend from Pukka

A seasonal-edition festive tea has been created by Pukka Herbs.

Winter Warmer is a 100 per cent organic, seasonal blend of the finest festive flavours to feel comfort and joy through the winter season.

This unique blend is the first Pukka tea to contain new ingredients, rooibos and lemon balm leaf. Rooibos, a popular South African herbal tea, is caffeine-free and well-known as a herb to make

you feel warm and cosy, while lemon balm leaf is an uplifting herb that can calm and enhance the mood, as well as encouraging clear thinking.

Naturally caffeine-free, ethically sourced, the other 100 per cent organically grown ingredients include orange peel, ginger, cinnamon, black peppercorn, star anise and clove.

VIRTUAL EDUCATION RETURNS IN NOVEMBER

Be sure to book your place at the final IHCAN Conference of the year.

The IHCAN Conferences series for 2022 ends with a bang this November as we welcome Dr Deanna Minich and Robyn Puglia. FdSc DiplON. mIFM. IFMCP to headline a virtual event.

Available to watch wherever you are in the world, you'll enjoy expert talks, a virtual expo with some of the industry's biggest brands, shorter break-out sessions and plenty of networking – all from the comfort of your own living room – or wherever you choose to join us from!



Eating the Rainbow: The Science and Clinical Application of Phytonutrients

Over the past decades, thousands of published studies have amassed supporting recommendations to consume fruits and vegetables for physiological and psychological health. Newer research has emerged to suggest that these plant-based foods contain a plethora of not only vitamins and minerals, but perhaps, most importantly, phytonutrients. Even though eating fruits and vegetables is a well-known feature of a healthy dietary pattern, population intakes continue to be below recommended levels. To encourage patients to include more fruits and vegetables into their diet and lifestyle, an 'eat by colour' approach is proposed in this presentation.

Dr Minich will discuss the importance of colourful,

plant-based foods to physical and mental health by explaining the nutritional content of a variety of colourful foods, as well as reviewing published research studies on this topic. The connection of healthy eating, reducing risk for chronic disease, and the food-mood relationship will be explored according to a 'colour code' (Minich, *Journal of Nutrition and Metabolism*, 2019). Practical strategies and practice for clinical implementation for personalising protocols to people's needs will be provided.

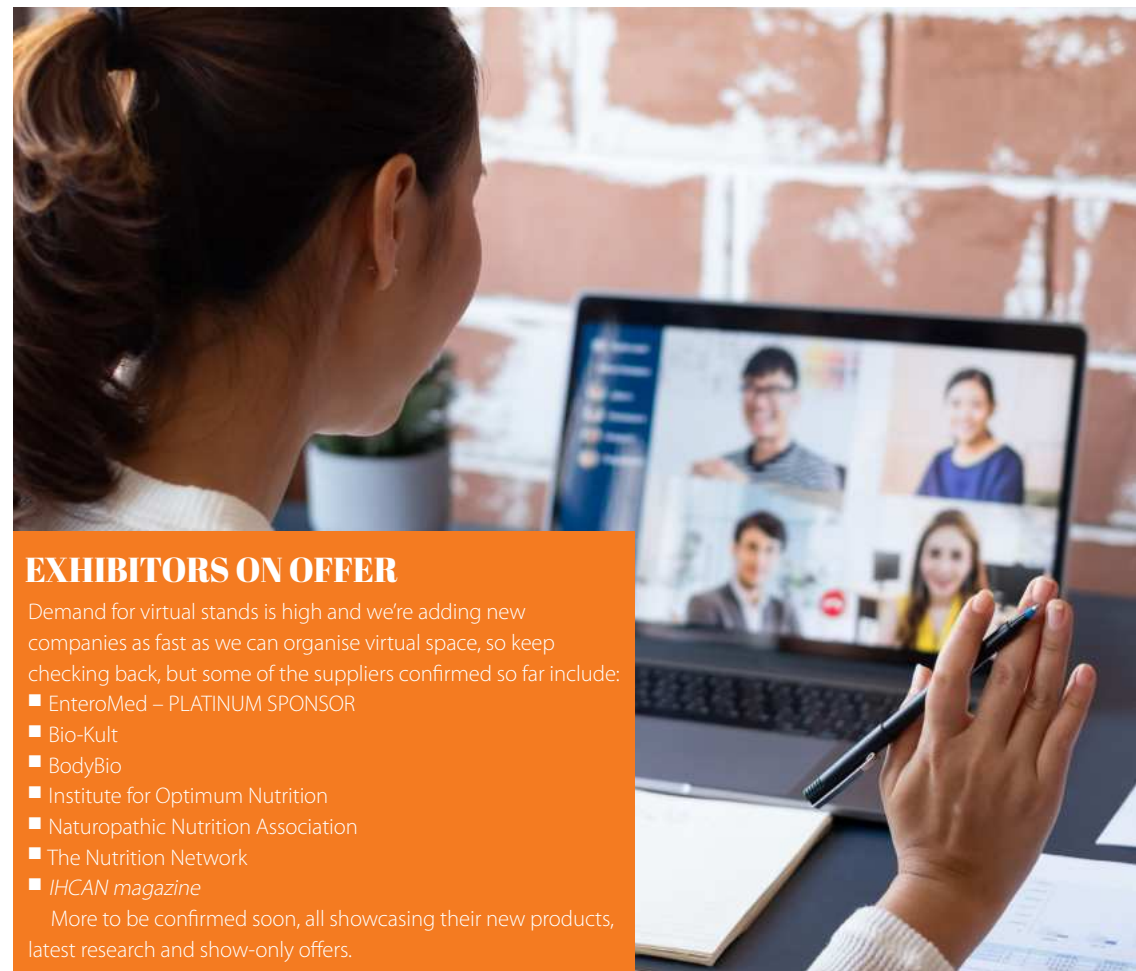
Dr Minich will be joined by Robyn Puglia. FdSc DiplON. mIFM. IFMCP, a Nutritional Therapist and IFM Certified Functional Medicine Practitioner.

Robyn and her team have a busy virtual clinic, specialising in autoimmune disease, gluten-reactive disorders including coeliac disease, complex cases and unexplained illness. As well as clinical practice, Robyn is co-founder and director of The Applied Functional Medicine Mentoring Program and has various education and practitioner support roles across the industry that keep her in touch with and supporting nutrition and FM practitioners.

Robyn was confirming her talk title as *Nutrition I-Mag* went to press, so look out for it at www.ihcanconferences.co.uk/november-2022 or across *Nutrition I-Mag's* social media.

To book your virtual ticket, visit www.ihcanconferences.co.uk/book – 10 per cent discounts are available for students and members of associations.

More to be confirmed soon, all showcasing their new products, latest research and show-only offers.



EXHIBITORS ON OFFER

Demand for virtual stands is high and we're adding new companies as fast as we can organise virtual space, so keep checking back, but some of the suppliers confirmed so far include:

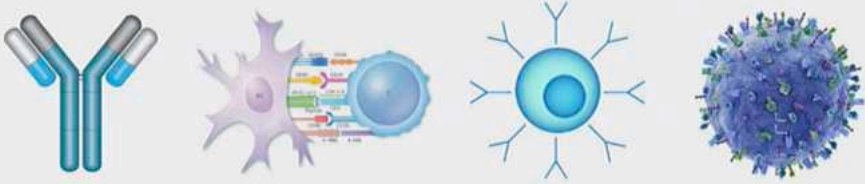
- EnteroMed – PLATINUM SPONSOR
- Bio-Kult
- BodyBio
- Institute for Optimum Nutrition
- Naturopathic Nutrition Association
- The Nutrition Network
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EXCLUSIVE TO *NUTRITION I-MAG* READERS

You can watch part one of Robyn Puglia's talk, *Understanding Autoimmunity: a journey through the labyrinth of a modern, complex illness*, when she last presented at the IHCAN Conferences back in 2018:




Understanding Autoimmunity.



A journey through the labyrinth of a modern, complex illness

Robyn Puglia
FdSc DipION IFMCP
mBANT mIFM CNHCreg

Robyn Puglia



The Immune System
Cavendish Conference Centre, London



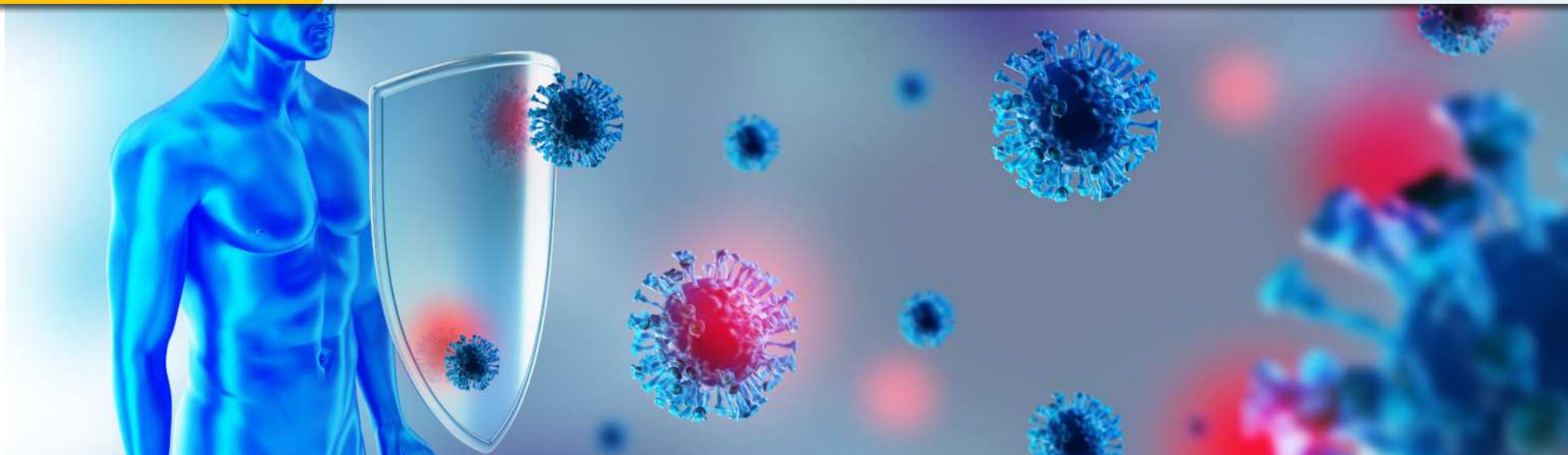
IMMUNE INTERVENTION

Autumn means immune health is often brought into sharper focus. And with Covid-19 still a factor in our lives, there is much to consider from a nutritional perspective.



Modern living is no friend to our immune systems, given that so many of the elements of such lifestyles can directly lower immunity. Whether it's our excess intake of caffeine processed food, and sugar, our stressful, often switched on lifestyles, or nutrient-depleted diets, these are all factors that cause our immune system to be lowered, leaving us unable to defend properly from bugs, not to mention the knock-on effect this has in a range of other health areas.

It is an area we need to focus on year-round, but autumn is traditionally a time when we place greater attention on it simply because there are more bugs doing the rounds. This has been even more pronounced in recent years with the arrival of Covid-19.



IMMUNE FACTORS

So, looking in greater detail, why does our immune system become lowered and what are the most common modern-day factors?

Claire Barnes, Technical Advisor at ADM Protexin, which has the Bio-Kult and Lepicol brands, explained: "There are numerous factors that can potentially lead to lowered immunity; such as lack of nutrition,¹ smoking,² mental health (e.g. stress and anxiety),³ over-exertion (particularly prolonged, high-intensity exercise),⁴ lack of exercise,⁵ metabolic conditions (such as obesity and type II diabetes),^{6,7} certain medications,⁸ previous infections¹ and lack of sleep⁹. All of these factors result in increased inflammation and oxidation in the body, requiring support from the immune system.¹⁰ Over time, this may lead to a dysfunctional immune response, lowering immunity from infection and reducing vaccine efficacy^{6,7}."

Rose Holmes, Registered Nutritionist, mBANT, BSc, Dip.ION, PGCE and Education and Training Manager at Rio Health, went on: "The immune system can be weakened by a number of factors, including diet, alcohol, smoking, insufficient sleep, psychological stress and exposure to infections. Some medications also may impact immunity. For example, steroids, used in asthma, suppress the immune system, as do chemotherapy drugs that target fast-replicating cells such as in bone marrow.

"Also, having some health conditions such as immunodeficiency disorders can lower immunity, for example, having the spleen removed

results in acquired immune deficiency and impacts immunity. Having an autoimmune disorder, such as coeliac disease or rheumatoid arthritis, can result in inappropriate immune responses and may impact immune response to infection (because, although in autoimmunity the immune system is relatively over-active, that doesn't necessarily make it better at fighting infection).

"And, having existing infections such as Lyme disease (a multi-factorial condition that often involves co-infections) or one of the herpes viruses (e.g. HSV1 that causes cold sores), which have periods of latency and of resurgence, may impact the body's ability to fight other infections. Stress (physical, nutritional, mental and/or emotional) is a very important trigger for these."

And what effect have the lockdowns had on immune health?

"Recent changes to everyday living conditions and psychological stress from global events over the recent lockdowns related to Covid-19 infections may have impacted immune system responses in many people. Stress affects body, behaviour and mood. Chronic stress means chronic higher levels of cortisol, and epinephrine (adrenaline) and at elevated levels, these can be immunosuppressive and may, both, increase inflammation and decrease immune response. So, if an individual was stressed by global events and personal living conditions/situations during the pandemic lockdowns, there may have been negative effects on that individual's immune health," Holmes advised.

"For some people, however, there may also have been changes that benefitted their immune health. For example, working from home (for some people) can mean less stress, once the new working pattern is established. And not being in close contact on crowded trains can mean less exposure to others coughing, sneezing, breathing their own mix of infectious micro-organisms (i.e. germs)."

Barnes continued: "The lockdowns could have increased many of the factors mentioned for some individuals and potentially increased their risk for lowered immunity. For example, during the lockdowns, there appeared to be an increased risk of developing and exacerbating mental health conditions, such as depression, anxiety and post-traumatic stress disorder, therefore, inducing a general inflammatory state, ultimately lowering immune response.¹¹ Additionally, the disruption to individuals' normal daily patterns, led to an increase in poor nutritional habits, often overeating or snacking, especially on foods rich in sugar and fats and ultra-processed foods.¹²

"Interestingly, teachers and their household members were found to be at lower risk of severe Covid-19 than similar working age adults.¹³ One explanation to this reduced risk of severe Covid-19 suggests that teachers might have more efficient immune responses after exposure to Covid-19 due to the presence of cross reactive T cells from increased previous exposures to viruses. This theory could suggest that through consciously avoiding exposure to viruses, as in lockdowns, we could potentially disrupt an efficient immune response to later infections."



THE HEALTH RISKS

Aside from the most obvious effect of lowered immunity being that you are more susceptible to illness, there are other health issues that are linked to poor immune status.

Barnes advised: "Low immune function could potentially lead to autoimmunity conditions, as there is an increased susceptibility to potential pathogens in the gut, such as bacteria and their components.¹⁵ These pathogens may disrupt the host defence system, such as the mucosal barrier function and gut microbial balance. These disturbances may initiate a number of chronic health problems, which could eventually evolve into an autoimmune disorder.¹⁵

"A further serious consequence of lowered immune function is an increased risk of developing cancers.¹⁴ We require the innate immune system to remain constantly vigilant not only against foreign pathogens but also to spot mutated cells that are constantly being produced by the body and if left unchecked, can become cancerous. These cells must then be destroyed appropriately by the acquired immune system and immunological memory developed.¹⁶ When the immune system is compromised, this vital function of immuno-editing becomes less efficient."

And Holmes went on: "An obvious sign we have lowered immunity is getting frequent colds or taking longer to recover from colds, or from healing of wounds. Another relatively obvious sign is the reactivation of latent viruses such as herpes viruses; for those who get cold sores, having an outbreak can be an indication that the immune system is being challenged or its response is lowered. Other symptoms of lowered immunity are more general and can be symptoms of a number of different health conditions. Fatigue and digestive issues (diarrhoea, constipation, bloating, gas, cramping), for example, often occur when the immune system is lowered.

"When we have lowered immunity, we may be more susceptible to more serious infections. Pneumonia, bronchitis, meningitis, and the recurrence of latent viral infection (such as cold sores, or shingles) are more common in those with lowered immunity. Anything that causes high levels of stress can also make us more susceptible to lowered immunity. This is because stress lowers lymphocyte levels, so it is more difficult for the body to fight infections."

Nutrition expert and author, Patrick Holford, also advised: "There are many signs that someone's immune system is not up to scratch, including if they

are more prone to catching a cold, find it hard to shift an infection, do they suffer from hay fever or have an allergy problem.

"A weakened immune system can lead to diseases including cancer, the flu and chronic fatigue syndrome. An overactive immune system can lead to auto immune diseases including multiple sclerosis (MS), Huntingdon's disease and lupus. Allergies occur when your immune system mistakes harmless substances for threats and attacks these harmless substances. It is important to keep the immune system in balance and at peace. It is only when the immune system goes wrong and does not recognise itself any more that auto-immune diseases occur."





PREP THE IMMUNE SYSTEM

At this time of year, it's important to have a focus on the immune system and address factors that could be lowering it. This is important ahead of the most common months when colds and other bugs are thriving.

Barnes explained: "Many people believe acute viral respiratory infections to be the result of a chill and the onset of a respiratory infection is often associated with acute cooling of the body surface, especially as the result of cold weather combined with wet clothes and hair. However, experiments involving inoculation of common cold viruses into the nose and periods of cold exposure, have failed to demonstrate any effect of cold exposure on susceptibility to infection with common cold viruses.¹⁷ Although some hypothesise that cold weather may cause reflex vasoconstriction in the nose and upper airways, which may inhibit respiratory defences and cause the onset of symptoms.¹⁷

"Other common theories include rhinoviruses (which account for more than three quarters of viruses circulating in early autumn),¹⁸ perhaps being best suited to the cooler weather, low levels of vitamin D seen in the population during the winter months, dryer indoor climate and more time spent indoors in proximity to others, allowing for easier disease transmission.

"Ideally, we should be taking steps to support the immune system throughout the year, opposed to waiting until the first signs of infection. As we cannot synthesise vitamin D from the sun's rays from October-April in the UK, making sure stores are adequately topped up during the summer and autumn is important. It may also be wise to have levels tested heading into winter to check whether additional supplementation is required. It's also a good idea to work on encouraging a healthy microbial balance in the gut to support immune responses, as depending on the level of dysbiosis and immune dysregulation, this may take some time to address."

Holmes recommended: "During the colder months, the body has less exposure to vitamin-D producing sunshine. Vitamin D levels importantly impact immunity. People in the northern hemisphere generally need vitamin D supplementation from November through March. Some people may benefit from supplementation year-round, especially those who get little direct sun exposure, and those with darker skin."





NUTRITIONAL PROTOCOLS

When it comes to the generally accepted nutritional advice, there are some key components to keep in mind.

"Nutrition is a critical determinant of immune responses and malnutrition is the most common cause of immunodeficiency worldwide.¹⁹ Low protein intake, in particular, is associated with a significant impairment of many immune cells and functions,¹⁹ so ensuring adequate intake from good quality sources such as organic grass-fed meat, wild fish, eggs, beans, legumes, nuts and seeds is therefore important. Consuming a wholefood diet high in a variety of colourful fruit and vegetables will help to increase antioxidants and anti-inflammatories to naturally support the immune system and negate some of the factors that can lead to a lowered immune system," Barnes advised.

"There are also certain foods known to have a beneficial effect on immunity, for example, traditionally fermented foods such as sauerkraut,

kimchi, kefir, kombucha, miso and live yoghurt may help address dysbiosis in the gut,²⁰ where over 70 per cent of immune cells reside.²¹ Studies also show that garlic (*Allium sativum*) appears to enhance the functioning of the immune system by stimulating certain cell types, such as macrophages, lymphocytes, natural killer (NK) cells, dendritic cells, and eosinophils.²² Green tea (*Camellia sinensis*), ginger (*Zingiber officinale*) and black cumin (*Nigella sativa*) also appear to have immuno-modulatory potential via various modes of action.²³ Dietary fibre, which is fermented by the gut microbiota into short-chain fatty acids, has also been shown to produce anti-inflammatory effects, further supporting immune function¹."

Penny King, speaking on behalf of Bio Pathica, which has the Immuno-Care plant sterol and antioxidant supplement in its portfolio, added: "A healthy and varied diet is the best way to maintain a strong immune system, but our busy lives can make it hard to ensure we always have the time to eat well so

that our nutritional needs are met on a daily basis. So many people now talk about 'boosting' the immune system as a way to minimise or prevent illness, particularly as we approach the winter months. However, research shows that the best approach is not to boost but to 'regulate' your immune system so that it can better respond to various conditions and help keep you well.

"Plant sterols, which are found in fresh fruit and vegetables, have the capacity to balance the immune system by helping to reduce inflammation and protect against bacterial and even viral infections."

Meanwhile, Holford went on: "The immune power diet should have two servings of beans, lentils, quinoa, tofu, or 'seed' vegetables a day for protein or one serving of fish or free-range chicken. Include both grains and beans/ lentils in your daily diet to increase protein quality if you are vegetarian. Eat plenty of complex carbohydrates such as brown rice, millet, rye, oats, wholewheat, corn and quinoa as cereal, breads or pasta. Avoid any form of sugar, and white, refined or processed food.

"Have five servings of fresh fruit and vegetables each day such as apples, pears, bananas, berries, melon or citrus fruit, and a mixture of dark green, leafy and root vegetables, such as watercress, carrots, sweet potatoes, broccoli, spinach green beans, peas and peppers. Eat at least one heaped tablespoon of ground seeds or one tablespoon of cold pressed seed oil a day. Avoid fried, burned or browned food, hydrogenated fat and excess animal fat. Eat whole, organics, raw food as much as you can and drink about six glasses of water, diluted juices, herbs or fruit teas each day."

And Holmes advised: "The best overall approach to support immunity involves providing the body with the nutrients and conditions it needs to be healthy; this can help prevent reduced immunity in the first instance. In addition to regular gentle exercise, sufficient sleep (which provides time for healing, when protective cytokines are produced), an effective means for dealing with life stressors (for example, yoga, meditation, laughter) and good personal hygiene, the foods we provide as nourishment are important.

"Include vitamin C-rich citrus fruits and peppers, leafy greens, fibre-rich foods, probiotic foods (yoghurt, kefir, kombucha), and prebiotic foods (onions, garlic, leeks). Many culinary herbs and spices also support immune health, for example, garlic, turmeric, ginger."

FOCUS ON NUTRIENTS

When it comes to the key nutrients that we need to support immunity, there are a range to take into consideration, especially if clients are at risk of deficiency.

"For immune support, I highly recommend providing supplemental vitamin D (especially during November through March in the northern hemisphere) and vitamin C year-round," Holmes suggested, adding: "Additionally, botanicals such as ginger, garlic and turmeric may benefit in a number of ways, including supporting immune health. Ashwagandha, echinacea, and sambucus are other useful botanicals to support immune health. And, since stress is an important contributory factor that impacts immunity, supporting health with an adaptogenic herb such as *Rhodiola rosea* can be beneficial.

"Ensuring magnesium levels is important for the immune system and many people have deficiency signs (fatigue, muscle spasms, sleepiness) and/or habitually low intakes or excessive loss of magnesium (e.g. due to use of certain medications or chronic alcoholism) or are in groups at high risk of magnesium insufficiency (e.g. those with gastrointestinal diseases, type 2 diabetes, older individuals). Magnesium impacts the efficiency of white blood cells, which are needed to fight infection."

Barnes added: "Deficiency of single nutrients also results in altered immune responses and this is observed even when the deficiency state is relatively mild.¹⁹ Of the micronutrients, zinc, selenium, iron, copper, vitamins A, C, D, E, B6 and folate have important influences on immune responses.^{1,19} As mentioned, nutrients with high anti-inflammatory and antioxidant capacity are important for immune function, such as vitamin C, vitamin E and phytochemicals such as carotenoids and polyphenols.¹ Vitamin D appears to be an important immune modulator associated with a better response to infections and is used to support autoimmune conditions.²⁴ Unfortunately, it is found in only a few foods, so deficiency is quite common.

"Zinc also affects cells involved in both innate and adaptive immunity at the survival, proliferation and maturation levels.²⁷ While acute zinc deficiency causes a decrease in innate and adaptive immunity, chronic deficiency increases inflammation.²⁷ Supplementation may therefore be beneficial for immuno-deficient individuals. Medicinal mushrooms also appear to enhance innate and acquired disease resistance. The major immuno-modulating

effects include mitogenicity and activation of immune effector cells²⁸."

And Holford advised: "Vitamin A is a powerful anti-viral vitamin, vitamin C is also anti-viral but also helps with the production of prostaglandins in blood platelets which in turn increase T cell production. Vitamin D is vital for strong immunity and vitamin E is necessary for a normal antibody response. They can commonly be lacking. A good all-round multivitamin and mineral, vitamin C, an antioxidant complex will give you a good level of nutrients to help boost your immune system. Your needs may be different when you have an infection, at this time you may need an extra boost of antioxidants and vitamin C."

You could also consider probiotics, given the link with immunity and the gut.

"Live bacteria supplements have been shown to directly and indirectly affect both the innate and acquired immune system.²⁵ As different bacterial strains have individual beneficial effects and work in different areas of the gut, multi-strain live bacteria products may help support the immune system in a variety of ways. Certain strains such as *Bacillus Subtilis* PXN 21 has been shown to be particularly effective at stimulating the innate immune system²⁶," Barnes explained.





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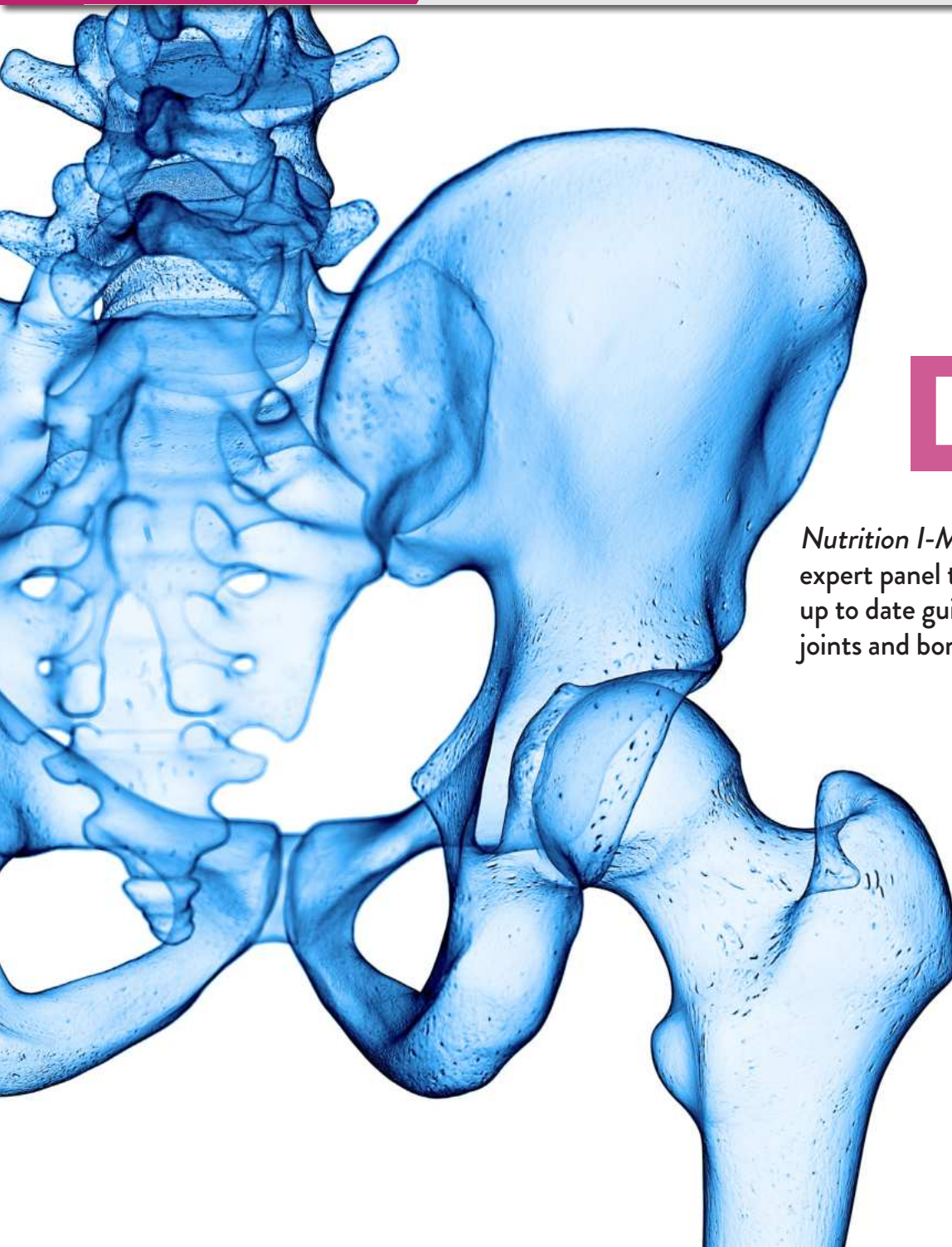


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JOINT AND BONE PROTOCOLS

Nutrition I-Mag gathers an expert panel to discuss the most up to date guidance to support joints and bones.

Our musculoskeletal system is a complex combination of bones, cartilage, ligaments, tendons and connective tissues. Whether through ageing, overuse, or injury, these can all be affected in a range of ways, with cases of arthritis alone known to be on the rise in the UK.

Maintaining the health of our joints and bones involves a wide range of factors, with nutrition being one of the crucial considerations to make.

Alice Bradshaw, Head of Nutrition Education and Information at Terranova Nutrition, commented: "Millions of individuals in the UK live with conditions affecting their bones and/or joints, either because of degenerative joint disease or sports injuries and 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. There are a range of joint/bone related issues that can affect an individual, ranging from inflammation, pain and stiffness, sports injuries and age-related degeneration. Autoimmune conditions or genetic influences can also be contributing factors."

Lindsay Powers, Nutritional Therapist and Health Coach Manager at Good Health Naturally, added: "The most common joint-related problems tend to relate to inflammatory joint conditions such as osteoarthritis and rheumatoid arthritis. Whilst osteoarthritis relates more to the 'wear and tear' of joint tissue, RA is an autoimmune-related condition. However, they are both characteristic of severe joint pain and inflammation, resulting in subsequent damage and degeneration of the connective tissue."

"According to the NHS, joint-related issues affect large numbers of the



SEDENTARY CAUSES

population, with around 10 million people in the UK having arthritis or similar joint-related problems. Ongoing joint-related issues can begin as early as the mid-40s, but more severe cases of arthritis tend to affect older people from the mid-60s upwards. Some problems can affect children, as in the case of juvenile arthritis. Injuries or problems such as gout or autoimmune conditions can affect any age group and create ongoing issues with joint health.

"According to Age UK, over three million people in the UK are estimated to have osteoporosis, which is the most common form of bone disease. However, it is often referred to as the 'silent disease' as many people are unaware they have it until they break a bone, and there are more than 300,000 fractures each year due to osteoporosis."

Dr Katarzyna Maresz holds a PhD in Biological Sciences and is currently President of the International Science and Health Foundation and the scientific coordinator of the educational portal VitaminK2.org. She added: "Maintaining one's mobility is paramount for those seeking to age healthily. Yet compromised bone health impacts most middle-aged adults worldwide, with osteoporosis causing millions of fractures annually. Further, a systematic analysis published in the *Annals of Rheumatic Diseases* shows an increase in global age-standardized prevalence and incidence rates of rheumatoid arthritis (RA)[1], and the prevalence of knee osteoarthritis has doubled since the mid-20th century.[2]"

And Amy Rushton, from Lamberts, continued: "Osteoarthritis is a common condition that affects the joints. It is characterised by stiffness and inflammation and can result in a lack of mobility. Osteoarthritis occurs when the cartilage between the bones is worn away, which can then cause two bones to rub together. There are several factors that can increase the risk of developing osteoarthritis, which include obesity, repetitive stress and joint injuries. Osteoarthritis is increasing in prevalence across the world, which can largely be attributed to the rise in obesity.

"Osteoporosis is a condition that causes the bone to become weak which can increase the risk of fractures and breakages. Typically, individuals start by developing osteopenia, which can then lead to osteoporosis. Diet can play a major role in maintaining bone health. Vitamin D, calcium and vitamin K2 are all important nutrients to ensure the maintenance of normal bone health. Low intakes of these nutrients, especially during teenage years, can result in reduced bone mineral density, which can increase the risk of developing osteoporosis later in life. The rates of osteoporosis have risen, which may be a result of the increased obesity rates, reduced intake of the key nutrients mentioned above and excessive alcohol consumption."

We also know that poor lifestyle choices, and particularly being sedentary, can exacerbate joint problems.

"Regular exercise is necessary for optimal joint and bone health. This does not need to be strenuous so even walking, jogging and light weight-bearing exercise, when undertaken on a regular basis, will be helpful," Bradshaw advised. "Bones need weight bearing activity to be able to properly deposit minerals within their matrix as well as maintain proper strength. Joints benefit from movement and exercise may help to modulate inflammation and maintain flexibility."

And when it comes to our bone health, she added: "Bone health relies on a wide range of factors – some nutritional and some lifestyle. Bone density can decline (especially with age) and is influenced by hereditary factors, hormonal health, exercise, smoking, some medications and diet. The health of the bones tends to deteriorate as we age. They may become porous and more prone to fractures, and this is especially problematic for post-menopausal women, (although men do suffer too).

"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."

Rushton continued: "A sedentary lifestyle has a large impact on the long-term health of both the joints and the bones. Weight bearing activities are very important for bone health as this type of activity can improve bone mineral density as muscle contraction can apply pressure to the bones, stimulating the production of bone tissue and therefore reducing the risk of developing osteoporosis. By living a sedentary lifestyle, weight bearing activities are avoided which puts people at an increased risk of osteoporosis.



"A sedentary lifestyle is associated with increased inflammation, which may exacerbate conditions such as rheumatoid arthritis. Furthermore, a sedentary lifestyle can result in uneven wear and tear of the joints, increasing the risk of developing arthritis. Individuals who lead a sedentary lifestyle also tend to carry more weight, resulting in additional stress on joints."

Powers also commented: "Inactivity and a lack of weight-bearing exercise can impact joint and bone health. Studies show that weight-bearing exercise can help to slow bone loss and even build bone. Activities that put pressure on the bones can stimulate calcium deposits and encourage the action of bone-forming cells. Inactivity can also cause muscles to be weak. This can potentially increase the risk of trips and falls and, consequently, bone fractures or tendon or joint injuries. Therefore, it is essential to have daily exercise, such as walking and running, to put as much impact on the bones as possible."



FOCUS ON VITAMIN K

We are seeing increasing research confirming the crucial role vitamin K plays in our joint and bone health.

Dr Maresz explained: "A substantial body of evidence shows that a fat-soluble vitamin – vitamin K2 – is an essential calcium companion. Vitamin K2 ensures peak calcium utilisation for the skeleton and the highest possible protection from calcium accumulation in arterial walls. At the same time, low vitamin K status has been associated with joint problems.[3] Evidence is increasing, demonstrating that K2 has excellent potential for impacting joint health through its bone support mechanism and anti-inflammatory action.

"Evidence has linked one's K2 status – in both adult and child populations – to the state of bone health, and joint health is a burgeoning new area that researchers continue to explore. Because of its high bioavailability and significant impact on osteocalcin activation, vitamin K2 as MK-7 remains the optimal choice."

In terms of the mechanism of action, Dr Maresz went on: "Vitamin K2 activates osteocalcin (OC), a vitamin K-dependent protein (VKDP) synthesised by osteoblasts and has been demonstrated to be related to bone mineralisation. Vitamin K, particularly K2, may also decrease bone resorption by reducing prostaglandin E2 synthesis in osteoclasts (cells responsible for the dissolution and absorption of bone) [4].

"In addition to OC carboxylation, which modulates calcium deposition in bone, vitamin K2 increases collagen synthesis and accumulation [5] and production by osteoblasts [6]. Collagen is essential for bone flexibility and elasticity, occupying more than half the volume of bones. It is responsible for matrix production, the material on which calcium and other minerals accumulate. Therefore, collagen accumulation and bone minerals are critical for high-quality bone formation.

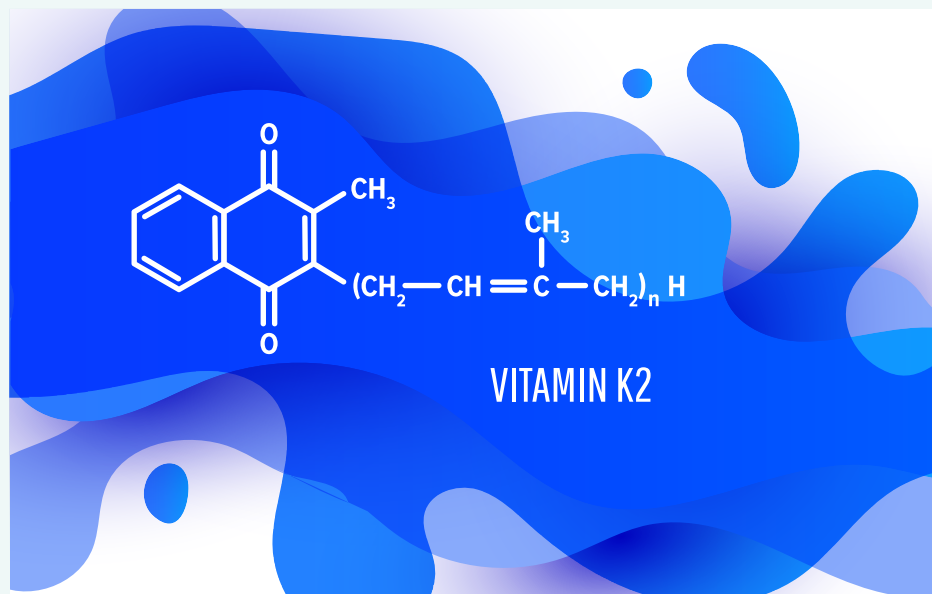
"Other than OC, many VKDPs, such as matrix Gla

protein (MGP), protein S, and periostin, are produced in the bone matrix, suggesting a complex involvement of vitamin K and VKDPs in bone health. Further, through its anti-inflammatory action and activation of VKDPs, K2 may contribute to decreased articular cartilage calcification, joint pain, and inflammation [7]."

And looking in greater detail at low vitamin K and its link to bone health, Dr Maresz advised: "Low vitamin K status correlates with poor bone quality and increased osteoporosis and bone fracture risk [8-10]. The incidence of forearm fractures in children peaks around the pubertal growth spurt, possibly because physical activity increases while there is less cortical bone mass due to the increased calcium demand during skeletal growth. A population-based study in Minnesota examined whether there has been a change in the incidence of forearm fractures in children over 30 years. The results showed that annual incidence rates of forearm fractures per 100,000 increased from 263.3 in

1969-1971 to 322.3 in 1979-1981, and to 399.8 in 1989-1991 before leveling off at 372.9 in 1999-2001, which may be linked to vitamin K intake decrease in children on Western diets [11].

"The Hungarian study evaluated 10-12 year old children (N = 123, 59 girls, 64 boys) according to physical activity, diet, anthropometric, and bone data. The study showed that changes in the characteristics of ultrasound bone parameters among 10-12 years old children mainly depended on the amount of intense physical activity, adequate vitamin K intake, and anthropometric variables related to age [12]. Understanding the combined approach to a healthy skeletal system in children and young adults, including the roles of vitamins D and K, particularly vitamin K2 as menaquinone-7 (MK-7), calcium, healthy diet, and exercise, is essential given reports of subclinical insufficiency of vitamins D and K in otherwise healthy paediatric populations with low-energy bone fractures [13]."



PREVENTATIVE MEASURES

It's important to question if there is anything that should be recommended from a preventative perspective, looking at diet and with a focus on nutrients, to reduce the risk of joint and bone health.

"Try to maintain a healthy weight, as excess weight can stress the joints, especially the knees, and worsen arthritis symptoms and tissue damage. Aim to follow a healthy plant-based diet with lots of healthy fats, legumes, and brightly coloured fruits and vegetables. If you eat meat and fish, keep red meat to a minimum and choose oily fish for its anti-inflammatory omega 3 fatty acids. Clear all sugars, refined carbohydrates and ultra-processed foods from the diet as they can be pro-inflammatory," Powers advised.

"Try to keep alcohol consumption within healthy recommended ranges. Alcohol may increase inflammation in the body, and some research suggests that alcohol may worsen joint pain. If you smoke, seek advice to help you quit, as smoking may also contribute to the joint pain associated with arthritis."

Bradshaw added: "Nutrition plays a significant role in both bone and joint health. Foods tend to either encourage or dampen inflammation. A diet high in pro-inflammatory foods such as refined carbohydrates, excess sugar, poor quality oils and processed foods will exacerbate any joint-related health issues, whereas omega 3 fats (from oily fish or flaxseeds) and a diet which is rich in natural wholefoods will support healthy joints. Bone health depends on much more than just calcium. Adequate protein and numerous other nutrients such as vitamin D3, K2, magnesium, boron and zinc all play crucial roles in preventing problems with bones."

And if we look at the key dietary factors to include here, Keri Briggs, Technical Advice Manager at Lamberts, suggested: "There are many nutrients which are considered to have either a direct or indirect impact on bone health. Calcium is well-known for contributing to normal bone health but nutrients such as magnesium and vitamins D3 and K2 are also highly significant and are often more likely to be low in UK diets. For example, NDNS data indicates



that up to 70 per cent of women do not meet their daily requirement for magnesium. Consuming a varied diet which includes green leafy vegetables, wholegrain cereals, nuts and seeds and fermented foods will all contribute to good bone health by providing these vitamins and minerals.

"Joint health can also be affected by the diet and it is important to consume plenty of vitamin C as this can contribute to collagen production, which can then be useful for supporting cartilage. Choosing dark red, purple and blue fruits will also supply anthocyanidins, which may also support collagen. Eating oily fish such as mackerel, herrings, sardines and salmon and adding spices such as turmeric and ginger to the diet may affect the production of compounds such as prostaglandins, which regulate and control inflammation. It is only when inflammation is chronic or out of control that significant issues with the joints and general health will occur."

And Lucy Kershaw, Nutrition Advice Specialist at Lamberts, continued: "Joint and bone health issues may occur depending on what type of diet you follow. For example, if you follow a vegan diet, it may lack in calcium, which is very important for bone health. It also may lack in omega 3s from oily fish, similarly to a vegetarian diet. The omega 3s are useful in helping to reduce inflammation in the body, which may be useful for different joint health issues. Those who eat little oily fish may have issues with inflammation and joint health. It may be easier to consume the omega 3s through a supplement.

"Those who avoid dairy may need to consider choosing alternatives carefully, ensuring they are fortified with calcium and vitamin D for bone health. Processed foods are often low in fruit, vegetables and fibre. Fruit and vegetables contain important nutrients such as magnesium, which help to ensure calcium is deposited in the bone, helping to improve bone mineral density. Therefore, diets high in processed foods can lead to bone health problems."

And Bradshaw suggested: "Adopting an anti-inflammatory diet will go a long way to ease symptoms of joint discomfort



in many cases. Specifically, adding foods such as ginger, turmeric, walnuts, olive oil, berries, oily fish or flaxseeds and plenty of vegetables would be recommendations backed by most nutritional experts. A health practitioner may also help clients to discover if there are any foods that they are personally reacting to which may be contributing to joint issues. Removing these can sometimes bring remarkably quick relief where there is pain and inflammation."

And looking in greater detail at bone health, she added: "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 that a diet that is high in animal protein results in an acidic body chemistry, which caused the body to attempt to buffer the acidity by withdrawing alkaline minerals (i.e. calcium), from bone. A slightly alkaline body chemistry is needed for good bone health and studies show that excessive daily protein can significantly increase the excretion of calcium in the urine.

"Refined sugar also promotes acidic body chemistry, so is best limited. Sweet, carbonated drinks, whether they are sugar-free or not, also need to be avoided as their high level of phosphates encourages calcium depletion from the bones. One of the most important dietary components 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 Powers added: "In terms of nutrition, calcium is a well-known nutrient for bone health. Generally, we get plenty of calcium through our diets, with calcium-rich food including green leafy veg, cheese, tofu, sesame seeds and tahini, and fish such as sardines where you eat the bones.

"Vitamin D, primarily from sunlight, is another critical bone health nutrient, so aim to get out in the midday sun during the summer months to top up your levels. It may also be essential to consider a vitamin D3 supplement. It is not always possible to get a sufficient intake from sunlight and food, and many of us are considerably low in vitamin D levels."



PRACTITIONER TOOLKIT

There are a range of nutrients that should be recommended in relation to joint and bone health, some more preventative measures and others to address pain and inflammation.

Briggs advised: "Vitamin D3 can be difficult to obtain even from a varied diet unless oily fish or heavily fortified foods are consumed on a daily basis. Our main source is exposure of the skin to sunlight, but during the winter or for individuals with darker skin or those who do not go out in the sun, supplementation will be useful. It should also be considered for the elderly who have a decreased ability to make vitamin D in the skin [i] and a decrease in the ability of the kidneys to convert dietary vitamin D to the active form [ii] and for those who are overweight who are more often low in circulating vitamin D.

"Most people in the UK do not consume sufficient levels of oily fish and will therefore struggle to obtain relevant levels of the omega 3 fatty acids, EPA and DHA. Whilst there are vegetarian sources of omega 3, this is often found as the parent compound of this fatty acid group known as ALA. The conversion of ALA is relatively inefficient – around only six per cent will convert to EPA and three per cent to DHA [iii] and this may be further decreased by high omega 6 intake, which is often found in processed foods and vegetable and seed oils. Therefore, a supplement of fish oil or a vegan alternative sourced from algae may be useful."

And Powers recommended: "Vitamin C is an essential nutrient for collagen synthesis and necessary for healthy connective tissue in the musculoskeletal system. We can get a good intake from fruits and vegetables, or to support a good daily intake, a supplement can be taken. You can also take collagen supplements containing Type 11 collagen peptides which are the most abundant in joint tissue.

"Curcumin, the active component of the turmeric root, has been extensively researched for its anti-inflammatory properties and benefits for arthritic conditions. Serrapeptase 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."

Bradshaw went on: "There are many supplements that have been shown to mediate inflammatory responses. These include vitamin D, omega 3 essential fatty acids, quercetin, boswellia, MSM, ginger, turmeric, tart cherry and many others. Many nutritional supplements combine two or more of these so it's not always necessary to take multiple individual supplements. 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.

"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."

If we looked in further detail at bone health supplements, Bradshaw suggested: "Many people associate calcium with bone health and while that is correct, there are many other nutrients that play an equal or possibly more important role. 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. Magnesium has a synergistic relationship with calcium and is involved in bone formation and the strengthening of bones. Magnesium also helps with the absorption of calcium into the bones. 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."



LIFESTYLE RECOMMENDATIONS

Addressing some of the sedentary factors is really important to support nutritional changes.

“One of the main lifestyle changes that can be made is to exercise – although it is important to choose the type of exercise carefully and vary your regime as much as possible for the maximum benefits,” Briggs advised. “Weight bearing exercise has long been known to help to accumulate and maintain bone density, due to the impact on the bones. However, this may add to wear and tear and damage to the joints and those who already have joint issues may find it difficult to take part in the activities which are often recommended for bone health. Strength, resistance and muscle building exercises which do not necessarily require someone to run or walk can also help to build and maintain bone density, as the muscles pull on the bones.

“For those with joint issues, more gentle exercises such as swimming, Pilates and yoga may be useful for maintaining and improving flexibility. These will also help with the preservation of skeletal muscle, reduce the risk of sarcopenia and yoga, in particular, will also count as resistance training. All these factors will also help bone health.

“One of the biggest impacts of increasing activity level or exercising more will be the effect on body weight and composition. Excess weight can not only put more strain on the joints but excess adipose tissue is also linked to an increase in inflammation [1]. Whilst it is recognised that you cannot outrun a bad diet and exercise makes only a minor contribution to overall weight loss, it does also affect body composition and the increase in lean muscle mass may also be beneficial for bone health, in particular.”

Powers went on: “We must remain active as our joints and bones respond well to activity. As our bones are constantly remodelling, exercise helps the bone-forming cells to be more active. Walking is an excellent weight-bearing exercise that helps maintain strong bones and strengthens the muscles to help improve overall balance and coordination and prevent falls and fractures. Try picking up the pace on your daily walk and aim for at least 30-60 minutes of brisk walking each day.

“Research shows that exercise can also help ease arthritic pain and joint stiffness. Regular exercise, such as walking and swimming, can increase joint flexibility and strength. Other options, such as Pilates and yoga, are great ways to exercise gently, helping to improve flexibility and ease tension whilst relieving arthritic pain.”





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The role of medicinal mushrooms

A practitioner guide to the best recommendations around medicinal mushrooms in clinic.





There has been a steady rise in availability of medicinal mushroom products in the UK, perhaps testament to the growing understanding among the general public of the benefits of such products.

But some of these products can be more targeted to a mainstream shopper, as opposed to the nutritional therapy client, and this can sometimes lead to lower quality, less efficacious products that aren't going to achieve the desired benefits.



So, as a practitioner, what do you need to know about medicinal mushrooms in terms of their range of functions, and, importantly, the considerations to make in terms of suitability for a client's needs?

Sophie Barrett, Medical Herbalist and Mycotherapy Adviser at Hifas da Terra, commented: "Different cultures around the world have incorporated medicinal mushrooms into their healing practices for centuries and modern-day scientific research supports this."

Alice Bradshaw, Nutritional Therapist and Head of Nutrition Education and Information at Terranova Nutrition, went on: "As more people are looking for natural solutions to health issues, the recognition of mushrooms has increased. The versatility of these supplements, coupled with the increasing amount of research, make mushrooms a popular addition to their diets. Mushrooms can be taken as capsules or added to coffee, smoothies and multiple other recipes. Many people do, however, choose supplements as they are easy and convenient and the daily dosage is already calculated."

A RANGE OF BENEFITS

If we look in further detail at the role of medicinal mushrooms and the benefits to be gained, there's a lot to consider in terms of the potential to your clients.

Let's first start with the consensus on what actually constitutes a medicinal mushroom.

"Medicinal mushrooms contain some of nature's most potent health-promoting compounds and as such, have been the subject of a huge amount of research into their potential benefits and protective properties," Bradshaw explained.

"Much of the research centres around the properties of compounds such as polysaccharides, triterpenes, lignins and phytosterols, which are found abundantly in mushrooms. These compounds are associated with a vast array of important health benefits, including enhancing immune function, reducing microbes, supporting respiratory health, adaptogenic potential and much more."

Barrett added: "Put simply, medicinal mushrooms are mushrooms that are used as medicine. They are macroscopic fungi (fungi that grows by producing mycelium below ground, differing from moulds because these macrofungi produce a visible fruiting body) that are used in the form of extracts, powders, or other mediums, such as tinctures for prevention, alleviation and healing of multiple health concerns, as well as balancing a healthy diet."

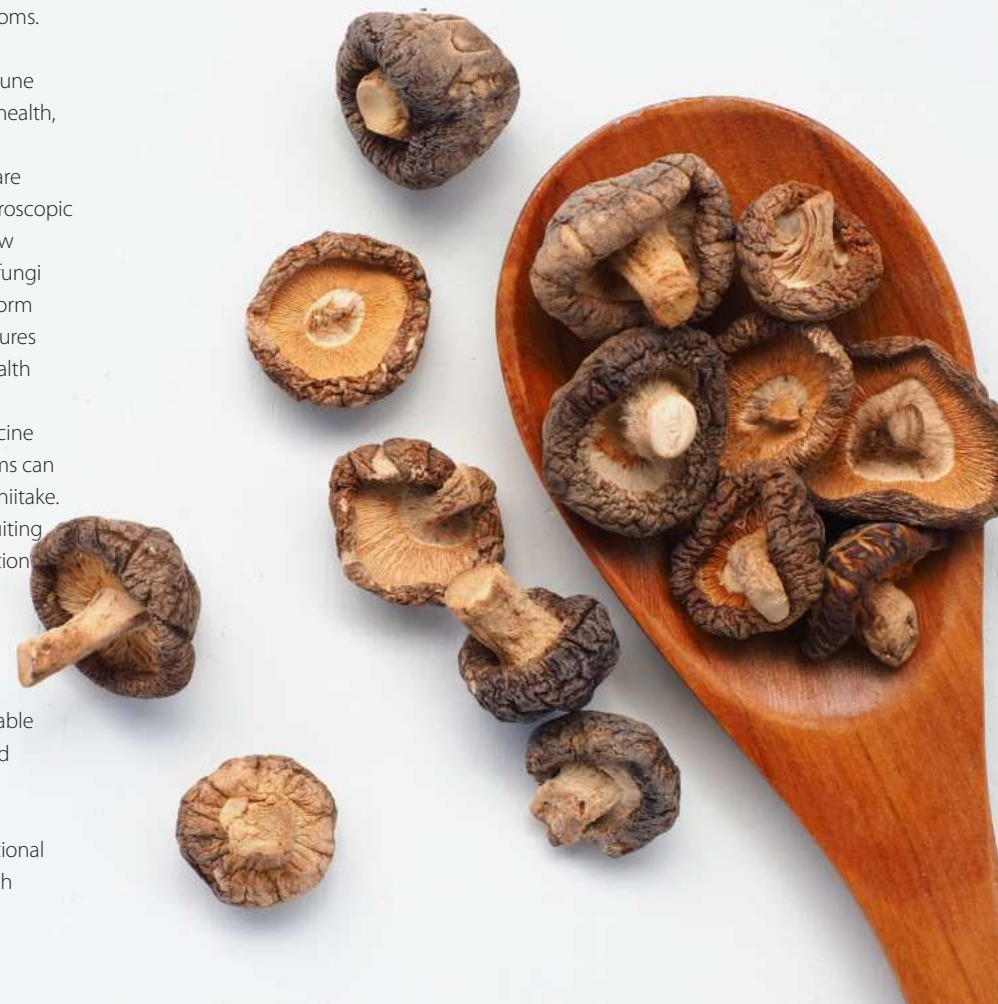
"They have been used in Traditional Chinese Medicine for over 2,000 years and specific medicinal mushrooms can be eaten as part of a healthy balanced diet, such as shiitake. Composed of three main parts, the mycelium, the fruiting body and the spores, there is research on a combination of these, but traditionally, fruiting body was used in Traditional Chinese Medicine and is most highly prized, expensive and time-consuming to grow this part of the mushroom and often the fruiting body is more concentrated in the most desirable compounds utilised for their immunomodulating and rejuvenating properties."

And what about the range of benefits?

Barrett explained: "Medicinal mushrooms are functional foods that can be used safely long-term, they are both

nutritive and therapeutic and therefore useful across a broad spectrum for prevention, active support, and maintenance of symptom reduction. They are important sources of bioactive compounds, a key one being beta-glucans that act as biological response modifiers, meaning they maintain homeostasis in the body and are classed as adaptogens.

"As a result of these properties, medicinal mushrooms promote health in several different ways and are a very bioavailable natural medicine, having anti-inflammatory, cardiovascular, anti-microbial and immune supporting benefits among others."





MUSHROOMS OF CHOICE

There are hundreds of mushrooms, but not all can be considered medicinal. So, what would the experts suggest you consider in terms of recommendations to your clients?

"The medicinal mushrooms I turn to time and again for myself and my clients (as a medical herbalist and naturopath) are reishi, lion's mane and cordyceps, but I also work regularly with turkey tail, shiitake, chaga, polyporus and Royal sun mushroom/AbM for their unique qualities and combined synergy in formulas," Barrett advised.

"Reishi (*Ganoderma lucidum*) is a great aid for improving cognitive function and the stress response. High in antioxidants containing key fungal nutrients with neurological effects – terpenoids increase neurogenesis and have antioxidant and anti-inflammatory actions. A powerful adaptogen, reishi is hormone modulating, cortisol regulating, immunomodulatory and has a calming, stress relieving anti-inflammatory effect.

"Lion's mane (*Hericium erinaceus*) is the medicinal mushroom to turn to for brain function, including memory, concentration, and gut healing. Studies demonstrate its ability to stimulate nerve growth factor (NGF) for nerve tissue regeneration and to support healing of the gut lining. It is a prebiotic and regulates microbiota, and because it supports gut health, it supports all conditions that have a gut-brain connection and is indicated in mood/stress related digestive complaints."

She went on: "Cordyceps (*Cordyceps sinensis*) is energising and mood boosting, as well as antiviral. It is also hormone modulating and supports the adrenals. Several scientific studies confirm its action to increase the use of oxygen and ATP production. Shiitake (*Lentinula edodes*) is good for the metabolism and reduces total cholesterol levels, while increasing HDL, therefore, improving the lipid profile while reducing risk of cardiovascular disease."

And Bradshaw went on: "There are various mushrooms that are researched for their medicinal properties. Some people may choose a combination product for general immune support or health enhancement. Each mushroom has its specific health benefits:

■ **REISHI:** Studies have analysed the bioactive compounds within reishi mushroom and have found over 400 compounds within the fruiting body, mycelia and spores. The primary active compounds include triterpenoids, polysaccharides,

nucleotides, sterols, steroids, fatty acids, proteins, trace mineral elements, vitamins and amino acids. The polysaccharides, Ganoderma A, B, C found in reishi have been shown in studies to have blood sugar regulating properties. Triterpenes are also present in reishi and ganoderic acid has been shown in studies to manage the symptoms of allergies by inhibiting the release of histamine.

■ **MAITAKE:** Numerous research studies have highlighted several significant health benefits associated with compounds in maitake mushroom. Like other medicinal mushrooms, maitake contains many potent elements and is especially rich in β -Glucans (beta-glucans), a group of β -D-glucose polysaccharides, which have been scientifically shown to support immune function. Maitake mushrooms are especially rich in the sulphur-containing antioxidant, ergothioneine. This unique compound, produced by fungi, has been shown to have strong antioxidant properties. There is also research to suggest that ergothioneine can support a healthy inflammatory response within the body, while also helping to normalise several markers related to cardiovascular health. Maitake is also considered an adaptogenic agent, helping the body to adapt to physical, emotional and environmental stressors.

■ **CHAGA:** Chaga has one of the highest ORAC (Oxygen Radical Absorbent Capacity) scores of any food. As such, their high antioxidant potential means they may effectively protect the body from harmful free radicals. The active constituents within chaga include a combination of triterpenes, such as betulinic acid, sterols, and polysaccharides. Chaga has been the subject of numerous scientific studies which support its actions as cell-protective and immune supportive, while also acting against viruses and enhancing endurance.

■ **CORDYCEPS:** Cordyceps mushrooms have long been esteemed for their potent health-promoting qualities. The studied health benefits of cordyceps include supporting immune health, slowing the ageing process, improving athletic performance, blood sugar regulation and supporting the cardiovascular system.

■ **SHIITAKE:** Cordyceps mushrooms have long been esteemed for their potent health-promoting qualities. The studied health benefits of cordyceps include supporting immune health, slowing the ageing process, improving athletic performance, blood sugar regulation and supporting the cardiovascular system."





CLIENT PROTOCOL

In terms of you as practitioners, what would the experts recommend in terms of how mushroom supplements are incorporated into a recommended protocol?

Barrett advised: "There are many different ways you can utilise medicinal mushroom supplements: they can be used alongside either nutritional and herbal medicine plans, for short-term addressing of a complaint for a minimum of 60 days or for long-term preventative or maintenance use.

"From a preventative perspective, to improve the gut microbiome, they are useful prebiotics – most commonly in their whole dried powder form – with antibacterial, antiviral, and antimicrobial properties. From an immunomodulating perspective, they can support many auto-immune conditions and mushrooms such as reishi are valuable anti-inflammatories, as well as hormone modulating so can be very useful for women's health, in particular, those experiencing perimenopause and menopause. Ideally, separate from other supplements or medications or meals by at least one hour."

Barrett also turned her attention to what the specific needs of the client are.

"Dependent on the concentration of the supplement or extract, the age of the client, and the condition, each dose should be tailored to the individual's needs. As mentioned, it is important to be constant and regular with the daily dose and there may be a need for a higher dose if the condition is chronic in adults where medicinal mushroom extracts are important for addressing active complaints for faster or more profound results," she explained.

"For children, it is important to use lower doses based on the body weight of the child. If there are any pre-existing mushroom allergies, then mushroom supplements should be avoided, and anyone breastfeeding or pregnant, we advise it is best to avoid any concentrated extracts and instead, stick to incorporating culinary mushrooms or mushroom superfood powders into an eating plan."

And, of course, quality is key, as is educating your client around

what to consider when choosing a mushroom supplement.

"Mushrooms have various stages of development and there is much debate as to which stage offers the most health benefits. It's best to look for products that harness all the health benefits naturally found within the whole organism. The biologically active compounds found with whole mushroom include the primordia, mycelium, fruiting bodies as well as extra-cellular compounds that are responsible for the known medicinal properties found in fungi," Bradshaw advised.

Barrett added: "The most important things to look out for when choosing a medicinal mushroom supplement is that it is certified organic, ideally 100 per cent organic mushroom fruiting body or grain-free mycelium in vegetable capsules and it is vital to know the quality and production processes are standardised and certified. Standardisation of specific individual active compounds, not just stating total polysaccharides as total glucans, is what is going to give people the benefits. There are many 100 per cent organic medicinal mushroom products on the market, but unless these products have standardised levels of terpenes or beta-glucans as with Hifas da Terra's products, people are not going to benefit from the desired effects.

"GMP (Good Manufacturing Practice) certification ensures that production is uniform and controlled, meeting pharmaceutical safety and quality standards. Third party controls such as these ensure that companies are living up to any claims they make. Look for products that are free from gluten, preservatives, chemical products, sweeteners, flavourings, starch, wheat, corn, nuts, soy, sugar, and dairy, as well as grain biomass."

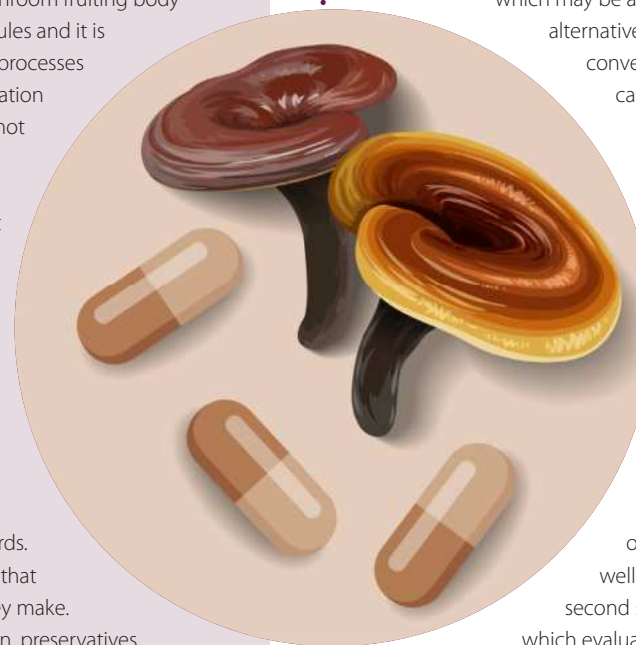
RESEARCH UPDATE

The beneficial effects of medicinal mushrooms in a range of health areas is an ongoing focus when it comes to research.

Barrett pointed out: "There is a lot of new research into medicinal mushrooms for their antiviral qualities, particularly since the Covid pandemic. Both reishi and cordyceps have been studied for the complementary management of symptoms associated with SARS-CoV-2 infection (viral replication, inflammation, haematological alterations) and post-Covid syndrome (tiredness, fatigue, insomnia, stress, etc.) with good results.

"Much research has also gone into the anti-tumour and anti-cancer properties of medicinal mushrooms, particularly reishi extract, which may be administered as a complementary/alternative therapy in conjunction with conventional treatment based on evidence it can improve tumour response 1.27 times, as well as enhancing patient immune response.

"Hifas da Terra have several ongoing clinical trials of note; a colorectal cancer clinical trial, MicroMarker Study (2018-2023), which used MicoDigest containing compounds derived from medicinal mushrooms and is evaluating its effects on gut microbiota, systemic inflammatory parameters, the immune response in 144 colorectal cancer patients among other effects on quality of life, digestive wellbeing and nutritional profile, and a second study, MicroImmunomama (2020-2023), which evaluates Hifas da Terra's Mico-Mama 2.0 supplementation in 120 breast cancer patients. Both trials are double-blind, randomised, placebo-controlled studies."





MUSHROOM BIOSCIENCE

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



How can I protect my bone health, post-menopause?



GEMMA KHOO RECOMMENDED: Rather than being the unchangeable solid mass that it was once thought to be, bone is a dynamic tissue which is sensitive to hormones, insulin, stress and inflammation. It is still true that for most individuals, they reach a peak bone mass in their early adulthood, but this doesn't mean there is nothing we can do once we are older. However, it is well documented that after menopause, women are vulnerable to weaker bones due to the lack of protection from good levels of oestrogen.

is to add soy foods to your diet. Research has found that soy foods rich in isoflavones favourably affect bone turnover and spinal bone mineral density in perimenopausal and post-menopausal women.

Calcium is a key mineral when it comes to bone health. However, there are other vitamins and minerals, such as magnesium, in particular, which also have a key role to

Top of the list when it comes to protecting your bones is exercise and that's because bone is a living tissue, which will react to increases in loads and forces by growing stronger. The best types of exercise to focus on are weight-bearing exercises such as yoga, brisk walking and hiking, running or racquet sports combined with some strength or resistance training sessions using free weights, weight machines or your own body weight.

Vitamin D is important for lots of aspects of health and not least for its role in building healthy bones. Vitamin D is essential for the bone growth and remodelling process carried out by osteoblasts and osteoclasts. It also supports calcium and phosphorus absorption in the intestines.

Another option

play and yet are often forgotten when it comes to bone nourishment. South American algae (*Algas calcareas*) is an excellent source of bioavailable calcium and other nutrients essential to bone formation including magnesium, boron, copper, manganese, silicon, nickel, selenium, strontium, phosphorus, potassium, vanadium, and zinc.

Look to address your acid: alkali balance. The major reservoir of alkaline base is the skeleton, in the form of alkaline salts of calcium, which provide the buffer needed to maintain blood pH when it becomes too acidic. If calcium salts are regularly pulled out of bone to balance an overly acidic diet, however, you can quickly see how the negative effects on our bones can occur.

Lastly, focus on increasing your omega 3s, EPA and DHA. Omega 3 fats helps to keep inflammation in check in the body. Chronic inflammation, regardless of its cause, activates bone cells called osteoclasts, and these are the cells that break bone down. In contrast, omega 3 fats can help to reduce inflammation and instead support the production of osteoblasts – the cells which build bone.



ABOUT THE EXPERT

Gemma Khoo BSc (Hons), MSc is Nutritionist and Regulatory Affairs Manager at Nutri Advanced. Gemma came to Nutri Advanced after completing a Masters degree in Nutrition at King's College London and has been a key member of the busy nutrition department for over 10 years, bringing extensive product and technical knowledge to the team. Gemma manages the regulatory affairs for Nutri Advanced, as well as the company's product development pipeline, regularly attending industry and trade events both in the UK and abroad.



Can you explain what palmitoylethanolamide is and the recommended therapeutic uses?

LUCY PARRY ADVISED: Palmitoylethanolamide, commonly known as PEA, is a fascinating nutraceutical ingredient. Whilst initially identified in egg yolk in 1957, PEA is an endogenous fatty acid amide that dates back hundreds of millions of years up the evolutionary path and is present in multiple dietary sources, including corn, soy and peanuts. Today, there is a growing research base to clarify the value and safety of PEA, with a plethora of research on its therapeutic value. Of its pleiotropic effects, PEA is best renowned for having potential anti-inflammatory, analgesic, and neuroprotective properties.

It is thought that PEA is endogenously produced on-demand in all tissues, as a protective response to injury, inflammation, and pain. A 2012 study aimed to assess both the efficacy and safety of PEA in reducing pain severity in patients with pain associated to different pathological conditions (including radiculopathy, osteoarthritis, and other diseases). Over a three-week period, 610 patients were administered 600mg of PEA twice daily, followed by single daily dosing for four weeks. Showing no adverse effects, PEA was found to significantly decrease the mean score pain intensity across the patients, with the effect independent of the pathological condition.

It is hypothesised that PEA does not operate through just one main mechanism of action, but that its multi-faceted effects can be attributed to a unique combination of mechanisms that affect multiple pathways at different sites, working both directly and indirectly within the central and peripheral nervous system.

Given that PEA performs a wide range of biological functions related to chronic and neuropathic pain and inflammation, it is unsurprising that there is research to suggest that the compound may help with other related conditions, including headache and migraine, joint pain and fibromyalgia. Other researched areas for PEA's application include:

- Neurodegeneration
- Immunity
- Exercise recovery
- Improved mood
- Improved sleep



Interestingly, PEA is often described as an 'alternative to cannabidiol (CBD)'; given that the therapeutic actions of both compounds overlap in their biochemical roles in humans. As we have seen, PEA is endogenously produced, differing from CBD which is not produced by the human body.

Additionally, within the medical literature, PEA has been substantiated by more than 40 studies for different benefits and is thought to be devoid of safety concerns. As such, it may be considered a safe and clinically proven alternative to CBD, conferring advantages in terms of its tolerability, consistency, and regulatory profile.



ABOUT THE EXPERT

Lucy Parry MChem (Hons) joined the team at Lamberts Healthcare as Senior Brand Specialist in 2020, having completed her Chemistry Integrated Master's at the University of York. Whilst her studies were primarily focused on medicinal chemistry, Lucy's interest in health and natural products led her into the exciting field of nutrition.



What is lycopene and how does it support healthy ageing?

DR MIRIAM FERRER EXPLAINED: Healthy ageing is the process of developing and maintaining the functional ability that enables wellbeing in older age¹. As the age of the global population continues to rise, we are all becoming more aware of the importance of maintaining a healthy lifestyle to ensure we can stay healthier for longer.

A growing body of evidence indicates that many chronic conditions that we associate with ageing, such as cancer, cardiovascular and neurodegenerative disorders, are linked to oxidative stress². Oxidative stress is caused by high doses of free radicals present in the body, either from internal or external sources.

Antioxidant nutrients are extremely important as they can diminish damage caused by oxidative stress in the body. Antioxidants are able to quench free radicals and prevent them from damaging cell components from oxidation³.

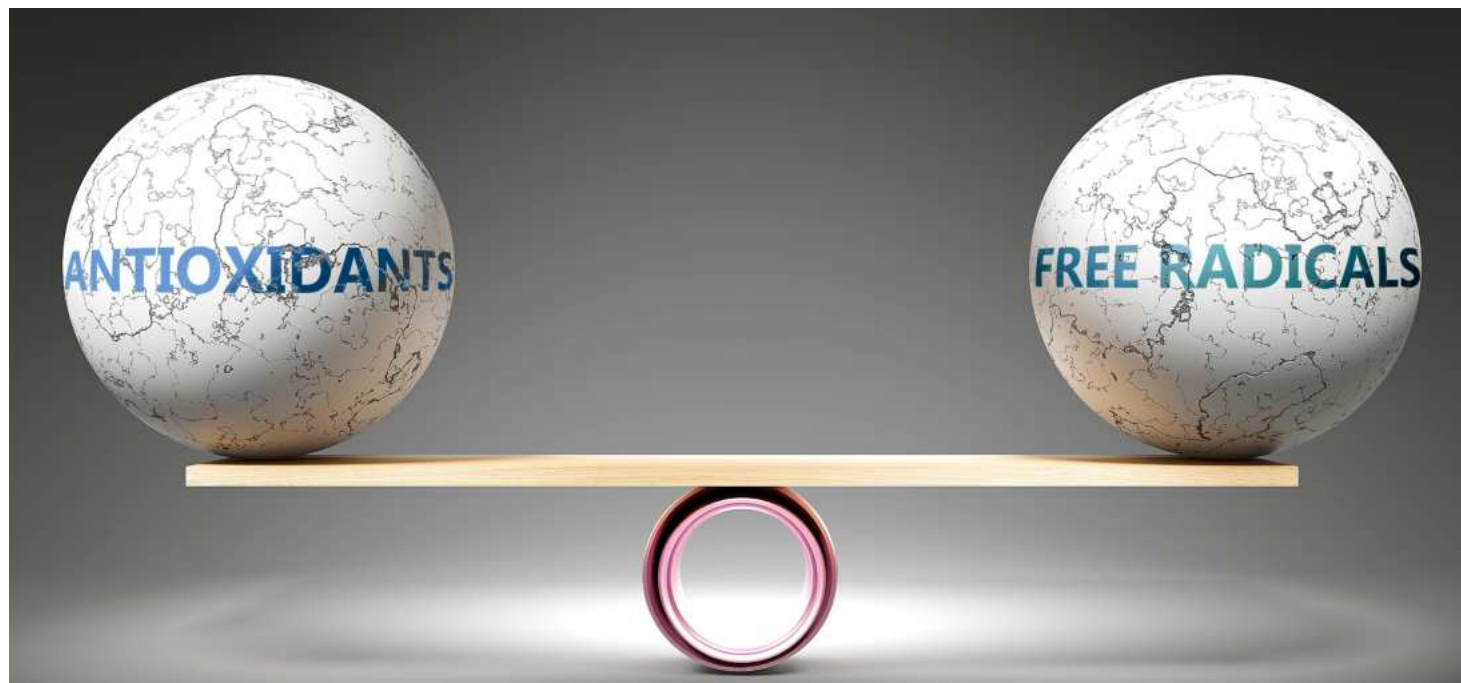
One such nutrient is lycopene. Lycopene is a lipophilic, unsaturated carotenoid, found in red-coloured fruits and vegetables such as tomatoes. Lycopene is considered a very effective antioxidant within the carotenoid group – it is about 10 times more potent than alpha-tocopherol and two times more potent than beta-carotene⁴.

Countries that follow the Mediterranean diet, rich in lycopene, have been shown to have lower prevalence of cardiovascular disorders⁶. In the context of chronic conditions, cardiovascular diseases are the number one cause of death (non-communicable) globally⁵.

Lycopene has anti-atherosclerotic properties, being able to reduce oxidation of LDL-cholesterol and increasing in HDL levels and paraoxonase 1 (PON1) activity, a hydrolytic enzyme responsible for most of the antioxidant properties of HDL^{2,7}.

Lycopene has also been shown to improve endothelial dependent vasodilation, often impaired in individuals who have suffered heart attacks⁸.

A recent systematic review showed that lycopene



supplementation can also improve blood pressure in hypertensive subjects⁹.

The best food sources providing lycopene in a bioavailable form are tomato paste and tomato sauce, as lycopene from fresh tomatoes or tomato juice is poorly absorbed. Cooking with oil greatly enhances the bioavailability of lycopene, as it releases the lycopene from the food matrix, as well as making it more abundant for micelles formation, therefore, improving its intestinal absorption¹⁰. In concentrated tomato extracts, such as food supplements, the poorly soluble lycopene is predominantly crystallised, which is one of the primary factors that reduces its bioavailability¹¹. One way to improve lycopene's solubility and bioavailability is to embed it in a whey protein matrix, a combination which has been shown to be as bioavailable as tomato paste¹².



ABOUT THE EXPERT

Dr Miriam Ferrer studied Biology at the University of Barcelona and obtained her doctorate at the Vrije Universiteit of Amsterdam, working on cancer gene therapy. She then took a post-doctoral research position at the prestigious MRC-LMB in Cambridge to work on DNA repair. Prior to becoming Head of Product Development at FutureYou Cambridge, Miriam worked for a leading supplier of research reagents for life science. Her scientific background helps her to evaluate research data and develop highly effective food supplements that are backed by science.



Spotlight on

hyaluronic acid

Nutritional Therapist, Alice Bradshaw, offers her insights into the varied uses of hyaluronic acid and how to ensure the most effective supplement for your clients.

Hyaluronic acid (HA) has in recent years become a well-recognised substance and commonly found in skincare products, eye drops and joint health supplements and for certain health conditions, it can be used in an injectable form.

This is testament to the versatility of this ingredient which offers a broad range of health benefits.

Found in almost every cell of the body (but concentrated in eyes, joints and skin), HA is a type of carbohydrate known as a polysaccharide or glycosaminoglycan (GAG). It comprises alternating d-glucuronic acid and N-acetyl-d-glucosamine. This naturally occurring compound is classified as a humectant, meaning that it possesses hygroscopic (water loving) properties.

HA has been shown to attract and retain large amounts of water, in fact, it's thought to hold 1,000 times its weight in water.

This explains why hyaluronic acid supplements are backed by research showing that they support health conditions that improve with hydration, such as dry eyes, joint problems and numerous skin conditions.

Humans are born with a high level of hyaluronic acid in the body (hence the plump, smooth and moist skin seen in infancy), and these levels decline with age. Many of the physical and aesthetic degenerative issues that are typically seen in more advanced years are partly as a result of a decline in levels of HA, along with the accompanying deterioration of collagen. Promising research shows that using exogenous sources of HA in several forms can offer both health and beauty benefits.



SKIN HEALTH

Perhaps the best-known use for HA is its ability to support skin health and moisturisation levels. The skin accounts for roughly half of all the HA found in the body.

One of the key reasons that skin loses elasticity and becomes more wrinkled with the ageing process is a loss of moisture. Other suspected factors are internal oxidative processes and excessive sun exposure.

While skin creams containing HA have been popular, research also suggests that oral supplementation can offer great benefits. As well as its hydrating properties, HA helps to promote collagen production, which is, of course, fundamental to skin strength and integrity. Reports of improved skin hydration, improved elasticity and reduction of wrinkle depth are common in mature subjects supplementing with HA. Hypothetically, HA supplements may be beneficial to various dermatological conditions and research supports its use to reduce the appearance of acne scars. Not surprisingly, many topical skin serums and ointments use hyaluronic acid as a key ingredient.



JOINT HEALTH

Elbows, hips, knees and other joints are surrounded by a synovial membrane made up of the capsules found at the end of the bones. Synovial fluid is secreted from this membrane and principally acts as an essential lubricator and shock absorber for the joints. Synovial fluid is a viscous liquid substance with a high concentration of hyaluronic acid, which keeps the joints hydrated and flexible.

Supplementing with HA has been shown to improve joint lubrication and joint function, while reducing stiffness. Additionally, a reduction of inflammation has been observed, resulting in subjects being able to reduce their use of NSAIDs.

One study showed that supplementing with HA over an eight-week period helped to relieve symptoms of osteoarthritis. Glucosamine, another popular supplement for joint health, works synergistically with hyaluronic acid and both can often be found in joint support formulations.



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



OTHER BENEFITS

Hyaluronic acid supplements have a wide range of potential benefits in various health conditions where hydration and lubrication are paramount.

Dry eyes is a common condition associated with considerable discomfort. Many eye drop formulations contain HA and research has shown that they significantly improve the condition of the eye's surface environment and relieve discomfort. Additionally, supplements containing HA may help stabilise and protect the eye. HA is an integral component of the tear film, the mucosal membrane that protects the surface of the eye from environmental irritants and pollutants.

HA supplements have also been implicated in the wound-healing and tissue regeneration processes. Where skin is damaged, HA may expedite cell turnover while reducing the chances of infection and scarring.

Studies also suggest a role in modulating inflammation, as well as the reduction of oxidative stress – factors which account for the many purported health benefits of this supplement.



CHOOSING A SUPPLEMENT

Hyaluronic acid supplements were once typically made using rooster or chicken cones, but it's now more common to find non-animal derived formulas.

Supplements (and some HA products) are characterised by the size of the molecules or 'molecular weight'. Different molecular weights of hyaluronic acid have different properties and the benefits and applications of hyaluronic acid differ depending on the molecular weight of the raw material being used. For example, low molecular weight is especially indicated for skin benefits, while high molecular weight is indicated for joint health. This may determine the type of supplement you choose according to health needs.

More recently, manufacturers are producing more advanced HA supplements with a full spectrum of molecular weights (low, medium, high). One fundamental benefit to a broad-spectrum weight supplement is that it will be indicated for all possible applications, meaning that the customer no longer needs to seek specific types of HA according to their health concerns.

Another factor worth looking for in a supplement is the addition of other synergistic ingredients. For example, an HA supplement that it targeted at skin health may also feature zinc, silica and/or vitamin C, while those targeted at joint health may also provide glucosamine, MSM or other joint-supportive nutrients.

FutureYou
CAMBRIDGE

A practitioner future

With a new programme launched to support nutritional therapists, FutureYou Cambridge is laying the foundations for a strong practitioner partnership, as its CEO, Adam Cleevely, explained.

The last couple of years has been a turbulent time for many businesses, and in the world of nutritional therapy, while we have seen a welcome rise in interest of natural health, for NTs, having to adapt to a new way of practicing, especially in the early days of the pandemic, has certainly been a challenge.

And in recognition of the critical role that practitioners play in the health of the nation, the supplement brand, FutureYou Cambridge, has launched a new programme designed to support you and the work you do.

CEO, Adam Cleevely, explained: "We developed the practitioner programme as we realised that some practitioners were already signed up to our consumer site and we wanted to enable them to have a structured programme where they could support their clients to achieve a better quality of life. We now have a dedicated practitioner support team based in our Cambridge headquarters and are providing BANT approved, structured training materials, to help practitioners understand what makes our science-backed supplement range different to others, so that they can easily explain those differences to their clients.

"We have also developed a reward and commission scheme that is the best in the UK when ordering directly

from us. Practitioners will have access to scientific research that shows our unique products and patented formulations. These formulations provide the optimal absorption (bioavailability) of key ingredients, so that the body receives more of what it needs to where it's needed. We are shortly going to start releasing CPD training on the platform too, so that practitioners can learn about the incredible science behind our products."

And this programme is backed up with an impressive range of expertise within the business.

"The scientific hub of Cambridge is part of our identity. It's where we call home. It's where we have developed close ties with world-leading institutions and highly regarded nutritional and medical experts who advise us," Adam added.

"As well as our scientific and nutritional advisory panel, we have two in-house scientists; Dr Miriam Ferrer PhD, Head of Product Development, and Dr Max Gowland PhD, Chief Scientific Officer on the product development side of the business. We also have a wide range of expertise in all the other different areas of our business, including logistics, technology, trends analysis, marketing and perhaps, most importantly, our award-winning customer care team, that enables us to continue to deliver a first-class service to our customers and now our practitioners too."

ESTABLISHING THE BRAND

FutureYou Cambridge was founded in 2012, before Adam joined three years later.

Starting out with just a team of four, Adam's vision was to create a health supplement company that made a positive difference to people's lives, not only for customers but for the people who work there too, as he explained, "a place that felt friendly, inspiring, supportive and relaxed".

from four to 35 people with over 200,000 customers and international partnerships in central Europe, Sri Lanka, Australia and Hong Kong.

But what is it that Adam believes make the brand unique in what is a busy market?

"As well as a number of patented products within our product range, our key USP is that we set a very high bar of clinical proof for products before we consider listing or selling them. One of our products has over 40 clinical papers published supporting it. Products like that, proven

When it comes to the pandemic, and how the business adapted, Adam advised: "During the pandemic, the company set up working from home seamlessly as we already had the technological support to do so before we had to. During lockdown, we were thrilled to win Gold in Investors in People, which we entered for the first time during Covid. In November 2022, FutureYou Cambridge acquired Prime Fifty, a specialist supplement company targeting the over 50s market."



Adam was attracted to the business by an incredible product with amazing clinical data, Ateronon (The Tomato Pill), developed with a patented lycopene called LactoLycopene.

Adam explained: "This ingredient has just won ingredient of the year in the healthy ageing category at the highly competitive NutraIngredients USA Awards 2022."

On the back of this, the FutureYou Cambridge brand was launched in 2016. And now, seven years on, FutureYou Cambridge has grown

products, just work. They make a real difference to people's lives. And that makes all the difference to customers: our products work so people come back time and time again," he commented.

"We also treat every individual's health and wellbeing with the respect and importance it deserves; that's why customers trust us and we have the rare (in our sector) rating of excellent on Trustpilot, with over 5,500 reviews. Service is key to everything we do, and customers rave about the standards of care they receive from us."

And as we come out the other side of the pandemic, the business will continue to evolve, as Adam added: "We are a growing business and are always looking for other brands we can bring on board in the future. We are also very excited about the launch of our practitioner programme and are looking forward to expanding that in the future, developing more educational materials for practitioners and attending more events where we can meet nutritionists in person and listen to their feedback, so that we can tailor our programme to their needs."



FutureYou CAMBRIDGE

THE FUTUREYOU RANGE

Today, the portfolio stands at more than 50 individual products in ranges covering immunity support, bones and joints, beauty, brain, digestive, energy, eye, heart and circulatory health for adults, as well as specialist men's and women's health, and pet care.

Adam commented: "We're very well known for our success with Turmeric+. It's a powerful, natural anti-inflammatory so is popular for treating many issues, from delayed onset muscle soreness for athletes looking how to push that bit harder, to arthritis for customers who struggle to open a jam jar. We've also had big successes in our cardiovascular range (which was our original product range), including Ateronon Heart+ (The Tomato Pill), and Blood Flow+ (cocoa flavonols) – both natural products that help blood move more easily around the body.

"Our lycopene/tomato products have drawn continued attraction and more recently were shown to increase motile sperm in healthy men by up to 70 per cent. Early indicators with our newly launched practitioner programme is that our gut product, ProBio8+, developed with Probioact Technology, is proving very popular in particular, as well as our new Quercetin+ supplement."

He went on: "Our successes are due to the science behind them, and because they're all formulated to be easy-to-absorb so make a difference to the wellbeing of our customers."

And Adam reminded that the practitioner programme is now up and

running and ready to access.

"All those wanting to access our practitioner programme simply need to sign-up via our website at <https://futureyouhealth.com/practitioner-programme>, we also have a dedicated email and contact telephone number for practitioners for further information or to discuss any of our product range in more detail – pp@futureyouhealth.com or

01223 657575," he commented.

"After signing up, they will be contacted by one of our team to enrol them in our dedicated programme and will be given access to the Practitioner website. Practitioners will also be given two unique codes to use, one for their personal use and one for their clients."



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Bali breakfast stack



Kari pap pusing (curry puffs)



Spiced carrot and pineapple cake



Himalayan energy bars



Bali breakfast stack

This recipe can be served for brunch or as a light meal at any time of day. The fritters can be cooked then chilled or frozen, then reheated in a medium-hot oven. The spicy ratatouille also freezes well, so it is worthwhile doubling the batch. The tamarind sauce will keep for several weeks in the fridge, stored in a sterilised airtight jar.

Serves 4

Ingredients:

- 300g canned or fresh corn (or substitute sprouted mung beans or beansprouts)
- 4-5 kale leaves, stems removed and thinly sliced, or use other dark cabbage
- 1 small red onion, thinly sliced
- 1 spring onion, thinly sliced
- 75g rice flour
- 75g gram flour (chickpea flour), sifted
- 200ml cold water
- 1 tsp ground cumin
- 1 tsp freshly grated turmeric root, or use ½ tsp ground turmeric
- 1 tsp salt
- Small handful of freshly chopped coriander

Ratatouille:

- 1tbsp olive oil
- 2 fat garlic cloves, finely chopped, or use 2tsp garlic paste
- ½ tsp dried chilli flakes, or use chilli powder
- 1tsp salt
- 1 large aubergine, cut into 1.5cm/½ in cubes

- ½ red pepper, cut into 1.5cm/½ in pieces
- ½ green pepper, cut into 1.5cm/½ in pieces
- 1 small courgette, cut into 1.5cm/½ in cubes
- 4 large tomatoes, cored and roughly chopped, or use a 400g can plum tomatoes

Tempeh bacon:

- 80g tempeh, thinly sliced into 8 pieces
- 2tbsp soy sauce, or use tamari
- 1tsp culinary/unflavoured coconut oil, or use good-quality vegetable oil

Tamarind sauce:

- 2tbsp tamarind pulp, plus 2tbsp water, or use 1tsp tamarind concentrate, plus 4tbsp water
- 2tbsp coconut sugar, or use unrefined brown sugar

To serve:

- 2 large handfuls rocket or lamb's lettuce (optional)
- Handful of coriander
- Sambal balado

Method:

- Start by preparing the ratatouille. Add the oil to a heavy-bottomed pan, then add the garlic and place over low heat. Gently cook the garlic for two minutes, then add the dried chilli flakes and salt. Add all the vegetables except the tomatoes and mix well. Turn up the heat to medium and sauté all the vegetables until starting to soften and brown on the edges. Now add the tomatoes and a splash of cold water (or tomato juice if using canned). Bring to a simmer and cook over low heat for 20-30 minutes.
- To make the fritters, add all the ingredients to a large bowl and, using one clean hand, mix well until everything is combined. The mixture should be a thick porridge-like consistency.
- Preheat the oven to 190°C (375°F) Gas 5.
- Place heaped tablespoons of the mixture at even spaces on the lined and greased baking sheet. Wet the spoon and gently flatten the mixture to make little patties. Bake in the oven for 20-25 minutes, turning once after 10-15 minutes of cooking.
- For the tempeh bacon, place the tempeh slices on a plate and cover in the soy sauce. Set aside for five-10 minutes to marinate. Place a large frying pan/skillet over high heat and add the oil. Gently lay the slices into the pan and fry until crispy brown, about two to three minutes on each side. Drain on paper towels and set aside (or place on baking sheet in the oven to keep warm).
- To make the tamarind sauce, add the ingredients to a small pan and bring to simmer. Cook until the liquid has reduced by half, and you have a thickened dark sauce. Set aside to cool.
- To serve, place a small handful of rocket or lamb's lettuce (if using) in the centre of each plate. Next, stack three or four fritters on top of the greens, then add two to three tablespoons of ratatouille on top. Drizzle over the tamarind sauce, making a circle around the stack. Top the stack with a couple of slices of crispy tempeh and a few coriander leaves. Serve immediately with a side of sambal.



KARIPAP PUSING
(CURRY PUFFS)



SPICED CARROT AND
PINEAPPLE CAKE



HIMALAYAN
ENERGY BARS

Karipap pusing (curry puffs)

Malaysian curry puffs are an incredibly popular snack, usually stuffed with spiced potato, either with or without chicken. They remind me a little of samosas, with a similarity in toasted spices, and especially when they're fried. I try not to eat fried food very often, as it can be a highly inflammatory food to the body, especially when eaten in excess. These flaky, baked little puffs are lighter, but equally delicious.

Makes 20

Ingredients:

- 350g plain flour, or use gluten-free flour, plus extra for dusting
- ¼ tsp ground turmeric
- 75g block-style vegan baking margarine, cut up and chilled
- 1tbsp vegan egg replacement, such as Orgran, mixed with 3tbsp water
- 1tsp salt
- 1tbsp good-quality vegetable oil, plus extra for brushing
- 100ml cold water

Filling:

- 1tbsp black peppercorns
- 2tsp fennel seeds
- 1 star anise
- 5cm/2in cinnamon stick
- 2tbsp culinary/unflavoured coconut oil, or use good-quality vegetable oil
- 2 banana shallots, finely chopped
- 2.5cm/1in thumb of fresh ginger, peeled and finely chopped, or use
- 1 heaped tbsp ginger paste
- 250g white potatoes, peeled and cut into 1cm/½ in cubes
- 1 large sweet potato, peeled and cut into 1cm/½ in cubes (about 250g)
- 1tsp salt

- 2 brown onions, finely chopped
- Large handful of freshly chopped coriander
- 1 large spring onion, thinly sliced

Method:

- Start by making the filling. Place the dry spices into a small frying pan and lightly toast until fragrant. Place in a spice grinder and blend to a fine powder. Add two tablespoons of water to the mixture and blend again to make a paste. Set aside.
- In a wok or large, deep frying pan, add the oil, shallots and ginger. Place over low-medium heat and cook gently until the shallots are just translucent. Add the spice mixture and continue to cook for another minute. Now add the white potatoes plus 300ml water. Mix well and bring to a simmer. Reduce the heat to medium and cook for five minutes, then add the sweet potato and continue to cook for another 10-12 minutes until the potatoes are soft and the mixture is almost dry. Add the remaining filling ingredients and mix well. Set aside to cool.
- Preheat the oven to 180°C (350°F) Gas 4.
- Place 100g of the flour into a bowl along with the turmeric. Rub

- in the margarine to make a rough breadcrumb-like texture. Knead until a dough forms, then cover and set aside.
- Place the remaining flour into a bowl with the vegan egg mixture, salt, oil and cold water. Combine to form another firm dough. Divide each dough mixture into five large balls. Take one of the white dough balls and flatten in the palm of your hand. Place one of the yellow dough balls in the middle and wrap the outer dough around the outside to make a large dough ball. Repeat with the remaining dough balls, so you have five large dough balls.
- Sprinkle a work surface with flour and, using a rolling pin, flatten each ball to a large oval shape, then roll to make a long strip. Cut each piece of dough into four pieces and roll each piece again until you have four roughly oval shapes, 5mm/¼ in thick.
- Place a spoonful of filling into the centre of a pastry piece and fold to make a half-moon shape, pinching and folding around the edge. Repeat with the remaining pastry and filling, arrange on the lined baking sheet and brush with oil. Bake in the preheated oven for 20-25 minutes until golden brown. Serve warm.



BALI BREAKFAST



HIMALAYAN
ENERGY BARS



SPICED CARROT AND
PINEAPPLE CAKE

Spiced carrot and pineapple cake

Sri Lankan pineapples are a popular ingredient in Sri Lanka, and the local spices and pineapples make a perfect pairing for carrot cake. Using flours higher in nut protein – and reducing the more refined sugars by adding extra fruit for sweetness – this lightly spiced cake has a tropical feel and will satisfy sweet cravings, as well as providing a little helping of nutrients.

Serves 8-10

Ingredients:

- 250ml unsweetened soya milk
- 250ml/coconut oil, melted, or use plain vegetable oil
- ½ tbsp apple cider vinegar
- 115g coconut sugar
- 60ml pure maple syrup, or use date syrup
- 125g plain flour, or use 125g gluten-free flour, plus ¾ tsp xanthan gum,
- 165g blanched ground almonds
- 55g coconut flour, or use an extra 100g blanched ground almonds
- ¾ tsp salt
- 2tsp baking powder
- 2tsp bicarbonate of soda/baking soda
- 1½ tbsp ground ginger
- 1 scant tbsp ground cinnamon
- ¼ tsp ground nutmeg
- ¼ tsp ground cloves
- 280g grated carrot (about 3 carrots)
- About 250ml crushed pineapple (use a 240g can of 4 rings, juice drained and blended, or 120g fresh pineapple, blended)
- ½ tsp vanilla bean paste, or use 1tsp pure vanilla extract or seeds of ½ vanilla pod
- 125g walnut pieces
- 4 round cake pans, 15cm/6in diameter, lightly oiled and base-lined

Cashew frosting:

- 240g cashew nuts, soaked in cold water overnight
- 215g coconut yogurt
- 1½ tsp pure maple syrup
- 1tbsp freshly squeezed lemon juice
- ¼ tsp vanilla bean paste, or use 1tsp pure vanilla extract
- Pinch of salt
- Candied pineapple pieces, to decorate (optional)

Method:

- Preheat the oven to 170°C (340°F) Gas 4
- Mix together the soya milk, oil, vinegar, coconut sugar and maple syrup in a large bowl and leave to curdle for five minutes.
- Sift the plain flour (or gluten-free flour and xanthan gum) into a separate bowl, then add the blanched ground almonds and coconut flour, if using. Add the salt, baking powder, bicarbonate of soda/ baking soda and all the dry spices. Mix together well.
- Combine the milk and oil mixture with the dry ingredients, adding it gradually but mixing quickly, and making sure there are no lumps in the batter.

Then add the grated carrot, crushed pineapple, vanilla and three-quarters of the walnut pieces, mixing together quickly again.

■ Divide the batter between the cake pans. Place in the preheated oven immediately and bake until they are evenly risen and cooked through, about 35-40 minutes, or until a skewer inserted comes out clean. Run a knife around edge of the cake pans and turn the cakes out onto wire racks to cool completely.

■ To make the cashew frosting, blend the soaked cashews and yogurt until they form a smooth cream. Add the maple syrup, lemon juice, vanilla and salt, then blend again. Add a spoonful of water if needed – the cashew frosting should be very thick but spreadable.

■ Using a palette knife or metal spatula, stack the sponges, spreading a generous layer of frosting between each layer. Cover the outside and top of the cake with frosting, too. Sprinkle with the remaining walnuts. You can pipe some of the leftover frosting on top and add whatever decorations you like, such as candied pineapple pieces. Place in the fridge until needed.



KARIPAP PUSING
(CURRY PUFFS)



BALI BREAKFAST



HIMALAYAN
ENERGY BARS



Himalayan energy bars

I learned on many retreats, and from my Indian fasting friends, that nutrient density is essential when 'breaking fast', whether fasting intermittently or for several days. I make these bars for our retreat guests who like to hike up our local mountains and adventure into the wilderness. The perfect backpack snack! They are nutritionally balanced, full of energy, high in iron and vitamin C (a very important combination for vegans and vegetarians), high in good fats and boast a decent hit of protein.

Makes 14

Ingredients:

- 120g cashew nuts
- 90g walnut halves
- 140g whole skinless almonds
- 75g pumpkin seeds, soaked and roughly chopped, or use sunflower seeds
- 25g pitted dates, finely chopped, or use dried mulberries
- 100g desiccated coconut
- 60g goji berries, or use dried mulberries
- 2½ tbsp date syrup, or use pure maple syrup or unrefined coconut sugar
- 1tbsp chia seeds, soaked in 2tbsp water
- ½ tsp salt
- 1tsp vanilla bean paste, or use vanilla extract or seeds of ½ vanilla pod
- 30 x 20cm/12 x 8in baking tray/sheet pan, lined with parchment

Method:

- Preheat the oven to 165°C (325°F) Gas 3.
- Place half the cashews, walnuts and almonds into a food processor or blender and lightly blitz. Place the remaining nuts onto a chopping board and roughly chop. Put the blitzed and chopped nuts into a large bowl and add all the remaining ingredients. Using your hands, mix everything really well.
- Tip the mixture onto the lined baking tray. Using the back of a spoon, gently press the mixture into the pan and spread it evenly.
- Bake in the preheated oven for 20-25 minutes until just golden brown.
- Allow to cool completely before turning out onto a chopping board and peeling off the paper. Using a sharp knife, cut into 14 small bars. The bars will keep for up to one week in an airtight container.



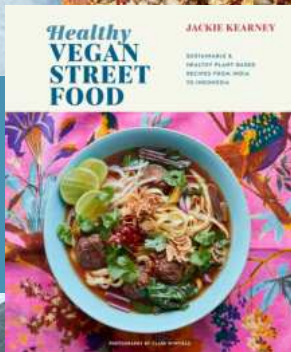
BALI BREAKFAST



SPICED CARROT AND PINEAPPLE CAKE



KARIPAP PUSING (CURRY PUFFS)



Healthy Vegan Street Food by Jackie Kearney, published by Ryland Peters & Small (£20). Photography by Clare Winfield © Ryland Peters & Small.



I-Mag giveaways



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



CytoPlan Premium CBD

Recently launched is CytoPlan's Premium CBD, which provides 25mg of pure CBD oil from organically grown hemp in soft gel capsules. Premium CBD is THC-free and free from GMO, pesticides and herbicides.

I:Win: We have a one-year's supply, of 12 pots, to give away to one reader.

Pure Encapsulations PureGenomics UltraMultivitamin



This comprehensive multivitamin/mineral supporting PureGenomics, with pre-formed vitamin A for individuals with decreased conversion efficacy of carotenoids. It provides 3,000 IU vitamin D3 for supporting optimal levels and includes 100mg of choline, which contributes to normal homocysteine

metabolism, particularly for individuals with MTHFR or PEMT genetic variations. With vitamin B12 as adenosylcobalamin and hydroxycobalamin, which contributes to normal functioning of the nervous system and psychological function, it provides a targeted blend of alpha lipoic acid, vitamin C, CoQ10, and n-acetylcysteine, with the macular carotenoids, lutein and zeaxanthin.

I:Win: We have eight to give away.

GOOD HEALTH NATURALLY IONIC IRON

As an easy-to-take liquid, Ionic Iron provides superior bioavailability, in the form most recognised to the body. Research indicates that iron is vital for proper enzyme and cognitive function, along with energy production and a healthy immune system. Non-GMO and gluten-free, it offers flexible dosing for all ages and is suitable for both vegetarians and vegans.

I:Win: We have three to give away.



HIFAS DA TERRA MICO-VIR

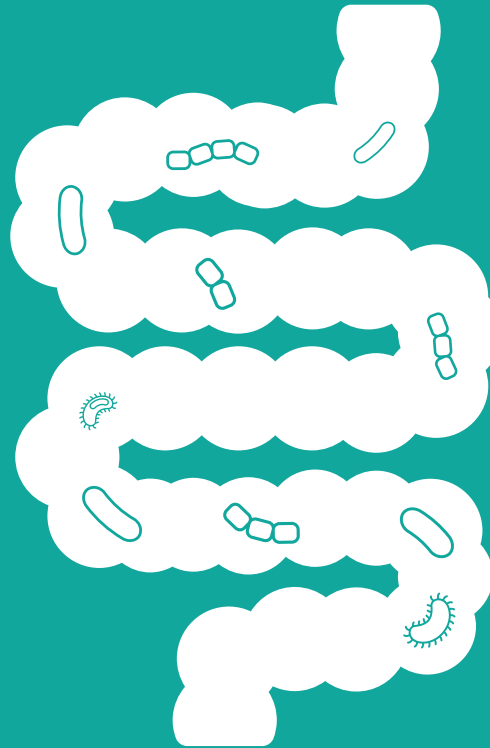
The new Mico-Vir combines the potency of reishi and cordyceps extracts for a powerful, broad-spectrum antiviral formula for use in both the acute phase of an infection and during the recovery process, as well as in case of associated persistent symptoms such as fatigue or muscle weakness, sleeping difficulties and anxiety or depression.

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