



Nutrition I-Mag

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JANUARY/FEBRUARY 2023

The fertility diet

The latest guidance around nutrition and supporting fertility

THINK BRAIN HEALTH

How to support healthy cognitive function

Detox design

A practitioner protocol for effective cleanse and weight management

ROUNDING OFF A SUCCESSFUL IHCAN CONFERENCE SEASON ♦ PROBIOTICS – THE LATEST EVIDENCE
♦ READER GIVEAWAYS ♦ JOINT CARE SUPPLEMENTS ♦ RESEARCH FOCUS AT HIFAS DA TERRA

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Welcome



As 2022 draws to a close, it's time to reflect on what the year has brought, both in relation to our industry getting back to some normality in terms of in-person practice and educational events, but also in the levels of stress and anxiety that has been triggered with the cost-of-living crisis.

These levels of stress are at an all-time high, not helped coming off the back of the Covid-19 pandemic and all the long-term effects this has had on both our

physical and mental health. Collectively, these world events – totally out of our control – raise our risk of a range of health issues.

One such area is around our cognitive function. Not only are levels of conditions such as dementia on the rise, and set to keep rising, but we also know the like of brain fog are common symptoms of long Covid, something that is set to be a health issue for many years to come. And so,

we turn the focus on brain health in this issue of *Nutrition I-Mag*, in which we hear from a range of nutrition experts who offer their insights into the most effective protocol you could recommend to your clients. **Click here** to read.

We also bring a range of other health topics to the fore in this issue, including the need to detox the system, and also highlight matters around fertility and how you as a nutritional therapist can help. Finally, we bring you exciting details of the IHCAN Conference series of events for 2023; **click here** to find out more.

And finally, don't forget the *Nutrition I-Mag* Product Awards are still open for voting; simply **click here** to find out what's in the running and to vote. We will be announcing the results in the March-April issue.

All that remains is for the whole team at *Nutrition I-Mag* to thank you for your support throughout 2022. We hope we have helped you in your studies, whether through this CPD accredited magazine or our series of educational events – we look forward to bringing you more in 2023.

RACHEL SYMONDS, EDITOR

Rachel

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CONTENTS



CLEANSE AND WEIGHT MANAGEMENT

The healthiest and most effective approach to a New Year cleanse



FERTILITY EDUCATION

Support your clients seeking to improve their ability to conceive



BRAIN HEALTH

The nutritional interventions to guard against cognitive decline



CONFERENCES 2023

Looking ahead to an exciting year of IHCAN Conferences



RECIPES

Inspiration for warming up your healthy cooking this winter



COMPANY PROFILE

Hifas da Terra – a company investing in research and development to ensure quality

NEWS

The developments in the world of nutrition

RESEARCH

We bring you up to date with the latest scientific news

PRODUCT WATCH

What's new to market

ASK THE EXPERTS

Nutritional experts answer your questions

INGREDIENT FOCUS

The latest research around probiotic supplements

NUTRITION I-MAG GIVEAWAYS

OUR CONTRIBUTORS

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



Rosie Rayner

Rosie Rayner ND, DipCNM, mANP has been a Clinical Nutritional Therapist, Naturopath and Iridologist since 2015. As well as practising in her own women's health clinic, she works as part of the technical team at Bionutri, where she now can bring her expert knowledge together and help other practitioners too.



Ben Makeham

Ben Makeham is a qualified Naturopath (BHSc Nat), having studied in Melbourne Australia, and is currently Science & Research Communications Manager at Activated Probiotics. Ben is a strong proponent of evidence-based complementary medicine, with a special interest in novel therapeutic applications of the gut microbiome and live biotherapeutics.



Helen Drake

Helen Drake Bsc (Hons), Dip Nutritional Therapy, mBANT, rCNHC, AFMCP joined Cytoplan in June 2016 as Nutritional Therapist based in the South East, who offers tailored expert advice to all Cytoplan customers and support to practitioners and students. As a BANT and CNHC Registered Nutritional Therapist, Helen worked in private practice with clients suffering from a wide range of conditions, including fertility and hormonal imbalances, digestive issues, skin conditions, arthritis and weight management. In 2012, Helen began as lecturer at the College of Naturopathic Medicine.



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. Having learned healing traditions from around the world and realising the importance of living in harmony with nature, 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.



Lindsay Powers

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



Keri Briggs

Keri Briggs is Senior Nutrition Specialist at Lamberts Healthcare. She graduated in 1999 with a BSc in Human Nutrition and has worked for Lamberts Healthcare since 2000, firstly as a Technical Advisor and now as Senior Nutrition Specialist. In this time, she has been involved with training sales representatives, working on clinical trials and writing PR and trade articles.

News Bites

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

Scientists urge Brits to start taking vitamin D supplements



between October and March, when the days are shorter, the nights are longer and exposure to sunlight is lessened. This number is increased to 78 per cent in young adults aged between 18-24 – a life stage when bone health is particularly important.

And the ability for people to afford supplements has reportedly been impacted by the cost-of-living crisis, with 17 per cent of respondents revealing that they are buying dietary supplements less often.

The latest British Nutrition Foundation survey, which was conducted by YouGov, revealed that 15 per cent of respondents believe that they don't need to take vitamin D supplements as they get enough from their diet or sunlight. It also highlighted a lack of knowledge about the role and benefits of vitamin D, with eight per cent of respondents admitting that they do not take vitamin D as they aren't aware of the benefits of consuming them.

Interestingly, out of the respondents this year who regularly or sometimes take vitamin D supplements, 38 per cent do so to maintain or improve their general health, yet less than a quarter (24 per cent) do so to keep their bones healthy.

Commenting on the findings, Sara Stanner, Science Director at the British Nutrition Foundation, advised: "The latest National Diet and Nutrition Survey data shows that one in six people in the UK have low vitamin D levels in their blood. Looking at the proportion of people who are even aware of this recommendation, there is still much to be done to

raise awareness of the recommendation that we all consider taking a 10mcg supplement during the autumn and winter months, as uptake of this advice is still too low."

In other British Nutrition Foundation news, the organisation has launched a new professional development programme, called Teaching Primary Food and Nutrition.

The foundation, with support from the All Saints Educational Trust, has unveiled Teaching Primary Food and Nutrition (TPFN), a professional development programme for primary teachers, trainees and teaching assistants across the UK. It is designed to provide teachers and support staff with the necessary knowledge and skills required for teaching high quality food and nutrition lessons, and to inspire them to champion a whole school approach towards food.

A two year Continuing Professional Development (CPD) programme, TPFN is free for primary schools educating pupils in food and nutrition across the UK. Whether the participants are new teachers or have prior experience, TPFN aims to build and strengthen their confidence and competence in teaching food and nutrition to their pupils. It will formally support their professional learning around teaching in the classroom and support a whole school approach.

Stanner explained: "At the British Nutrition Foundation, we passionately believe that food education is an essential life skill for all. Whether you are a new teacher who is just starting their teaching journey or have been working with pupils for some time now, our Teaching Primary Food and Nutrition programme has something to offer to everyone as learning and refreshing skills should never stop!

"We are excited to work with the All Saints Educational Trust again and hope this programme will offer support to our hard working primary teachers and TAs, wherever they are in the UK."

Find out more at www.foodafactoflife.org.uk/teaching-primary-food-and-nutrition/

Experts are urging the public to take vitamin D supplements to support their health this winter.

The call was issued by scientists at the British Nutrition Foundation ahead of the shortest day of the year, which took place on December 21 and comes off the back of a new survey revealing more than two-thirds (68 per cent) of British adults are not aware of the Government's recommendation to take daily vitamin D supplements

Cytoplan unveils revamped practitioner hub

A new online hub to help support practitioners has been launched by Cytoplan.

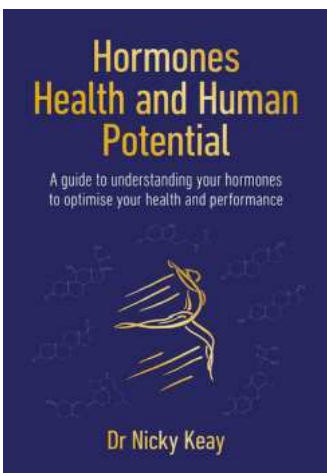
New features have been added to the new hub to better support practitioners, including basket sharing for clients, alongside its practitioner commission scheme.

Health practitioners registered with Cytoplan will now be able to create an online 'basket' for their clients and share the products they recommend, enabling clients to buy with just a click, and as part of the fresh new look, the Practitioner Hub is easier to navigate and contains a wealth of free educational resources, including live training and monthly webinars, as well as new product guides too.

The new client marketing section includes easy-to-download consumer-friendly booklets, product photography and marketing banners and on the horizon, a new commission tool will be unveiled in 2023, which will provide Cytoplan practitioners with a report so they can view and analyse commission earnings via their clients.

Amanda Williams, CEO of Cytoplan, commented: "Health practitioners are the cornerstone of why Cytoplan exists to this day, and although we supply directly to consumers via our website too, our values lie with supporting practitioners to help us in our goal of improving the nation's health and we know our health practitioners and their businesses are what fundamentally drives this across the UK."

"We have been listening to our practitioners for some time and have been working hard to relaunch our practitioner hub that truly supports them with live training, webinars, current industry information and enables them to easily recommend products and navigate their clients to find products that they recommend. We will continue to help practitioners thrive both professionally and financially, and we thank them for their loyalty to our brand and products. We hope the new 'basket sharing' feature alongside our industry-leading commission scheme will be welcomed and we are excited to launch commission reports next year, which will allow practitioners to view what they've earned via their clients too."



Hormonal help in new guide

An endocrinologist has penned a new book focused around maximising our hormones to achieve our potential.

Hormones, Health & Human Potential has been written by Endocrinologist, Dr Nicky Keay, and advocates the central role hormones play in our overall health and performance. Dr Keay outlines how we can all harness our hormones for maximum benefit, whether

connected to health, sport, perimenopause, menopause or RED-S.

Aims of the book includes how we can harness and maximise our hormones, practical tips providing actionable advice, and helping us all to improve health and all aspects of performance

Dr Keay is a medical doctor with expertise in the field of exercise endocrinology. Graduating from Cambridge University, she is Honorary Clinical Lecturer in the Division of Medicine, University College London. Dr Keay's clinical and research endocrine work is particularly used with dancers and athletes, with a focus on relative energy deficiency in sport (RED-S) and with women experiencing perimenopause and menopause.

Chris Kilham with Aimée Benbow



Herbal education on tour

Viridian has been helping to bring botanical education to the UK as part of its recent lecture tour.

The ethical supplement company joined forces with 'Medicine Hunter, Chris Kilham, to bring knowledge on healing botanicals to the UK, which focused on the importance of the sustainability of nature's powerful ingredients and why provenance matters.

Chris, an author, educator and botanical expert, discussed popular and highly effective medicinal plants, such as saffron and ashwagandha, and meeting the passionate growers and communities in their native countries.

He commented: "I travel to many remote locations around the world in search of botanicals, so it's a privilege to be able to share these rare photos and insights with health retailers, to aid their understanding of specific herbs. I've really enjoyed seeing health stores in the UK and Ireland and meeting them face-to-face. They've been a very enthused and engaged audience, which is great to see."

Aimée Benbow, Head of Nutrition at Viridian Nutrition, also spoke during this seminar tour about botanicals supporting menopausal symptoms and carried out book signings of the new guide, *The Menopause Journal*.



In Research

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

Lancet study revealing micronutrient deficiency should act as wake-up call, organisation urges



A new report revealing the true extent of global malnutrition has been described as a wake-up call from a leading nutrition group.

IADSA has developed a new Mind the Gap resource, highlighting what it describes as the shocking findings of a scientific review exposing the true extent of global malnutrition. The study, published in *The Lancet*, revealed that more than half of preschool-age children and over two thirds of non-pregnant women of reproductive age worldwide have a micronutrient deficiency.

In the report, *Wake-Up Call: Experts sound the alarm over micronutrient deficiencies*, IADSA explains the key conclusions from the study and explores how best to address the issues raised.

The researchers looked at data for deficiencies in iron, zinc and vitamin A in preschool-age children, and iron, zinc, and folate in non-pregnant women of reproductive age. The burden of deficiency in at least one micronutrient was 56 per cent for children and 69 per cent for women. Furthermore, levels of malnutrition were at their worst in the developing world but were also widespread in

high-income countries.

The review was led by the Global Alliance for Improved Nutrition (GAIN) and the Micronutrient Forum (MNF). Following publication, GAIN and MNF said there was now an “urgent” need for action. They also said the findings suggested the widely held belief that there are two billion people globally suffering with a micronutrient deficiency is likely to be a “major underestimate”.

Among measures identified by GAIN and MNF to address the problem were fortification of food with vitamins and minerals, and supplementation programmes targeting pregnant women and young children.

Cynthia Rousselot, IADSA’s Director of Technical & Regulatory Affairs, commented: “The significance of this review cannot be overstated. It indicates that micronutrient deficiencies are more widespread than we originally feared. Malnutrition can result in health and developmental problems and reduced educational outcomes. It is up to all of us to find ways to address this hidden hunger, including better integration of supplement programmes into nutrition and health policy.”

Probiotic found to support bone density in older women

Supplementation with a probiotic may help to support older women’s bone health, according to the results of a new study.

Writing in the journal, *Biofilms and Microbiomes*, it was found that one-year supplementation with *Lactobacillus reuteri* ATCC PTA 6475 counteracts a degradation of gut microbiota in older women with low bone mineral density.

In the randomised controlled trial to investigate the mechanisms underlying the effect of *L. reuteri* ATCC PTA 6475 on bone metabolism, 20 women with the highest changes (good responders) and the lowest changes (poor responders) in tibia total volumetric BMD after one-year supplementation were selected from a previous RCT. In the current study, the team characterised the gut microbiome composition and function, as well as serum metabolome in good responders and poor responders to the probiotic treatment as a secondary analysis.

They reported that although there were no significant differences in the microbial composition at high taxonomic levels, gene richness of the gut microbiota was significantly higher and inflammatory state was improved in the good responders at the end of the 12-month daily supplementation. Moreover, detrimental changes, including the enrichment of *E. coli* and its biofilm formation observed in the poor responders were alleviated in the good responders by the treatment.

“Our results indicate that *L. reuteri* ATCC PTA 6475 supplementation has the potential to prevent a deterioration of the gut microbiota and inflammatory status in elderly women with low bone mineral density, which might have beneficial effects on bone metabolism,” they concluded.



Carnitine intake linked to better postnatal growth



New research from the University of Eastern Finland and Kuopio University Hospital has suggested that carnitine intake in the first postnatal weeks promotes better growth and larger brain size at term equivalent age in very preterm babies.

Published in the journal, *Nutrients*, researchers explained how carnitine is

both obtained from nutrition and produced by the body. In preterm infants, the main sources of carnitine are breast milk and infant formulae containing carnitine. Very preterm infants have an increased risk for developing carnitine deficiency

"Very preterm infants born before 32 weeks of gestation are at risk of developing carnitine deficiency due to limited tissue stores, immature endogenous synthesis, and insufficient intake from nutrition. Due to rapid growth, they also have an increased need for carnitine," explained Postdoctoral Researcher, Suvi Manninen, of the University of Eastern Finland.

In this new study, the researchers measured the carnitine levels of preterm infants at three time points and calculated the intake of nutrients, including carnitine, over the first five postnatal weeks. The researchers examined the associations of serum carnitine levels and nutrition with the growth of weight, length and head circumference, as well as brain diameters determined by magnetic resonance imaging.

The intake of carnitine, and free carnitine and short-chain acylcarnitine concentrations in serum, were associated with the growth of preterm infants and with cerebellar size in particular. In addition to these associations, dietary carnitine was found to correlate with free carnitine and short-chain acylcarnitine concentrations in serum, suggesting that these carnitine levels can be considered markers of carnitine intake.

The researchers concluded that further research is still needed on whether carnitine supplementation is necessary during prolonged parenteral nutrition and, on the other hand, whether breast milk should be enriched with carnitine in some situations in the dietary treatment of preterm infants."

Study reveals overweight women most likely to suffer long Covid

Researchers have revealed that women who are overweight are the most likely to experience symptoms of long Covid.

The study at the University of East Anglia is described as one of the largest studies on long Covid in the UK, and shows that having a higher BMI is linked with the condition, and that women are more likely to experience long Covid than men.

The research also shows that people with long Covid are much more likely to need additional, and often lasting, NHS care than those who make a swift recovery.

Prof Vassilios Vassiliou, from UEA's Norwich Medical School, explained: "Long Covid is a complex condition that develops during or after having Covid, and it is classified as such when symptoms continue for more than 12 weeks. Just over two million people in the UK are thought to suffer with long Covid and it affects people in different ways. We wanted to find out what factors might make people more or less susceptible to developing long Covid."

The research team surveyed patients in Norfolk who had received a positive Covid PCR test result in 2020. A total of 1,487 people took part in an online survey, which covered long Covid symptoms,

such as breathlessness, chest pain, fatigue, memory problems, and anxiety.

They found that more than half of the participants (774) were experiencing at least one long Covid symptom, showing a high self-reported prevalence.

Next, they looked to see what factors might make people more or less likely to suffer with the condition by looking at the participants' medical records. Factors including BMI, sex, medication use, other health conditions, and whether they lived in a deprived area, were all taken into account.

Professor Vassiliou added: "Interestingly, we found that more women than men had long Covid symptoms. We also found that having a higher BMI was linked with long Covid. This is really important because information like this can be used to profile those people who are 'at risk' of developing long Covid.

"We also found that people with long Covid were over three times more likely to use healthcare services than those who didn't display long Covid symptoms. We hope that our work will help policymakers plan local services and also inform the wider public of the scale of the long Covid pandemic."

The study was published in the journal, *PLOS Global Public Health*.

Vitamin D deficiency increases risk of bacterial vaginosis in pregnancy



A new study has concluded that vitamin D deficiency increases the risk of bacterial vaginosis during pregnancy.

The researchers, writing in the *Frontiers in Nutrition* journal, explained that bacterial vaginosis (BV) is the most common microbiological syndrome in

women of childbearing age, causing numerous adverse health issues in pregnant women. Several observational studies have discussed the association between vitamin D deficiency and the risk of BV during pregnancy, but the results were inconclusive. Therefore, this latest meta-analysis aimed to explore the association between vitamin D

deficiency and BV risk in pregnant women.

A total of 14 studies from 13 articles including 4,793 participants were eligible for this meta-analysis. The outcome showed that vitamin D deficiency may increase the risk of BV during pregnancy by 54 per cent. In subgroup analyses, positive associations were also found in studies that were conducted in black women, focused on the first trimester of pregnancy, of high quality, and adjusted for confounders. Sensitivity analysis reported that BV risk during pregnancy resulting from vitamin D deficiency increased by 157 per cent when removing the first two high-weight studies.

"This meta-analysis showed that vitamin D deficiency is positively associated with the risk of BV during pregnancy. Further high-quality prospective cohort studies are needed to determine whether vitamin D intake reduces the prevalence of BV in pregnant women," the researchers concluded.



New to market

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



Vitamin D3 for Viridian

Vitamin D3 Spray is the latest launch from supplement brand, Viridian Nutrition.

The ethical vitamin company has expanded its Vitamin D range with the launch of the new liquid D3 spray.

Vitamin D3 Spray is a unique, great tasting way to get a high potency dose of vitamin D3. Formulated to provide an optimal dose, two sprays daily provide a 2000IU dose of vitamin D3. It contains no artificial preservatives, flavours or additives.

The latest innovation brings Viridian's vegan Vitamin D range to now span seven supplements in capsule and liquid format.

Whereas most vitamin D3 supplements on the market are derived from the lanolin in sheep's wool, Viridian's Vitamin D3 Spray is suitable for vegans and provides vitamin D in a plant-based form derived from lichen.

Formulated by qualified nutritionists and ethically sourced, each bottle contains 20ml, equivalent to 70 doses. The vitamin D is preserved in MCT oil from coconuts.

Like all Viridian supplements, Vitamin D Spray is nutritionist formulated with 100 per cent active ingredients. Ingredients are sustainably sourced, non-GMO, palm-oil free and non-animal tested.

FEMALE SUPPORT FROM CYTOPLAN

A new female specific probiotic has been developed by supplement brand, CytoPlan.

Women's Biotic is described as a high-quality probiotic specially formulated to provide specific support for the gut, vaginal and urinary microbiome.

The multi-strain targeted formula is ideal for women of all ages and contains nine strains of live probiotic bacteria, including the highly researched strain, *Lactobacillus helveticus*, which has research attesting to its efficacy in female health issues. Each capsule will provide a culture of 3.5bn live bacteria.

Women's Biotic has been created with GUARD (Gut Acid Resistant Delivery) technology, a patented,

innovative and natural technology which protects the bacterial strains from stomach acid and enables the timed release of probiotics within the intestines. This maximises the probiotic efficacy at the ideal site of action in the body.

Containing pure and naturally fermented strains of antibiotic-resistant bacteria that are able to survive the challenges of the GI tract, including stomach acid and suitable for vegetarians and children from four-years-old, Women's Biotic also works well alongside other supportive formulas for sleep, mood, immunity and the prevention of infection. It is also stable at room temperature, with no need for refrigeration.



Nootropics brand added to growing Kinetic portfolio

Mindscopic is the latest range to join the portfolio at the distributor, Kinetic.

The brand is said to develop the purest quality science-based nootropic supplements to support both mind and body, allowing a healthy and energetic lifestyle for everyone.

With science-based formulas, the brand works with three labs in Belgium, The Netherlands and Germany, and uses natural plant-based ingredients in 100 per cent vegan capsules, GMO-free, with no artificial flavours or colours and made in a GMP-certified production facility.

Products in the range includes CLEAR FOCUS, an award-winning nootropic designed to contribute to memory function, learning performance and concentration. Formulated with pantothenic acid, which contributes to normal mental performance, and other ingredients for focus, memory, motivation and mental clarity, including CDP-Cholin, bacopa monnieri, and L-theanine.

Also in the range is CLEAR FOCUS CAFFEINE FREE and includes lion's mane extract, L-tyrosine and rhodiola. There is also MOODMASTER, and VIVE VITAE, a spray supplement designed to stimulate cell regeneration and slow cell degeneration.

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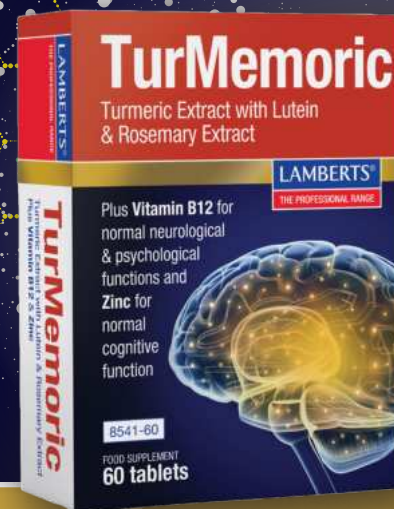


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IHCAN CONFERENCES 2023 UNVEILED

Discover what lies ahead for next year's IHCAN Conference series.



Following this year's sell-out series, IHCAN educational events return for 2023, and we've already secured some of the biggest names in integrative health, functional medicine and nutritional therapy to take centre stage.

With in-person and virtual events continuing, we've made our CPD schedule a lot simpler: IHCAN Conferences will be the brand for our online education, and there will be two IHCAN Summits signifying our in-person events.

Georgia Barnes, Event Manager for Target Publishing, which organises the educational offering, explained: "We want to thank the thousands of *Nutrition I-Mag* readers who joined us in 2022 and as we look ahead to 2023, we're focused on securing another set of top-class integrative health speakers from across the world, covering everything from cancer to autoimmunity.

"IHCAN events have remained synonymous with high-quality education, in the right environment at the right price – next year's events will be no different."



FOR 2023...

Get these dates in your diary for the event schedule next year:

- **Saturday, April 22** – Virtual IHCAN Conference.
- **Saturday, June 24** – IHCAN Summit, 155 Bishopsgate, London.
- **Saturday, September 9** – Virtual IHCAN Conference.
- **Saturday, November 18** – IHCAN Summit, 155 Bishopsgate, London.



DR LEO PRUIMBOOM



DR JESS ARMINE



DR KEESHA EWERS



MARY BETH GONZALEZ

We're hugely excited to welcome, live at the June Summit, Mary Beth Gonzalez and Professor Sarper Diler, from The Nicholas Gonzalez Foundation. While commercial medicine still flounders around the treatment of cancer, the late Dr Nicholas Gonzalez developed a protocol that succeeds, to this day, in bringing cancer patients – even those with pancreatic cancer – into long-term remission. The foundation presents research and educational information about The Gonzalez Protocol, Nick's personalised nutritional enzyme treatment.

Professor Sarper Diler, MD, PhD, CHTC, D-Hom, IO is a Certified Gonzalez Protocol Doctor and chairs the Scientific Advisory Board of the foundation. He acts as the secretary and Board Member of the Lymphoma Association (LC) and runs preclinical and clinical trials on cancer, autonomic nervous system clinical interferences, epigenetics, and gut-heart-brain axis coherence. He continues research, clinical and educational work as a faculty member of Istanbul University Istanbul Medical Faculty, co-chairing the OVITAL Institute.

Next year's unique program of events will also include autoimmunity and women's health expert,

Dr Keesha Ewers, PhD, board certified in functional medicine and Ayurvedic medicine, and founder and medical director of the Academy for Integrative Medicine Health Coach Certification Program.

Author of *Solving the Autoimmune Puzzle*, she conducted the 2013 HURT study (Healing Un-Resolved Trauma) and developed the HURT Model for understanding how past childhood trauma impacts adult health. We will also welcome the massively entertaining Dr Leo Pruimboom, PhD, University of Groningen, faculty of medicine, founder of clinical psychoneuroimmunology and the 'intermittent living' concept.

Dr Jess Armine will also be speaking and is one of the few health care practitioners worldwide specialising in correlating the Genetic Data with Neuro-Endo-Immunology, Mitochondrial Dysfunction and Cell Wall Integrity to find hidden imbalances. He lectures practitioners in the USA, UK, and Australia and he treats patients worldwide.

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A DETOX PROTOCOL

While faddy and restrictive diets can dominate people's agenda in the New Year, educating clients of the need for a more longer-term, nutrition-led programme is key. Here, our panel of experts discuss the best protocols to consider.



Fatigue, sluggishness, poor digestive function, brain fog, and lack of quality sleep are among the common signs that our body systems are overloaded and in need of a cleanse. But how best to advise clients on this is important to consider so that you avoid falling into the faddy detox season that typically dominates January.

The fact is most people could do with some kind of cleanse plan, given the toxic overload modern living can cause. But doing this correctly, so it is safe and effective, and that clients learn about the nutritional foundations to avoid becoming so overloaded, is critical.

Rose Holmes, Nutritionist and Education and Training Manager at Rio Health, commented: "Cleansing and detoxing are actually different (but connected aspects of health revitalisation). Cleansing typically refers to digestive health; detoxing is more about removing toxins from all over the body, particularly releasing toxins from the liver, lymph, and all body cells. It is best to cleanse (and promote good digestive function) before detoxing (promoting the shifting of toxins out of the body). A cleanse and detox can help kickstart weight loss, help fight cravings, and, most importantly, reduce levels of inflammation in the body. A cleanse and detox can help energise, improve mental clarity, improve mood and promote healthy, clear skin."

Sara Gibbons Nutritionist at Good Health Naturally, highlighted why we may need to consider a detox in the first place.

"In our modern living environment, it is impossible to avoid at least some toxins while going about our everyday life. For example, walking down the road, we are exposed to vehicle fumes. In the countryside, we can be exposed to farming chemicals, whilst chemicals in the home and indoor environments are common from paint, carpets, cleaning products and even everyday objects," she commented.

"Whilst a healthy body can handle a certain amount of toxicity, there can be physical and mental health problems when it gets overloaded. Stress is also a common factor in modern-day living. It is responsible for many issues because it depletes the body of nutrients and makes it more vulnerable to toxicity. Taking time out of the regular routine to cleanse and nourish is therefore going to be beneficial for many people."

Sophie Barrett, Mycotherapy Advisor at Hifas da Terra, continued: "A diet of processed foods, smoking, stress, pesticides, pollution, city-living, all increase toxic overload. The body is unable to neutralise or eliminate toxins effectively, when stressed."

TOXIC OVERLOAD, LONG-TERM

To understand the effects of being constantly overloaded with toxins, it's critical to be better aware of the longer-term health impacts that people can be at increased risk of.

"Toxins are substances that can harm a living organism to a lesser or greater extent. The accumulation of toxins over a prolonged period can lead to serious chronic problems and even acute diseases, including cancer as well as poor liver and kidney function, susceptibility to auto-immune conditions, etc," Barrett commented.

"There are different types of toxins; those of endogenous origin created due to normal metabolism itself and those of exogenous origin from exposure. Some of these exogenous toxins include pesticides such as organochlorines (which are banned in the US), chlorpyrifos, polychlorobenzenes, heavy metals such as mercury, cadmium and lead, amongst others.

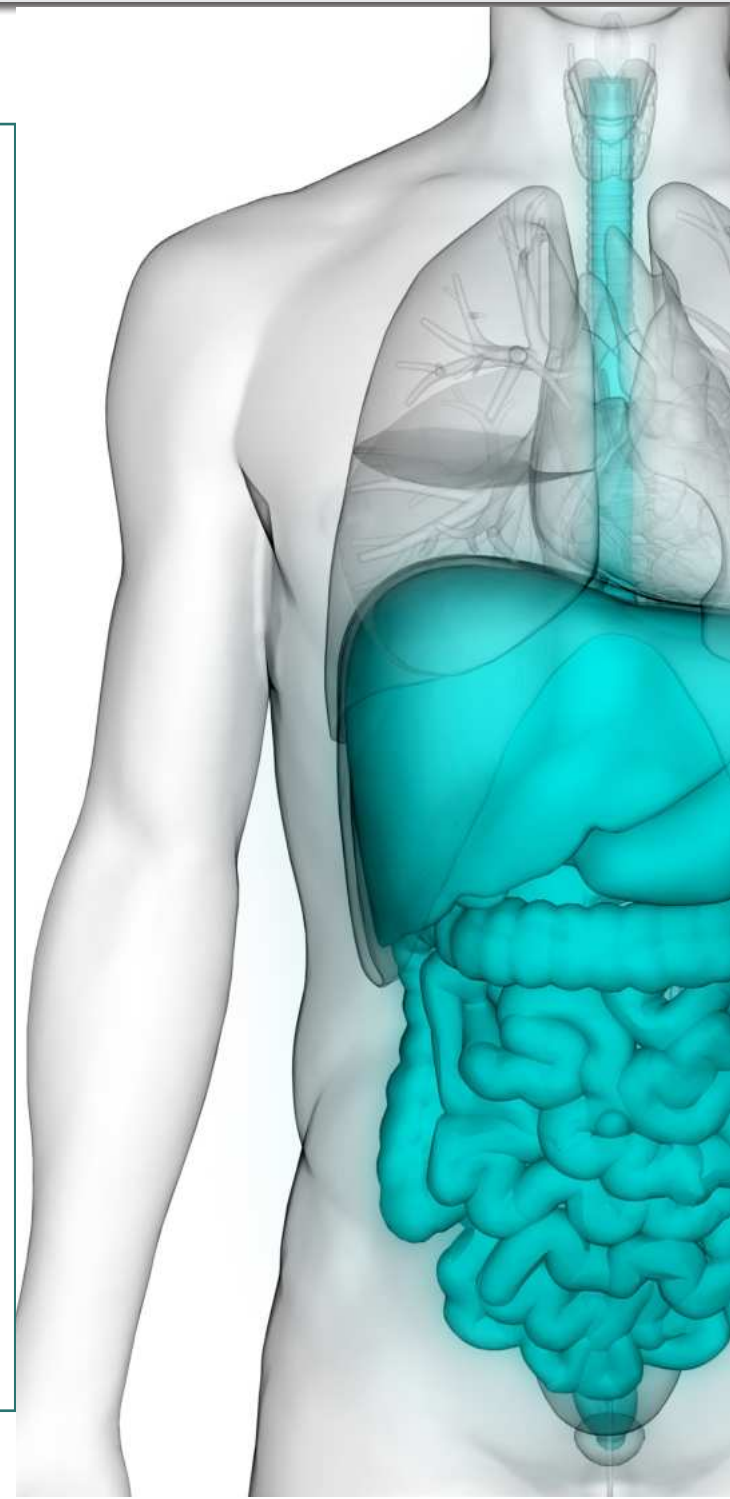
"Of the pesticides registered safe for food use, 37 of these are neurotoxic. The urine values of TCP (a chlorpyrifos metabolite) are detectable in approximately 82 per cent of adults and in 92 per cent of children. The harmful effects of heavy metal toxicity include vision alterations, learning and language disorders, alterations of synaptic transmission and neurotransmitters, such as dopamine, acetylcholine, serotonin and norepinephrine, memory disorders, hyperactivity, and attention disorders."

Gibbons went on: "Our cells are always working towards optimum health. It's how they are programmed to function. Healthy cells mean healthy tissues, organs, blood and then, of course, a healthy body. Only two factors stop cells from working well: a lack of the nutritional resources needed to do their job and toxicity that interferes with their processes. If the cells aren't working correctly, if they can't function optimally, then health issues can and will arise. These can begin as mild issues and symptoms.

"However, if the situation continues long-term, chronic health problems can arise as the body struggles to fulfil all its functions, given that it can no longer operate optimally and has to choose priorities. How that chronic response manifests will vary from person to person, but providing optimum nutrition and cleansing of toxicity is an excellent place to start."

Important to note is the signs someone may be exhibiting if they are experiencing toxic load.

Gibbons advised: "This can vary hugely, but common mild indications could be feeling sluggish, headaches, a tendency to infections, sleeping a lot, feelings of heaviness, dull skin etc., through to more severe symptoms of illness."





DESIGNING A DETOX

When it comes to building a plan for your client, this will naturally involve an individualised approach depending on their needs and goals. But there are some basics to apply.

Gibbons advised: "In Traditional Chinese Medicine, good times to cleanse are often considered the spring to clear debris after the winter months and autumn to prepare the body for the rigours and heavier foods of winter. However, you can begin your cleansing journey at any time it's felt to be needed. When doing any cleanse programme, it is always important to drink plenty of pure water throughout the day to help flush any released toxins out of the system as quickly as possible. It is also important to ensure the bowels move thoroughly daily, as toxicity in the colon can mean feeling overwhelmed, headachy and nauseous. Some people utilise colonics or enemas to counter this, and the relief can be immediate!

"The benefits include more energy, clearer skin and eyes, greater mental clarity, a greater sense of wellbeing and potentially a reduction of health symptoms. It's important to emphasise if you have not done a detox programme before, it is best to begin gradually and seek professional advice if you have any health concerns."

Looking at the specifics of a plan, Holmes suggested: "Begin with a cleanse to promote optimal digestive function and ensure elimination channels are open for the safe transport of toxins out of the body. Once all elimination channels are open, promoting the mobilisation of toxins out of the body can be more effective. It is particularly important to start weight loss efforts with a cleanse and to support detoxification because many toxins are fat-soluble and store in fat cells, thus causing weight gain."

Barrett went on: "Every individual's ability to detox and cleanse effectively will be different, that's why it is important to prepare accordingly and work with a nutritionist or naturopathic practitioner. If someone

is taking certain medications, these also need to be carefully considered – a detox might not be right for them."

If we look at the foods that should receive focus, it is the antioxidant-rich, green, superfood types that are most effective.

"Chlorophyll-rich foods like parsley, kale, and green barley grass juice are excellent additions to cleanses and detoxes. Chlorophyll is what makes plants green and healthy. The beneficial properties of chlorophyll are many, including stimulating bowel function, helping reduce weight, and aiding removal of harmful toxins from the body, alongside other benefits such as lowering blood pressure and cholesterol, giving protection against carcinogens, and strengthening the immune system," Holmes suggested.

Gibbons also advised: "There are many ways to cleanse and clean the body, but one of the best is to flood the body with nutrition in the form of organic juices and smoothies. This might seem counterintuitive as this doesn't involve fasting or starving the body, but instead, giving plenty of nourishment in a form that is easy to digest and thus giving the body plenty of resources to do what it does best, which is organising its healing and repair. Another powerful cleansing support that many advocate is fresh celery juice on an empty stomach first thing in the morning, followed by a clean diet of vegetables and fruit.

"Whilst cleansing, it's essential to avoid white goods, such as white rice, flour, sugar or chemical table salt as these will affect and even halt the process. Dried fruits such as figs and dates can help to clean the colon. The liver is also an essential detoxing organ, therefore, taking supportive herbs and limiting fat to later in the day will help increase its detoxing capacity.

"When you give your body pure nutrition, the additional resources available enable a cleansing and clearing effect to occur, so both toxicity and

deficiency can be addressed simultaneously. This is why a diet comprising a wide range of fresh, ideally organic, vegetable and fruit juices and smoothies can be so effective. In addition, giving the body plenty of nutrients enables the cells to remove debris and toxic matter.

"Some beneficial fruits and vegetables include apples for their antioxidant effects, asparagus for its high levels of glutathione, and beetroot for its high folate levels when raw and its high antioxidant levels. Carrots are also high in antioxidants and support the elimination organs of the lungs, colon, kidneys, bladder, liver and skin. Ginger is antibacterial, antiviral, antiparasitic and also an antioxidant. Warm lemon water helps flush toxins from the body and can also help dissolve uric acid."

You also need to ensure other factors are built into any protocol to support dietary changes.

"Sometimes, people feel tired, headachy or emotional as the body clears old habits and patterns simultaneously as physical toxins. Others can feel benefits straightaway. To counter any side effects, drink plenty of water and consider a natural supplement to keep the digestive system moving well. Some gentle exercise stimulates the lymph system, helping move the toxins out faster. Walking in nature can be particularly beneficial," Gibbons suggested.

"Finally, taking time to rest allows the body to fully use the extra resources to do what it needs to do to move towards more optimal health. Therefore, a deep cleanse is ideally best not undertaken during a hectic period unless the need is critical."

Barrett recommended: "A digital detox, time away from cell phones, WiFi and computers, gentle exercise daily, the right breathwork and movement is key. Infrared saunas and essential oil steams can also be useful."

Holmes added: "Exercise and movement are also important – these can aid the lymphatic clearance of waste and toxins."





BUILDING A PROTOCOL

In addition to key dietary shifts, bridging nutrient gaps and adding in supplements to support cleansing and detoxing will be important, again, depending on the client need.

Holmes suggested: "A cleanse can best be supported by using supplements that both flush the system and help it to function better. Look for a supplement that contains ingredients like psyllium husk (which contain polysaccharides that form into a gel in the intestines and lubricate stool contents, producing a laxative effect), probiotics like *Lactobacillus acidophilus* (to replenish beneficial bacteria to the gut), electrolytes (like potassium and magnesium, to rebalance), cornsilk (which soothes and relaxes the lining of urinary system), aloe vera (to help regulate elimination cycles), and blessed thistle (which decreases flatulence).

"Alongside these cleansing ingredients, L-glutamine is useful to help decrease intestinal permeability and enhance absorption of nutrients; curcumin is liver protectant and has digestive tonic effect, as well as providing antioxidant and anti-inflammatory activity; and *Cistus incanus* usefully aids breakdown of biofilms (protective coatings on bacteria and fungi like *Candida*) in preparation for removing these micro-organisms from the digestive tract.

"Detoxing can be supported with one of, or a combination of, the following: Manayupa (aka burbur, which is a blood cleanser, detoxifier and urinary tract cleanser), cilantro (which supports natural detoxification processes, has chelation effect, and protects the liver), *Chondracanthus chamissoi* (an edible seaweed, which promotes mobilisation of toxic heavy metals out of the body), and chlorophyll-containing parsley (which detoxifies and stimulates digestion).

"Chlorella and barley grass are also chlorophyll-rich. Chlorophyll is what makes plants green and healthy. The beneficial properties of chlorophyll are

many, including stimulating bowel function, helping reduce weight, and aiding removal of harmful toxins from the body, alongside other benefits, such as lowering blood pressure and cholesterol, giving protection against carcinogens, and strengthening the immune system. For all these benefits, look for a spray-dried juice extract that preserves the beneficial naturally-occurring enzymes in live and active state."

She also suggested: "It is also important to support lymphatic flow during detoxes. The lymphatic system has an important role in transporting waste from the body. The lymphatic system can become overwhelmed with toxic debris. Sluggish lymph is a breeding ground for infection, with stagnant lymph interfering with other body systems. Supplements that support healthy lymphatic flow include manayupa, red root (*Ceanothus americanus*), Japanese knotweed (*Polygonum cuspidatum*) and gotu kola (*Centella asiatica*)."

Meanwhile, Gibbons recommended: "The cleansing process, particularly enemas and colonics, can imbalance the gut microbiome and its healthy bacteria while removing the unhealthy bacteria, so plenty of good quality probiotics are essential alongside vitamin D3 to help bring it back into balance. Magnesium chloride flake baths or footbaths help release and pull out more toxins, and many people find them to be a soothing and nurturing part of cleansing. Furthermore, absorbing plenty of magnesium into the cells has also been shown to protect them from toxicity.

"Bentonite clay baths or footbaths are also an excellent way of pulling out harmful substances such as heavy metals and other environmental pollutants. Supplementing with a good glutathione product is also helpful as this master antioxidant is a significant resource for the liver in its functions as a critical detox organ. It can also be beneficial to support the liver with milk thistle tincture."



MEDICINAL MUSHROOMS

A key product area you could recommend to aid in detoxing is medicinal mushrooms, which boast a rich nutrient profile.

Barrett commented: "Medicinal mushrooms are high in antioxidants with vital chelating and hepatoprotective properties. It has been shown that maitake extract increases the clearance of heavy metals, such as mercury, in vivo and in vitro by about 56 per cent. It increases the elimination of mercury from kidneys and liver to more than 2,3-dimercapto-1-propanesulfonic acid (DMPS) without its adverse effects. A decrease in blood mercury levels has been observed in both acute and chronic toxicity more rapidly compared to the control group in animals. In the acute case, it falls halfway to the second day, something that does not occur in the control group until the seventh day). Comparing with other fungi, it is the one with the highest activity of this type.

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

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

"The intake of *A. blazei* extract in animals has demonstrated the reduction of harmful effects during use and has been shown to increase antioxidant enzyme levels and normalise liver transaminases, which supports its use to detoxify and restore the liver. It also has ferric ion chelating activity."

And she continued: "Several studies have shown that *Polyporus spp.* has a diuretic capacity by regulating aquaporins, fundamentally increasing the excretion of sodium and chlorine ions. The dose with the greatest effect on excretion was 20mg/kg. A study in mice showed that, although the excretion of sodium and chlorine increased, the Na (+) / K (+) ratio was not affected."

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Questions around conception

With people leaving it later in life to start a family, many are turning to the support of practitioners to help increase their chances of conception. Here, *Nutrition I-Mag* brings you the data around fertility issues, and the role of nutritional and lifestyle interventions.



The data tells us that the fertility rate in the UK are rising; according to the Office for National Statistics (ONS), the total fertility rate (TFR) increased to 1.61 children per woman in 2021, from 1.58 in 2020. Furthermore, in England and Wales, there was an increase of 1.8 per cent in live births in 2021 compared to the year before, but still below the 2019 figure.

But that doesn't tell the whole story. The data also noted that the above figure remains in line with the long-term trend of decreasing live births seen before the Coronavirus pandemic. When looking in greater detail, it was noted that in 2021, the overall increase in fertility has been driven by women at older ages when compared to 2020, and indeed, those aged 35-39 saw fertility rates increase by five per cent. While this is encouraging in terms of the interventions that can help a woman fall pregnant, it confirms that the age of women starting a family is getting later.

And then we must look at the data around numbers of people struggling to conceive.

Alice Bradshaw, Head of Nutrition Education and Information at Terranova, explained: "With an estimated one in six couples finding it difficult to conceive, fertility issues are more common now than in recent history. According to the British Fertility Society, approximately 30 per cent of fertility problems are due to the woman, 30 per cent due to the man, and 30-40 per cent to both or to unknown causes.

"Although there are numerous physiological factors contributing to infertility, such as low sperm count, body weight imbalances, failure to ovulate and hormone imbalances, it is thought that our modern, fast paced living may also be affecting our ability to conceive. Eating on the run, lack of exercise, poor sleep and stress management and our over-reliance on technology are some factors that throw our bodies out of balance."

Rosie Rayner, Clinical Nutritional Therapist,



Naturopath and Iridologist, who works as part of the technical team at Bionutri, went on: "According to the NHS, 16 per cent of couples struggle to conceive annually. We know that sperm counts have more than halved since the 1970s, which interestingly coincides with the major increase in endocrine-disrupting hormones in the environment. Women are choosing to have children later on as well: since 2013, the average age of a first time mum has been over 30-years-old. The general population

are struggling with inflammation, metabolic syndrome and stress which all affect fertility. So, yes, conceiving is becoming more difficult for different reasons, including due to environmental, physical and societal changes."

Katy Grieshaber, Nutrition Advisor at Viridian Nutrition, continued: "Conception issues are an increasing problem within the UK. There are two forms of infertility: primary infertility and secondary infertility. Primary infertility is defined as a couple

who have never conceived a child and are facing difficulty. Secondary infertility is when a couple has had one or more pregnancies but are now facing issues. In the 21st century, the average age at which couples plan or conceive has increased compared to the 20th century. Therefore, it can be hypothesised that a postponement in childbearing and parenthood could be attributed to infertility through varying lifestyle changes, higher education, social progress, and the rise of effective contraception."

FERTILITY PROGRAMME

The point should be made to clients that there is no quick fix when it comes to fertility, and any protocol takes time and focus.

In terms of the expectation, Bradshaw explained: "Improving fertility needs patience and time. It is commonly suggested to follow dietary and lifestyle changes for a minimum of three months. If there are long-standing hormonal imbalances, it may take even longer."

Rayner added: "I always say to my clients that expectations need to be at around six months, sometimes more depending on the complexity of their health complaints. It takes over 100 days for the follicles in the ovaries to mature and 74 days for sperm. It also takes time to support micronutrient levels, detoxification pathways and most importantly, the client's habit changes such as

dietary or self-care."

Grieshaber went on: "The UK Government recommend that when you are trying to get pregnant, consume a 400ug folic acid supplement daily for 12 weeks to help improve your chances of fertility. However, every individual is different. Therefore, it is vital to ensure all nutritional levels remain high to help support and enhance the chances of fertility. Most couples will get pregnant within a year if they have regular sex and do not use contraception. There is an estimated 25-30 per cent chance of conceiving during each monthly cycle. However, it is known that women become less fertile as they get older, but the effect of age on men's fertility is less clear."

And there are some critical factors to educate clients on that could be affecting their fertility.

"Alcohol consumption is associated with low sperm count in men and a lower rate of conception in women. Xenoestrogens are environmental oestrogens that can make their way into food and water supplies. They can be found in tap water, food and drink stored in plastic, and pesticides and herbicides. These chemicals have been shown to disrupt endocrine and hormonal balance and possibly lead to fertility issues, such as sperm abnormalities and oestrogen imbalances," Bradshaw advised.

"A high caffeine intake is associated with reduced fertility, so couples should be mindful of their intake of coffee, green tea, soft drinks and chocolate. Avoiding dietary sources of free radicals, saturated fats and trans fats will also help to maximise fertility."

Looking in closer detail at the reasons behind conception issues, Grieshaber added: "Infertility can be due to a range of reasons, but for one in four couples, a cause cannot be identified. However, an influx of studies has emphasised the contribution that the 21st century lifestyle can play to infertility.

"The influencing lifestyle factors that have been ascribed are diet, physical activity, psychological stress, socioeconomic environment, cultural factors, BMI, smoking, alcohol, caffeine, and psychoactive substances. Infertility can also be influenced by each partner's genetics, age, medication, surgical history, exposure to environmental toxins and systemic diseases.

"Specifically, to women, infertility can be influenced by ovulation problems and the monthly release of an egg from the ovaries. Ovulation problems can originate from an egg struggling to be released or in frequencies of an egg being released in some cycles but not others. Ovulation problems could be a consequence of polycystic ovary syndrome (PCOS), thyroid

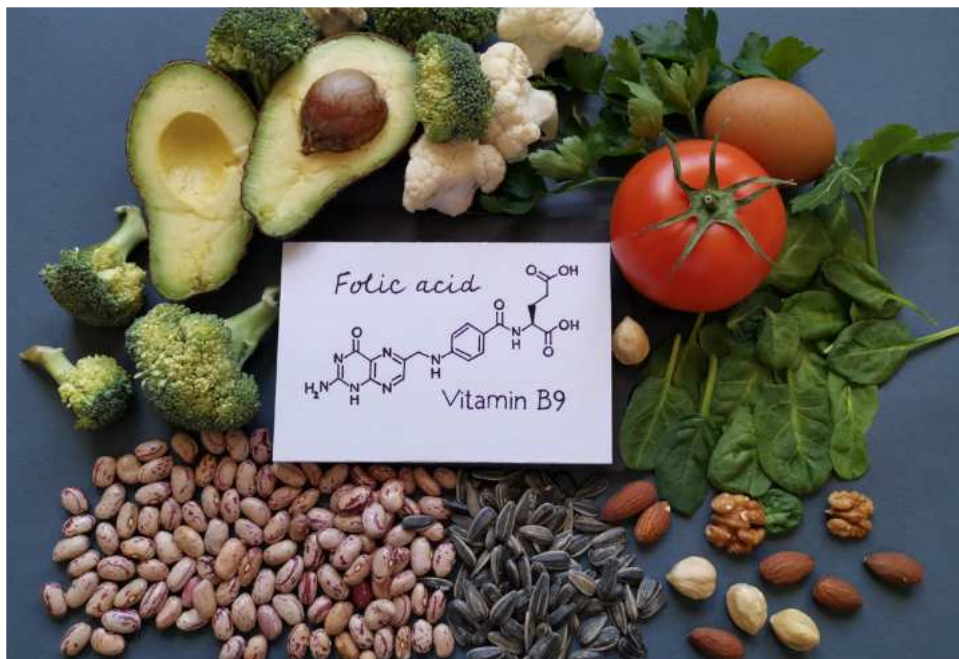
problems, premature ovarian failure, cervical mucus problems, endometriosis, or pelvic inflammatory disease.

"Regarding male infertility, the predominant common cause of infertility is abnormal semen. Abnormal semen could be due to a lack of sperm production, sperm not moving effectively or abnormal sperm movement. However, many cases of abnormal semen are unexplained. Another contributing factor is testicle health – if the testicles are damaged, this can contribute to the quality of semen. Some men experience ejaculation problems, which can prohibit conception."

Let's also factor in the impact stress can have.

"Modern day stress plays a huge role, it is the biggest driver that I see in my clinic. With longer working hours and burning the candle at both ends, increasing financial pressures, and modern day eating habits where there is limited time to make home-cooked nutritious meals, food is grabbed and often eaten on-the-go and in front of

a laptop. People are living with often high cortisol levels, which can directly disrupt sex hormone balance. All of these factors contribute to poorer fertility," Rayner advised.



IDENTIFYING DEFICIENCIES

Certain nutrients are absolutely critical for not only conception in the first place but for a healthy pregnancy. And it's imperative both the man and woman are involved in changes.

Bradshaw commented: "Both nutritional deficiencies and excesses can harm fertility. Overall energy intake needs to be balanced – i.e., too little or too many calories may have a detrimental effect on the reproductive system. Studies also show that refined carbohydrate consumption negatively affects reproduction, while deficiencies in omega 3 fatty acids, folic acid and vitamin D must be addressed.

"In studies, antioxidant nutrients, such as vitamin C and zinc, were found to be especially important and blood sugar imbalances and inflammation were issues that needed to be addressed to optimise fertility. Important nutrients are often lacking in the modern diet that is rich in refined and processed foods. Women who are in a perpetual calorie deficit to control their weight may also fall short of these essential nutrients."

She went on: "A Nutritional Therapist or other qualified expert can help to make specific supplement recommendations to couples with fertility issues, however, many nutrients have scientific validation for their role in fertility.

"Folate is an especially important nutrient that needs to be taken by the woman at least three months before attempting to conceive. It is known that folate is needed to prevent neural tube defects (such as spina bifida). Folate is also involved in the production of DNA and RNA in both the egg and sperm, so should be part of a supplement programme for men too. Other B vitamins are involved in conception and fertility (especially B6 and B12) and these can be found in a comprehensive prenatal formulation.

"Zinc is important for hormonal balance and a deficiency can lead to reduced fertility and an

increase in miscarriage. Omega 3 fatty acids are also essential for hormonal health, healthy inflammatory response and the ability to sustain a pregnancy. Healthy sperm quality and quantity is also dependant on adequate essential fatty acids.

"The antioxidant nutrient, selenium, is important for sperm formation and sperm count and to support a healthy pregnancy. Selenium is commonly paired with vitamin E, another antioxidant nutrient which has been shown in studies to support

fertility in both men and women. Other antioxidant nutrients, such as vitamin C and carotenoids, are also important to reproductive health. For men who have low sperm count and/or motility, the amino acids, L-arginine and L-carnitine, have been

shown to be especially helpful."

Rayner added: "I believe in personalised and integrative nutrition, so I don't think there is one specific protocol, it really depends on what is driving the client's fertility issues. Having said that though, I would usually include a good multi, which includes key micronutrients, alongside a fish/algae oil for omega 3. If there is an excess oestrogen picture, which often there is, SDG lignans can be very helpful, in fact, for any time during a women's reproductive life.

"Many people are in a pre-diabetic state so balancing blood sugar levels is a priority. Cinnamon and chromium can be helpful there. Supporting stress levels and regulating any inflammation are my other two top priorities. Also checking their thyroid function too is important for fertility too. There are many key micronutrients for fertility support, such

as B6, B9, B12, zinc, magnesium, vitamin D and omega 3 fish oil.

"Supporting the gut is crucial as well, we must make sure our clients are assimilating and excreting properly. I like to support the liver as it is pivotal in the metabolism of sex hormones. I do this with turmeric, dandelion root and choline, alongside microbiota support such as *L. plantarum*, *L. acidophilus* and *L. bulgaricus*."

Noting the importance of supplements, Frank

Brogan, Senior Nutritionist at Pharma Nord, advised:

"Supplementation can play a meaningful role in fertility, though it needs to be appropriate. It's also crucial that if taking marine supplements such as fish oil (for omega 3 fatty acids) that they are adequately

screened for endocrine-disrupting chemicals, such as heavy metals, dioxins and PCBs.

"Correcting nutritional deficiencies that would be difficult to do via dietary means should be the priority. Antioxidant compounds can also be quite helpful, considering oxidative stress is a major environmental hazard that can prove deleterious to normal gamete health. Selenium-yeast supplementation and coenzyme Q10 are two prime examples."

And Grieshaber commented: "It is essential for a supplement plan to be followed alongside dietary and lifestyle protocols. These supplementary plans differ from male to female, but omega 3 is regarded as an essential nutrient during fertility for hormone regulation and sperm quality. With a lack of male fertility products on the market, it is recommended to opt for a supplement with

nutrients to promote conception.

"These essential nutrients include vitamin E to improve the function of spermatozoa to enhance the sperm's ability to penetrate the egg, L-carnitine is involved in the successful maturation of sperm ad sperm mobility, the amino acid, L-arginine, is required for the replication of cells, zinc is involved in all aspects of male reproduction from hormone metabolism, sperm formation, and sperm motility, vitamin C and selenium are essential for sperm mobility, production, quality and motility and morphology, and folic acid, which is essential for DNA production and repair.

"The most fundamental supplement for female fertility is folic acid and vitamin B12. Folic acid and vitamin B12 are components required for the synthesis process of DNA, cysteine, methionine, and the transfer process of RNA. Women are encouraged by the Government to supplement with folic acid during pre-conception to prevent neural tube defects. It is equally important to ensure all nutritional levels are maintained. Therefore, a supplement which combines the following vital nutrients is crucial.

"These nutrients are DHA, an important omega 3 fatty acid crucial for cellular health and hormonal regulation, chromium and alpha lipoic have proven effective at increasing insulin sensitivity in women with PCOS, vitamin A is vital for assisting cellular growth and differentiation, for embryo and placenta development, and improving the integrity of epithelial tissue and cilia lining the fallopian tubes, vitamin E for maintenance of ovary health and improving regulation of hormone activity, iron is fundamental for red blood cell formation, transport of oxygen to tissues, nucleic acid metabolism and acting as a cofactor for many enzyme reactions, vitamin C to protect folic acid and vitamin E from oxidation, and iodine to regulate the development of the foetal brain and nervous system."



A BALANCED DIET

When it comes to specifics, dietary recommendations are varied, with Rayner suggesting: "I aim at increasing nutrient-dense foods. Increasing the variety of fruits and vegetables (eight-plus per day), which will increase the phytonutrient profile and act against oxidative stress and inflammation. Opting for complex carbohydrates, which include fibre and the very important starch, needed for ovulation. Increase protein to help support blood sugar levels, especially at breakfast and increase good fats, such as oily fish, olive oil and from seeds and nuts. I am a big believer in eating what is local and in season; they generally have more phytonutrients, less processing and have lower pesticide residue too.

"Limiting foods that under-nourish or overstimulate is important. Being realistic is imperative though, as you need your client to be compliant. I aim at what they can have, not what they can't. Generally though, avoiding ultra-processed foods, opting for foods and products with the least processing and ingredients, alongside limiting dairy, wheat, refined/added sugar, alcohol and caffeine is often a gamechanger."

Grieshaber also pointed out: "Diet and nutritional patterns have an undoubtedly significant role in male and female fertility, thus, it is worth ensuring a healthy diet and lifestyle to prevent infertility. A healthy and balanced diet is vital for women as nutritional content can contribute to regular ovulation and function. It has been established that women planning



parenthood should be supplementing folic acid and vitamin D from childbearing age. Folic acid is vital for a healthy pregnancy. All women of reproductive age are recommended to consume 400ug of folic acid each day, in addition to consuming food with folate from a varied diet, to help prevent some major birth defects of the baby's brain and spine (known as neural tube defects).

"Before conception, increasing protein intake may improve carbohydrate-insulin balance, which seems to be important in treating infertility due to a lack of ovulation that some women may endure.

"Research investigated the importance of following a Mediterranean diet if planning to conceive. A Mediterranean diet is rich in dietary fibre, omega 3 fatty acids, plant-based protein, and vitamins and minerals, which have been proved to support male and female fertility. Fertility can be accomplished through the consumption of fruits and vegetables, olive oil, unrefined carbohydrates, low-fat dairy and poultry, and oily fish, which are characteristics of the Mediterranean diet. The qualities of a Mediterranean diet support individuals to obtain the required nutrients to ensure the best chance of conception.

"As discussed, diet and lifestyle play a large contributing role in fertility. Therefore, consuming a diet high in red and processed meats, highly-process carbohydrates, and foods high in fat, sugar, and salt may be detrimental to reproductive health and fertility."



Brain health encompasses such a collection of issues, ranging from one of the different forms of dementia (known to be on the rise) at one end of the scale, through to brain fog at the other end, something we have seen become a greater problem in a post-Covid world.

While there are many conditions and issues related to cognitive decline, we know the foundations are critical no matter what, even with older age. This includes a good nutrition plan, incorporating healthy diet and supplements, brain exercise, and healthy lifestyle. Yet these are all factors that can be lacking in our modern way of living.

Helen Drake, Registered Nutritional Therapist at Cytoplan, commented: "Cognitive problems are a big concern as they can contribute to other conditions, further cognitive decline and poor health, as well as socioeconomic issues. It is thought that more people are experiencing poor mental health and a recent Government report showed that there was an increase in the number of people sectioned under the mental health act in 2021 compared to the previous year. Dementia has also been steadily rising and recently, Alzheimer's disease became the leading cause of death in the UK.

"Cognitive issues are common as they can range from mild brain fog to dementia, including Alzheimer's disease. Many common issues seen clinically include anxiety, low mood and poor sleep, as well as problems with brain fog and concentration. These can be a sign that cognitive function is under stress, and it is important to address them as early as possible to avoid further problems later in life."

Catherine Gorman, Nutritionist at Good Health Naturally, also pointed out: "In 2015, dementia overtook heart disease and stroke as the UK's biggest cause of death."

Keri Briggs, Senior Nutrition Advisor at Lamberts, added: "Other significant cognitive issues include dementia, which currently affects 944,000 people in the UK, and Parkinson's disease, which affects 145,000 people. Both conditions are on the increase, due in part to better diagnosis and partially due to an increasingly ageing population: dementia cases have increased by 56 per cent between 2010/11 and 2015/6 and are set to be in excess of one million cases by 2030 and 1.6m by 2050. Parkinson's cases

are predicted to increase to 172,000 by 2030. These figures are of concern firstly as the current cost of dementia care is £34.7bn, which is likely to rise £94.1bn by 2050. More important is the human cost, both to those affected even with MCI and to those around them."

Isabelle Nunn, Head Nutritionist at Kinetic, which has the Garden of Life and Nature's Answer brands, agreed that cognitive conditions and disorders are of "great concern these days".

She added: "Globally, the number of people living with dementia is on the increase from 46.8m back in 2015 to 131.5m predicted in 2050, resulting in a 281 per cent increase. In the UK, there are currently 850,000 people estimated to be living with dementia. As expected, these numbers are also predicted to rise. So, although we know a person's risk of developing dementia rises from one in 14 over the age of 65, to one in six over the age of 80, we should look into factors which contribute to dementia and what we can do to help prevent its onset."

Sophie Barrett, Mycotherapy Advisor at Hifas da Terr UK, pointed out: "There are around 55m cases worldwide of dementia and this number is expected to rise to 78m in 2030 and 139m in 2050 (WHO). Dementia is a term used to describe a group of symptoms that affect memory, thinking and social skills and are severe enough to interfere with your daily life. It is not a specific disease, but there are several diseases that can cause dementia, the most representative of which is Alzheimer's disease, frontotemporal dementia (or Pick's disease) and Lewy body dementia.

"Alzheimer's disease is the most common form of dementia and, according to the WHO, accounts for 60-70 per cent of cases. It is a progressive neurological disorder that involves a steady decline in thinking, behaviour and social skills that affects a person's ability to live independently. In a post-Covid world, individuals experiencing brain fog, lack of focus and concentration, as well as increased stress, have been on the rise. We know that oxidative stress and altered antioxidant systems can play an important role in cognitive decline."



MANAGING RISK

Age is a major factor in brain decline, but that is not all that's involved and, importantly, there are a range of modifiable risk factors.

Alice Bradshaw, Head of Nutrition Education and Information at Terranova, pointed out: "Diet, lifestyle, stress management and gut health are the foundation to supporting brain function and there are lots of simple strategies that can be adopted, regardless of age or health status. A healthy gut is vital for cognitive function and imbalances in the gut microbiome can produce inflammation, which alters brain function. Other health factors which compromise brain health include insulin resistance, decline in hormone levels, elevated homocysteine levels and oxidative stress."

Briggs added: "A certain amount of decline in memory and thinking is expected with age, but if this is progressing more quickly than expected, a diagnosis of mild cognitive impairment (MCI) may be given. This is often seen as an intermediate

state between normal decline and development of dementia, and although symptoms can be noticeable to those close to the individual, it generally has little impact on daily life. However, it can be very concerning to the sufferer.

"Not all cases of MCI will progress to dementia, but it is estimated that those with MCI have a three to five times higher chance of developing some form of dementia. This may be due to the fact that some cases of MCI may actually be the very early stages of dementia. However, there are a number of other causes which may impact on cognition and memory:

■ **Medications** – several groups of drugs, including anti-depressants, non-steroidal anti-inflammatories (NSAIDs) and corticosteroids may cause cognitive impairment.

■ **Thyroid disorders** – both hypo- and hyperthyroidism appear to impact cognitive function, possibly due to the effects on neurotransmission and oxidative stress.

■ **Autoimmune conditions** – including rheumatoid arthritis (RA), systemic lupus erythematosus (SLE) and systemic sclerosis/scleroderma are associated with cognitive dysfunction and decline. This has been attributed to a combination of increased inflammatory compounds, side effects of medications and psychological effects, such as stress or depression, which can accompany chronic conditions. There may also be disease specific pathways.

■ **Infections** – the immune response and associated increase in inflammatory compounds can cause a reduction in cognitive function.

■ **Sleep disorders** – insomnia, broken sleep and the use of sleep-inducing medications appears to be associated with cognitive decline.

■ **Menopause** – 44-62 per cent of perimenopausal women mention 'brain fog' or cognitive issues as a major symptom. Several markers of cognitive

ability decline in this period and appear to be linked to changes in follicle stimulating and luteinising hormones and oestrogen.

■ An emerging cause of MCI and cognitive issues is long-Covid, with up to 81 per cent of those diagnosed reporting 'brain fog' as an ongoing symptom."

Drake continued: "Cognitive decline is a multifaceted condition and many different pathway dysfunctions contribute to onset and progression; nutrition plays an essential role in protection. Blood sugar regulation is incredibly important; it is thought that the brain becomes insulin resistant approximately 20 years before the onset of dementia symptoms.

"Also, there are many nutrients that are fundamental to normal brain health and can be lacking in the population. These include the B vitamins, which are required for nerve transmission and neurotransmitter production, particularly B6, folate and B12. Omega 3 fatty acids, in particular DHA, are utilised by the brain and are essential for normal cognitive function and cell membrane health. Other nutrients include vitamin D (deficiency can be common), zinc, magnesium and antioxidants such as vitamins A, C and E, glutathione and polyphenols, but this list is not exhaustive. The health of the gut should also be considered as there is strong communication between the gut, its microbiome and the brain."

And Gorman suggested: "Women are more likely to develop Alzheimer's disease than men. Indeed, a woman's chance of developing Alzheimer's is now greater than her chance of developing breast cancer. Epidemiological studies indicate people with type 2 diabetes have a 65 per cent increased likelihood of cognitive decline. Some even consider Alzheimer's to be 'type 3 diabetes', as growing evidence supports the concept it is a metabolic disease, which may be mediated by improving the insulin response in the

brain, glucose utilisation, and energy metabolism.

"Genetics, such as the hereditary APOE-e4 variant, can increase the risk of developing Alzheimer's disease. But it is always worth remembering while genetics sets the stage for brain health, there are many diet and lifestyle interventions which can help improve and maintain cognitive fitness."

Rachel Bartholomew, Nutritionist at Nutri Advanced, turned her focus on the mitochondria.

"Once considered to be the powerhouse of the cell, mitochondria are now better known as the ultimate orchestrators of cellular health. In recent years, our understanding of how crucial these cellular organelles are for every aspect of our health has expanded significantly and brain health is no exception," she explained.

"Whilst an average cell may contain a few thousand mitochondria, each neuron will typically contain a staggering one to two million mitochondria. The brain is energy-hungry, yet is unable to store large amounts of energy reserves in the form of glycogen. In addition, such high levels of energy production generate reactive oxygen species (ROS), which may be toxic to cells in high amounts. Neurons are highly dependent on mitochondrial function to establish membrane excitability and to perform incredibly complex processes, such as neurotransmission and plasticity.

"As a consequence of all this, the brain and nervous system is highly vulnerable when mitochondrial function is impaired, and this can have wide-ranging negative health effects. Considerable evidence now demonstrates that mitochondria-related alterations are prevalent during chronic stress and depression. In fact, anything from chronic psychological stress, fatigue, depression and anxiety to cognitive deficits, neurodegenerative decline, dementia, Alzheimer's disease, Parkinson's disease and more may be linked to impaired mitochondrial function."



ASSESSING COGNITIVE DECLINE

As a starting point, if there are any health concerns regarding a person's cognitive function, referring them to their GP is key. It's also important to note the range of symptoms that can be displayed.

"It is estimated mild cognitive impairment affects up to 20 per cent of people over 65. Symptoms include forgetfulness, poor problem-solving, or inability to find the right words. But, unlike dementia, these difficulties tend not to get in the way of day-to-day life. It can be caused by depression, low vitamin levels or thyroid problems, and does not necessarily lead to dementia," Gorman

commented.

"Early indicators of cognitive decline include forgetfulness, poor problem-solving, inability to find the right words, difficulty understanding instructions or directions, and feeling overwhelmed about making decisions and plans. These symptoms of mild cognitive impairment are believed to affect between 10-20 per cent of people over 65, difficulties tend not to get in the way of day-to-day life but can be noticed by family and friends. For some people, the symptoms may get worse and develop into dementia."

Phil Beard, Technical Educator at Viridian Nutrition, also advised: "Neuroscience has developed greatly in the last 50 years and what we know about the brain is fascinating. With that, we also have a greater understanding of cognitive impairment and what can go wrong with the brain. Cognition is the process of managing high level intellectual processes that include memory, knowledge, planning, decision making attention, reasoning, judgment, perception, language and spatial awareness.

"Now, the most well-known cognitive issue is

Alzheimer's disease, but cognitive abnormalities can range from anything that significantly impairs or prevents any of the aforementioned in an individual's daily behaviours without treatment!"

Nunn added: "Dementia is a condition whereby we experience a decline in cognitive function and general brain abilities. Symptoms include a loss of memory, thinking speed, mental agility, judgement, language and understanding. With those changes, there is sometimes a gradual loss of interest in life, experiencing hallucinations, loss of independence and ability and interest in socialising."

BRAIN HEALTH PROTOCOL

Given the risk factors related to cognitive decline, there are many approaches that should be included in a programme designed to support the brain.

Drake suggested: "Choose a low glycaemic load and wholefood diet, high in vegetables, lean protein, and healthy fats. Plant-based foods are high in polyphenols, which have shown to support the microbiome and cognition by the production of short chain fatty acids. Choose a wide variety of colours of plant-based foods to obtain a diversity of different polyphenols and other phytonutrients.

"It's important to avoid heavily refined or processed carbohydrates and fats, which are pro-oxidative and contribute to poor blood sugar regulation and inflammation. It is recommended to consider avoiding gluten if you are concerned about cognitive function. Research suggests gluten can contribute to increased permeability of the gut and brain, increasing inflammation, which can be a driver of cognitive decline.

"Stress can be a driver of cognitive decline and high levels of cortisol has been shown to shrink the hippocampus, which is critical for memory and learning. Sleep is fundamental to the

brain's cleaning processes, memory storage and attenuating inflammation, to name a few. Hence relaxation and good sleep hygiene practices are a must. Exercise, socialisation and brain stimulation are all things which are associated with good cognitive health, especially as we age."

Bradshaw went on: "Nutrition is key for supporting brain health and function and a diet low in sugar, processed foods and other pro-inflammatory foods may protect against cognitive decline. Excess amount of sugar forms toxic compounds in the body called Advanced Glycation End Products (or AGEs), as well as increasing insulin beyond a safe level (resulting in inflammation and other detrimental outcomes). AGEs lead to arterial damage and are thought to be directly correlated to the development of Alzheimer's disease.

"Regular exercise regulates mood and increases brain-derived neurotrophic factor (BDNF), a molecule that enables the brain to process new information and enhance learning and memory. Additionally, exercise can help regulate inflammation and improve sleep (which is vital for stress management and good cognitive function)"

Bartholomew highlighted how best to support the mitochondria.

"Mitochondria do not thrive in conditions of chronic or excessive stress. And since chronic stress can promote a more inflammatory environment, this can be a vicious cycle for mitochondria. In a 2018 meta-analysis of 23 studies on mitochondria and anxiety, 19 studies demonstrated significant adverse effects of psychological stress on mitochondria. And the other four studies noted changes in mitochondrial function or size in response to stress³," she commented.

"Multiple studies have demonstrated improved stress response, anti-depressant and anti-anxiety effects of magnesium supplementation.⁴⁻⁶ High levels of zinc are found in the hippocampus in the brain. It is likely zinc deficiency excessively excites glutamatergic neurons in the hippocampus after exposure to acute stress, which can negatively impact mitochondria. There is strong evidence that depression is accompanied by lower serum zinc.⁷⁻¹⁰ Glutathione has a key role to play in protecting brain mitochondria. It is notable that major depressive disorder is usually accompanied by a decrease in

antioxidant enzyme activities (such as glutathione peroxidase) and total antioxidant capacity. In a 2017 study, researchers found adolescents with depression had lower glutathione levels.¹¹ Our bodies are able to make glutathione from the amino acids, cysteine, glycine and glutamic acid. It is key, therefore, to include good protein sources in the diet."

Briggs also advised: "Taking part in activities such as mentally demanding work, leisure activities (such as reading, crosswords and sudoku, playing an instrument or learning a new language) and social activities (such as visiting the theatre, dancing and participating in group activities) are associated with reduced risk of cognitive decline. Other lifestyle choices can increase risk of MCI and progression to dementia. Cigarette smoke decreases vasodilation, via the reduction of nitric oxide and increases inflammatory compounds such as cytokines."



MED DIET FOCUS

One dietary style that has been subject to much positive research generally, but specifically around the brain, is the Mediterranean diet.

"We know that eating healthily contributes to a healthy heart and healthy mind. Research shows that switching to a Mediterranean type of diet, may help to reduce the risk of developing dementia. In other words, eating plenty of nuts, seeds, avocado, oily fish and white fish, olive oil and plenty of antioxidants derived from colourful fruits and vegetables," Nunn advised.

"Swapping fats from saturated and trans-fats to an intake of polyunsaturated and mono-unsaturated fats is associated with a lower risk of developing dementia (Morris, 2004). Replace deep fried food; processed foods which can contain trans-fats and cut down on the saturated fats like butter and ghee. DHA helps maintain normal brain function with a daily consumption of at least 250mg. A serving of salmon fillet can provide up to 240mg."

Bradshaw continued: "Researchers have studied the effects of diet on cognitive decline and one diet that is recognised as being protective to cognitive function and to encourage the slowing of deterioration is the MIND diet. This nutritional approach combines the Mediterranean diet and the DASH diet and stands for the Mediterranean-DASH Intervention for Neurodegenerative Delay.

"The MIND diet emphasises consumption of berries, green leafy vegetables, nuts, olive oil, fish, beans, poultry and whole grains. One glass of wine daily is also suggested, preferably red, to benefit from the resveratrol that it contains. A recently popularised innovative approach to managing cognitive decline (specifically Alzheimer's disease) is known as the Bredesen Protocol. Pioneered by Dr Dale Bredesen (an esteemed neuroscientist/neurologist), it involves implementing a nutrient-dense, plant-rich, mildly ketogenic diet to support brain health by reducing inflammation, improving vascular health and detoxification. Lifestyle factors are central to the protocol and include exercise, sleep, stress management, brain training and nutritional supplementation. The protocol is aimed at not only those with existing cognitive decline but is also positioned as a



preventative strategy."

Gorman went on: "Epidemiological studies suggest the Japanese, Mediterranean and DASH diets, which have been shown as protective of other chronic illnesses, such as heart disease, and blood pressure, are associated with a lower risk of cognitive decline. The emphasis is on natural plant-based foods, with limited animal and high saturated fat. It specifies the consumption of whole grains, nuts, berries, and vegetables, especially leafy greens and fish. A study has shown the diet lowered the risk of Alzheimer's by as much as 53 per cent for those who stuck to it rigorously, and by about 35 per cent in those who followed it moderately.

"Long-term research in Finland, following a group aged between 60-77, showed switching to a diet high in vegetables, fruit and fish, but low in sugar, combined with exercise and brain training, improved and maintained cognitive function. The intervention involved a diet encouraging high consumption of fruit and vegetables, less than 50g of sucrose a day, and at least two portions of fish per week. Fish oil supplements were recommended for participants not consuming fatty fish and vitamin D supplementation (10-20 µg/day) was also advised. The results found those in the intervention group had improved or maintained cognitive function over time, from 25-150 per cent better than the control."

Briggs went on: "Polyphenols have been shown to reduce oxidative stress, to have protective effects on the neurons of the brain and may improve neuroplasticity. Specific polyphenols, such as those found in cocoa, red wine, green tea and citrus fruits have been shown to improve cognitive function in the elderly. A Mediterranean diet is considered to be one of the most useful for heart and circulatory health, which will ultimately play a significant role in brain function as well. Several studies have specifically examined the link between this diet and cognitive function and found there to be a positive correlation between the two; those adhering to the Mediterranean diet showed improvements in cognitive function, prevention of cognitive decline and improved scores on function tests."

FAT FINDING

Supplements in certain areas are key to top up levels from food. One of these in relation to brain health is essential fats.

Gorman advised: "Omega 3 fatty acids found in oily fish, nuts and seeds, are critical for cognitive function. Don't forget the brain is 60 per cent fat. Brain cells need omega 3 in their membranes to help communicate with other cells. Multiple studies show reduced levels of omega 3 are associated with increased risk of cognitive decline. Dietary consumption or supplementation appears to protect against dementia."

Briggs added: "Fats contribute to the production of leukotrienes and prostaglandins, which act as chemical messengers, they ensure the myelin sheath around nerves cells is intact and allow nervous impulses to be transmitted and will allow the neurons and their cell membranes to function correctly. As the brain ages, changes in lipids in the brain can lead to a reduction in the release of neurotransmitters and changes in membrane function, which affect cognitive function. One of the most important nootropic nutrients is docosahexaenoic acid (DHA), which can be found in algae and oily fish. This fatty acid is almost impossible to make from dietary intakes of alpha linolenic acid, the parent compound of the omega 3 group.

"Studies suggest to obtain 250mg of DHA required per day for normal brain function, according to EFSA, an

individual would need to consume 12.5-50g (12,500- 50,000mg) of flax seed oil. DHA is the main fat found in brain tissue and has different roles to play in improving brain function and cognition. Omega 3, and DHA in particular, should be supplemented with, particularly if the diet is plant-based or the main source is from foods such as nuts and seeds, as the conversion of the fats in these to DHA is extremely poor. Fish, krill or algae oils providing at least 250mg of DHA have been shown to improve volume of grey matter in the brain, as well as overall working memory performance. A study published this year has also shown that the effect of B vitamins on cognitive decline is affected by omega 3 status and the better the intake of omega 3s, the better the results of B vitamin supplementation were."

Nunn added: "Many people choose not to eat optimal amounts of oily fish on a weekly basis, so a daily supplement containing omega 3 fatty acids in the form of DHA and EPA derived from deep sea fish such as sardines and anchovies would help bridge the gap and prevent omega 3 deficiency. DHA helps to maintain normal brain function with a daily consumption of at least 250mg. DHA is thought to play a role in the communication between brain cells. A recent clinical study of over 200,000 participants found evidence linking fish oil supplement use with dementia prevention, with a lower risk of all-cause dementia among those aged 60-73."

COGNITIVE SUPPORT

There are key supplements that could be built into an effective protocol, depending on need, age and dietary status of a client.

"It is fundamental to obtain optimal levels of all nutrients to support cognitive health as they all work synergistically and on many different aspects of physiology. It is difficult to obtain these levels from even the healthiest diet alone," Drake pointed out. "We refer to the difference between optimal levels and those obtained from the diet as the nutrition gap. So, the first step is to bridge the nutrition gap with a good quality multivitamin and mineral with nutrients in the most bioavailable, bioactive form.

"There is now a strong understanding that the gut and brain have close communication and the health of both are intrinsically linked. The microbiome within the gut can signal the brain by different mechanisms but mainly via activation of the vagus nerve. Research into live bacteria (probiotics) has demonstrated beneficial effects on disorders such as memory loss, depression and anxiety. Therefore, I would recommend a multi strain probiotic."

Other key supplements to keep in mind includes B vitamins.

"Elevated homocysteine levels have been associated with the development of brain atrophy and dementia. Alongside adequate omega 3 intake, homocysteine-lowering B vitamins may be beneficial for elderly people suffering from mild cognitive impairment," Nunn commented. "Vitamin B12 deficiency is known to cause poor memory and concentration. Damage to the nervous system can develop in chronic cases."

Briggs added: "B vitamins are some of the most important nutrients for brain health. B6, B9 (folate) and B12 are considered to be important for the methylation cycle and, therefore, homocysteine regulation. Homocysteine is an amino acid naturally found in the body as part of the methylation cycle,

which produces methionine, cysteine and SAMe. Body levels of homocysteine are normally low due to it being an intermediate product in the processes involved in methylation but in some circumstances, homocysteine levels can be raised, and the most common reasons are linked to vitamins B6, B12 and folate. Gene mutations affecting methylene tetrahydrofolate reductase (MTHFR) are relatively common, affecting up to an estimated 40 per cent of some populations and these prevent the methylation of the aforementioned B vitamins and therefore inhibit the recycling of homocysteine and allow it to build up.

"CoQ10 supports the production of energy and decreases as we age. CoQ10 appears to reduce inflammation and act as an antioxidant, as well as having effects on the dilation of blood vessels, via production of nitric oxide. Decreases in CoQ10 and the resulting increase in oxidative stress causes declines in attention and executive function (which defines the ability to plan, focus attention, remember instructions, and juggle multiple tasks successfully) and depleted CoQ10 levels are associated with cognitive impairment. Supplementation with the reduced form of CoQ10, ubiquinol, appears to reduce endothelial cell damage (which can lead to constriction of blood vessels) and inflammation, which may improve MCI."

Bradshaw also advised: "Certain nutrients may counteract the considerable damage caused to the brain by oxidative stress. Research has focused predominantly on vitamin C, vitamin E and beta-carotene, although nature provides a vast array of antioxidant compounds including flavonoids, phenols, polyphenols and other carotenoids. Resveratrol, a compound in grapes, red wine and many other plant foods, has been extensively researched for its role in modulating the ageing process, including cognitive protection. It is thought this antioxidant may curb development of inflammatory metabolites within the brain and



protect the integrity of the blood brain barrier."

Gorman highlighted the sunshine vitamin: "The brain is full of receptors for vitamin D and deficiency has been linked to cognitive impairment. It is relatively well established that patients with Alzheimer's disease often present with lower concentrations of circulating 25(OH)D. Studies show it may help reduce amyloid-induced cytotoxicity and inflammatory responses in neurons."

Bartholemew added: "Cysteine is often regarded as the rate-limiting amino acid in glutathione production; supplementation with N-Acetyl Cysteine (NAC) may therefore help support this process.

And Briggs pointed out: "It is important, regardless of specific diet followed, to consume adequate levels of high-quality protein, to ensure a consistent and sufficient supply of amino acids. Of particular relevance are tryptophan, required for production of serotonin, melatonin and

acetylcholine. Tyrosine is involved in production of dopamine, which is closely associated with learning. Tyrosine supplementation seems to be particularly useful for cognitive function during periods of stress.

"L-Carnitine is a useful nutrient for the function of the mitochondria. It is involved in the transport of fatty acids across the mitochondrial membrane and also transports toxins out of the mitochondria, enhancing mitochondrial function and reducing dysfunction. The exact mechanisms of action are unclear but may be linked to influencing cholinergic activity, synaptic stimulation, stabilizing cell membrane fluidity, reduction of oxidative stress, inhibiting excitotoxicity and antioxidant activity."

Beard suggested: "Nutrients like magnesium, zinc, beta carotene and turmeric can help regulate our cardiovascular system, providing antioxidant ingredients and anti-inflammatory mechanisms that help us clear waste material in the brain and improve the redox status of the brain."

BETTER BOTANICALS

There are a range of botanicals known to be supportive of brain function.

“One of the main herbal products studied for cognitive function is ginkgo biloba extract. As a plant material, it has antioxidant properties which may help to protect the brain and neurons, but it also appears to improve the flow of blood, and therefore other nutrients and oxygen to the brain, via its effects on vasodilation and platelet aggregation,” Briggs explained. “It also appears to have neuroprotective effects, most likely linked to the effects on free radicals and oxidative stress, effects on apoptosis and also increases choline uptake by the hippocampus.

“Rosemary has a long history of use for memory and is traditionally used for remembrance. Again, as a plant, it will have compounds such as rosmarinic acid, which exert antioxidant effects in the body. It also appears to have a neuroprotective effect on dopaminergic neurons, which may be directly linked to memory and learning.” Ashwagandha, an Ayurvedic herb, has antioxidant, anti-inflammatory and neuroprotective effects, as well as decreasing the breakdown of acetylcholine. The withanolides in this herb have been shown to improve memory, executive function and information processing speed.

“Sage is another culinary herb considered to have significant effects of brain health and cognitive function. As a plant, it will be rich in polyphenols, which have antioxidant properties, and these include rosmarinic acid and caffeic acid. It is a combination of all of the polyphenols which appear to give sage a wide range of benefits for brain health including the reduction of inflammation, depression and anxiety. One of the most widely studies and significant effects of sage on brain health is the effect it has on

acetylcholine, one of the neurotransmitters involved in learning, memory, attention and cognitive function.

“Finally, lemon balm (*Melissa officinalis*) can be considered, as it contains polyphenols such as monoterpenes, triterpenes and phenolic acids amongst others. The effects seem to be linked to its antioxidant capacity which then exerts a neuroprotective effect. Studies also suggest an effect on AChE, similar to that described for sage, which increases ACh levels and longevity in the body, improving cognition.”

Nunn went on: “Curcumin is difficult to absorb when taken in the form of turmeric and used as a culinary spice. A good quality curcumin supplement can supply a potent source of this compound. Research has shown that curcumin acts on the inflammatory processes and supports a reduction in oxidative stress.”

And then there is the area around what is termed nootropics.

“Citicoline (cytidine phosphocholine) has been shown in human research to support memory, focus and concentration. Long-term, it may help maintain healthy brain function against age-related structural changes and mental decline. Choline is a building block of phosphatidylcholine, a phospholipid found in brain cell membranes. It is also a precursor of the neurotransmitter acetylcholine. It is thought that we don’t generally consume enough of this ingredient through the diet,” Nunn suggested.

“Bacopa monnieri is a traditional Ayurvedic herb that is referred to as a nootropic and it has been shown support memory and learning ability. Its active compounds, steroidal saponins, bacosides A and B, have shown positive influences on brain tissue regeneration. Bacosides may help with the age-accelerating effects of free radicals.”

MUST-HAVE MUSHROOMS

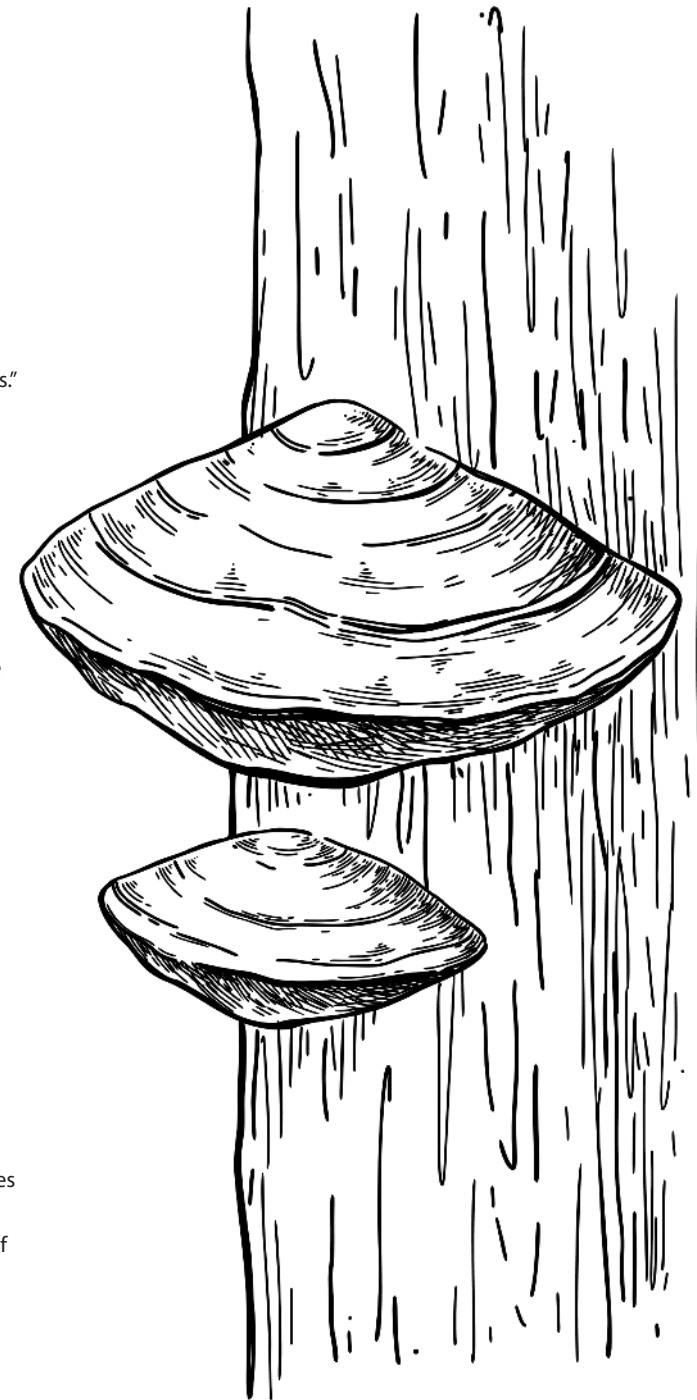
Barrett pointed towards medicinal mushrooms as a good addition to a supplement regime.

“Medicinal mushrooms are becoming increasingly recognised as powerful anti-inflammatory and antioxidant-rich tools to help manage neuro-inflammation,” she explained. “Medicinal mushrooms have a range of actions that are applicable when addressing brain health and is important to find a certified organic medicinal mushroom supplement with a standardised amount of bio active compounds.”

In terms of the specifics, she added: “Lion’s mane (*Hericium erinaceus*) is a medicinal mushroom with diverse pharmacological activities in the prevention of many age-associated neurological dysfunctions, including Alzheimer’s disease and Parkinson’s disease. Supplementation has been shown to improve cognitive function and memory in people with mild cognitive impairment and is therefore highly recommended in the treatment of neurodegenerative diseases.

“The action is based both on its ability to regenerate myelin and to regenerate new synapses thanks to its content of hericenones and erinacins, which act as NGF enhancing agents, both at the level of expression and secretion. This contribution has been shown to both prevent and slow cognitive decline and dementia, as well as show neuroprotective effects.

“Several studies and reviews have demonstrated the neuroprotective capacity of *Ganoderma lucidum* (reishi) as well as its preventive and therapeutic effect on neuronal damage and cognitive impairment. Other studies have demonstrated the antioxidant effect of *G. lucidum*, concluding that, thanks to the ability of its active ingredients to scavenge free radicals, it may enhance the reduction of age-related oxidation linked to cognitive function decline.”





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EXPERT ADVICE

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



What is bromelain and why is it used as a supplement?

ROSE HOLMES ADVISED: Bromelain is a naturally-occurring proteolytic, fibrinolytic and mucolytic enzyme found in pineapple stem. It has potent anti-inflammatory and anti-swelling activity. Its mucolytic effect means bromelain can thin nasal secretions regarding sinusitis, bronchitis, pneumonia, and allergies. Its fibrinolytic effect means bromelain can help break up and prevent the formation of clots and arterial plaque. Its proteolytic activity means bromelain can improve digestion as well as reduce inflammation and help regarding arthritis.

Bromelain is also useful for reducing healing time and pain after surgery or injury and is particularly effective regarding swelling and inflammation after sinus, dental and ENT (ear, nose and throat) surgery. Use bromelain in protocols for joint pain, arthritis, tendinitis, sprains, strains and muscle injuries.

Bromelain is also excellent to use alongside quercetin in protocols for sinusitis, hay fever and histamine-related conditions. Bromelain increases the absorption of quercetin (a polyphenolic flavonoid that acts as a natural antihistamine, reducing allergic response and stabilising mast cells). Together, quercetin and bromelain can reduce inflammation, inhibit histamine, break up mucus and are thus useful in reducing the symptoms of allergic reaction and hay fever.

Allergy and hay fever are highly prevalent conditions, with 21m adults in the UK having at least one allergy

and one in five having hay fever, so practitioners will find bromelain is extremely useful for adding (alongside quercetin) to protocols for these histamine-related atopic conditions and to any protocol where quercetin is used.

Bromelain is also useful for adding to protocols to address some types of infection. Bromelain's proteolytic and fibrinolytic properties also mean that it can dissolve the fibrous matrix of biofilms, which makes this enzyme useful alongside antimicrobials for protocols addressing (particularly) bacterial and fungal infections where biofilm may challenge eradication of the infection. Examples include *Borrelia* infections in Lyme disease, *Candida* infections (thrush, yeast infections) and in periodontal diseases affecting the oral cavity.

A 2016 study (looking at *Staphylococcus aureus* biofilm) found that bromelain, papain and alpha-amylase reduce biofilm biomass by 98 per cent, 98 per cent and 97 per cent respectively, so a supplement containing these three enzymes would be an excellent choice for adding to protocols to address biofilm problems.

Bromelain supplement strength is determined by how much protein the enzyme can digest and measured as gelatin dissolving units (GDU). Look for a product with high GDU (for example, 2500 GDU). For improving digestion, take bromelain alongside food. For anti-inflammatory, mucolytic, and fibrinolytic effect, take bromelain away from food.



ABOUT THE EXPERT

Rose Holmes, BSc (Hons), Dip.ION, PGCE, mBANT, CNHC is a Registered Nutritional Therapist with a special interest in chronic illness, circadian rhythm disruption and healthy ageing. She is the Education and Training Manager at Rio Health and provides training to other practitioners and health professionals on natural therapies. Rose is the author of the book, *Oral Health and Systemic Disease: A Clinical Guide for Nutritional Therapists and Functional Medicine Practitioners*.



What is the andropause and what approach can I take when advising a client who is experiencing it?

HELEN DRAKE EXPLAINED:

Andropause is characterised by a gradual drop in the production of testosterone, usually in males over the age of 50, leading to symptoms, including reduced libido, increased muscle loss, fat gain, depression, low energy, irritability and mood swings.

The rate of decline and severity of symptoms varies in different individuals and can be affected by many factors, either in addition to age, independently, or collectively. These include poor sleep, chronic stress, medications, excessive alcohol intake, disease, obesity, and poor diet. Nutrition interventions can be important at this time.

The production of testosterone and its signalling pathways have many complex steps and require adequate nutrient levels to facilitate. Processed and refined foods have been stripped of many important nutrients and so adopting a diet which is rich in wholefoods, fruits and vegetables is recommended. You can support a nutrient dense diet with a good quality multivitamin and mineral to ensure you are bridging the gap between intake and optimal needs. Nutrients to support testosterone levels include:

■ **Zinc** – important for the maintenance and health of the testes, as well as normal testosterone production. It also helps prevent testosterone from being converted into oestrogen. Suboptimal volumes of zinc appear to have a negative influence on serum testosterone concentrations, as well as on seminal volume.

■ **Vitamin B6** – necessary for testosterone

production and also supports adrenal function and neurotransmitter production.

■ **Vitamin D** – a study confirmed previously observed positive associations between circulating vitamin D and total and free testosterone levels before and after administration of vitamin D supplementation. It demonstrated that vitamin D deficiency is associated with a significant reduction of testosterone.

■ **Omega 3 fatty acids** – help to maintain and increase testosterone levels. They also play an essential role in reducing inflammation and promoting normal cognitive function

Obesity and insulin resistance is strongly associated with an increase in andropause symptoms. Therefore, weight loss and improvements to insulin sensitivity may be important, such as combining healthy fats, lean protein and fibre.

Oxidative stress and inflammation play a role in damage to Leydig cells, which produce testosterone. Therefore, anti-inflammatory (curcumin and omega 3s) and antioxidant (vitamins A, C, E, zinc, selenium and phytonutrients) interventions are useful. Anthocyanin supplementation has shown promise as an effective therapy.

Supporting adrenal function and managing stress can also support normal testosterone production. B vitamins, vitamin C, magnesium and zinc are important nutrients for the adrenals. Interventions to support stress, sleep and also taking regular exercise are essential to wellbeing during the andropause.



ABOUT THE EXPERT

Helen Drake Bsc (Hons), Dip Nutritional Therapy, mBANT, rCNHC, AFMCP joined Cytoplan in June 2016 as Nutritional Therapist based in the South East, who offers tailored expert advice to all Cytoplan customers and support to practitioners and students. As a BANT and CNHC Registered Nutritional Therapist, Helen worked in private practice in both South East London and Kent and has worked with clients suffering from a wide range of conditions, including fertility and hormonal imbalances, digestive issues, skin conditions, arthritis and weight management. In September 2012, Helen also began as lecturer at the College of Naturopathic Medicine in both London and Brighton.

A guide to probiotics

Naturopath, Ben Makeham, guides readers through the latest developments in probiotics.

As medical science unravels the complex relationship between our gut microbiome and human health, there is an emerging role for the use of clinically researched probiotics to tangibly improve human health.

Probiotics are live microorganisms that, when administered in adequate amounts, improve human health by interacting with our physiology in beneficial ways. Different strains of probiotic bacteria have different biological actions within the gut due to their varying genetic makeups, and each strain offers different health benefits. While the most well-known benefits of probiotics relate to their ability to support the health of the digestive tract and immune system in otherwise healthy people, specific strains of probiotic bacteria are now known to target aspects of human health well beyond the gut and are becoming increasingly clinically relevant.

PROBIOTICS IN HUMAN HEALTH AND DISEASE

Scientific evidence continues to demonstrate that the gut microbiome is its own functional organ system within the human body. Humans live in symbiosis with their gut microbiome: the human colon provides a reliable food source and a favourable environment for microorganisms to live within, and the biochemical functions of these microorganisms help to maintain human health¹.

When the gut microbiome is healthy, its effects on human health are beneficial. However, just like any other organ, the gut microbiome can become 'diseased' and negatively impact an individual's health. This is referred to as gut dysbiosis and it has been implicated in many chronic systemic diseases, including depression, asthma, osteoporosis and countless others².

In states of dysbiosis and when carefully selected, probiotic microorganisms can help to temporarily introduce beneficial microbial functions into the gut microbiome in order to improve health. Probiotics can influence many different aspects of human health. For example, their metabolic by-products are absorbed like nutrients and travel around the body, influencing our health in many different ways. Likewise, interactions between the cells that make up the gastrointestinal tract and the probiotic microorganisms can change the way that the nervous system, immune system and endocrine system function³.





SELECTING THE RIGHT PROBIOTIC

Not all probiotic microorganisms offer the same health benefits. This is because different probiotic strains, even within the same species, perform very different functions in the human gastrointestinal tract and, as a result, offer vastly different health benefits⁴.

WHAT IS A PROBIOTIC STRAIN?

As in the animal kingdom, probiotic bacteria are classified according to families, genera, and species. There are over 24 different species in the bacterial genus *Bifidobacterium*, such as *longum*, *infantis* and *breve*. When the bacteria within a single species still exhibit significant differences, they are further classified as individual strains, such as *Bifidobacterium breve* BR03 or *Bifidobacterium breve* B632.

The actions of a specific probiotic strain can only be ascertained through vigorous clinical research. Valuable insights into their actions are provided by metagenomic sequencing or investigations

through in-vitro and in-vivo studies. Human clinical trials provide the highest level of evidence for the therapeutic applications of particular strains by helping to identify the positive health outcomes associated with their supplementation, and oftentimes investigate potential mechanisms of action associated with these outcomes.

Consider the bacterial species *Lactobacillus salivarius*: in-vivo studies demonstrated that the strain *Lactobacillus salivarius* LS01 stimulates the immune system in a way which favours the T-helper 1 (Th1) lymphocyte response and reduces T-helper 2

(Th2) lymphocyte inflammation, while *Lactobacillus salivarius* BNL1059 favours the Th2 response. When *Lactobacillus salivarius* LS01 was then selected for a subsequent human clinical trial to investigate its ability to relieve symptoms of atopic dermatitis by reducing T-helper 2 lymphocyte inflammation, significant reductions in symptom severity were observed⁵.

For more targeted effects, it is essential to review the evidence and select probiotic strains that have been shown to target disease processes relevant to the health concern being addressed.



FACTORS CONTRIBUTING TO PROBIOTIC STRAIN VARIABILITY

The genetic variation between different strains of the same species of probiotic bacteria can be as significant as the difference between a human and a lemur⁶. This variation, seen in both structural and functional characteristics, creates significant differences in their actions within the gut.

■ Metabolite production:

Different probiotic strains each have a capacity to produce different metabolites, many of which are by-products of fermentation and enzymatic breakdown of different substrates, including a diverse range of fibre, lipids, proteins and polyphenols. Metabolites are absorbed into systemic circulation, like nutrients, and change the function of many different cells and organ systems. The metabolites a probiotic strain is able to produce is determined by their genome, and this gives rise to strain-specific actions. Some examples include extracellular proteins, short-chain fatty acids, indole, bacteriocins, hydrogen peroxide, and nitrous oxide⁷.

Lactobacillus salivarius LS03, another distinct strain from this species, was found to directly inhibit the key bacteria known to exacerbate acne lesions, *Cutibacterium acnes*, via the production of bioactive

antimicrobial bacteriocins⁸. In a subsequent human clinical trial, this strain was found to help significantly relieve the symptoms of acne⁹.

■ **Surface proteins:** Different probiotic strains also possess different surface proteins which interact with the gut epithelium and its components. The surface layer lattice of a probiotic bacterium contains various components which constitute a unique microbial-associated molecular pattern (MAMP). These components will interact with various pattern recognition receptors (PRRs) on epithelial and immune cells, such as toll-like receptors, and trigger molecular signalling cascades that change cellular behaviour. Examples of various surface proteins include flagella, pili, capsular polysaccharides, lipoteichoic acid lipopolysaccharides¹⁰.

Surface proteins, determined by genetic makeup, give rise to another layer of strain-specific effects. For example, *Lactobacillus rhamnosus* GG has proteinaceous protrusions of its cell surface called SpaCBA pili, which gives this probiotic strain an excellent ability to adhere to mucus and epithelial cells, allowing it to persist longer in the human gut and facilitate closer interactions with the host¹¹.

SELECTING APPROPRIATE THERAPEUTIC DOSES

Therapeutic doses for probiotics are determined by clinical research and will differ for each probiotic strain and the health concern being targeted.

Dosing should be informed by those that were found to be therapeutic within clinical research as research demonstrates that more is not necessarily better. For example, clinical trials conducted in adults with irritable bowel syndrome have shown that a dose of 10bn live bacteria of the probiotic, *Lactobacillus plantarum* 299v can help to relieve symptoms¹². The same strain and dose was found to help improve iron absorption¹³.

ENSURING PROBIOTIC VIABILITY

Probiotics are living microorganisms that can be killed by adverse environmental conditions during storage, including exposure to moisture before administration. This can occur if a probiotic product is not packaged or stored appropriately.

Further, probiotics need to be able to survive the harsh conditions in the upper gastrointestinal tract, including stomach acid, to reach the large intestine alive, where they exert their beneficial effects. This is often achieved through specialised delivery technologies, such as microencapsulation or enteric-coated capsules.



Ben Makeham is a qualified naturopath (BHSc Nat), having studied in Melbourne Australia,

and is currently Science & Research Communications Manager at Activated Probiotics. Ben is a strong proponent of evidence-based complementary medicine, with a special interest in novel therapeutic applications of the gut microbiome and live biotherapeutics.



Leading the way in R&D

Hifas da Terra prides itself on its investment in research and development, leading the way in bringing new ingredients to the medicinal mushroom category. Here, the company explains its plans for the future.



The nutritional supplements market is a busy one these days, with many brands bringing ranges to market that claim to be better than the last. Where Hifas da Terra sets itself apart is the huge investment it makes in research and development, in demonstrating its products are efficacious, and of high quality.

And there are many ways that this innovative company, which specialises in medicinal mushrooms, is demonstrating this.

Sophie Barrett is Mycotherapy Advisor at Hifas da Terra UK and Ireland and explained: "We have been working on exclusive ingredients and Hifas

da Terra patents, as well as developing new technology, with more than 40 in-house and collaborative projects underway. Improving people's health with organic products, which respect nature and the functioning of the body that meet and exceed the demands of quality, safety and efficacy, is our priority.

"We have an immense collection of medicinal mushroom strains housed in the Hifas Mycological Bank (one of the largest strain banks in Europe, allowing us to select the most suitable strain for each development) and under the umbrella of Hifas Quality System that

follows GMP pharmaceutical standards, we are registering exclusive ingredients under patent process. For example, Hifas is the only company that uses a strain of *Herichium* with its own scientific evidence. The presentation of the patents for these exclusive ingredients in our 100 per cent natural products shows our strong commitment to investing 62 per cent of profits in research, development, and innovation, opening up an unprecedented path in the natural product sector."



R&D INVESTMENT



Looking in greater detail at the research and development focus, at Hifas da Terra, it is imperative to the company that it can demonstrate the efficacy and quality of the products.

Sophie commented: "We currently have more than 15 active clinical studies evaluating the health benefits of supplementation with our products. The most important and largest studies are two oncological clinical trials, double-blinded against placebo in 288 patients with colorectal cancer, micromarker testing our new onco product, Mico-Digest 2.0, and also 240 breast cancer patients, Microimmunomama, testing the new Mico-Mama 2.0.

"We have also just ended SIBO and detox studies with impressive results and now we are focused on DAO deficiency, a women's health project, which will include oral and topical treatment, Lyme disease, functional gastrointestinal disorders in children, and skin toxicity in breast cancer with a new topical formulation."

It is perhaps because of the focus on quality and on R&D, that has seen Hifas da Terra enjoy impressive growth.

"Hifas da Terra revenue has grown throughout the 2017 to 2021 period by 120 per cent, with a steady average year on year revenue growth of 22 per cent. Our revenues in 2022 follow these characteristics," Sophie advised.

"This growth can be tied to the public's awareness but mostly on our side, health practitioners' increased understanding of the nutritional and medicinal properties of these tied to clinical evidence. Indeed, numerous



medicinal effects of mushrooms have been reported and these include antioxidant, anti-diabetic, antimicrobial, anticancer, prebiotic, immunomodulating, anti-inflammatory and cardiovascular beneficial properties.

"Our growth is notably related to our research and development, as well as currently conducting clinical trials surrounding breast cancer, colorectal cancer, Lyme disease, long Covid, women's health, microbiota/digestive problems, diverticulitis, and SIBO, among others. Our growth is also related to the growing importance of an integrative and functional approach in health in general, the support of institutions, as well as being integral participants in the development of mycotherapy (the therapy of medicinal mushrooms applications to health)."

Research is also critical for the company when it develops new products, which is a detailed process from concept to launch.

"Formulation is a reflection of our strong R&D, which includes clinical studies, so we assure safety and effectiveness of our products," Sophie explained. "It all begins with a unique strain: Hifas da Terra has one of the largest mycological banks in Europe, which allows us to select the most suitable strain for each development. Ourselves or our partners cultivate this strain organically following strict conditions that are established in our Hifas Quality System.

"We implement state-of-the-art technologies (patent pending),



directly related to product potency and extraction yield. We are currently the only European company that manufactures fungal extracts in Spain. For example, Hifas Green Extraction process allows us to concentrate determined bioactive compounds and in addition, we minimise natural waste as we give new uses of the resulting by-products for animal feed or agriculture. Then, we perform double and even triple analytical checks on our products where we test the absence of more than 400 pesticides, heavy metals, microbiology and more."

When it comes to NPD, the company's new 2.0 Onco line is described as a revolution in terms of pharmaceutical technology and clinical efficacy.

"That's why in our new Onco 2.0 line, we wanted to take the next step in terms of bioavailability: we have proved that the combination of Hifas da Terra's extracts with one of the emulsion-enhancing ingredients offers an advantage in the absorption and bioavailability of the extract," Sophie advised.

"Mico-Repair has been updated and reformulated, an antioxidant repair serum that cares for and protects the skin. It contains reishi, cordyceps and organic CBD oil. We are also working on an interesting new line of extract and powder combinations to offer our clients, three new formulas coming at the start of 2023."

PRIDE IN QUALITY

And then if we turn to the quality factors, what is it that sets Hifas da Terra apart?

"At Hifas da Terra, the entire production process (from the selection of the mushroom strain to cultivation, through the extraction process, to the small details of the final product) is standardised in their formulas with respective bioactive compounds with the key active compounds listed on each product," Sophie commented.

"It is important to find a brand like Hifas da Terra where the production of extracts is uniform and controlled from the start following pharmaceutical GMP standards of excellence and Hifas da Terra has one of the largest private fungal stocks in Europe and continues to develop new cultivation techniques optimised to achieve standardised production with high concentration of active ingredients."

Sustainability is also important to the company and measures are being taken to really walk the walk.

Sophie added: "Hifas da Terra is an oxygen positive company, planting more than 120,000 mycorrhized chestnut trees a year. Care for the environment and sustainability is at the forefront of every decision, such as introducing 100 per cent recyclable glass containers and using only PEFC paper from sustainable forests. We also perform a unique Hifas Green extraction process using green extraction technologies, which are more sustainable and emphasise our commitment to a 360-degree approach to sustainability in every decision and manufacturing process."

And as we look ahead to future plans, this commitment to quality, and to R&D, will continue.

"As a biotech company, Hifas da Terra reinvests 62 per cent of profits into research and development into its medicinal mushrooms with standardised active compounds for immunology, gastrointestinal, mental and emotional health, and oncology, with clinical trials underway in all these areas," Sophie commented.

"We have one of the largest banks of fungal strains in Europe and select the most suitable mushroom strain for each grain-free product developed, in accordance with pharmaceutical GMP standards of excellence using non-GMO ingredients, and 100 per cent plant-based capsules, certified organic, halal and suitable for coeliacs, lactose intolerance and vegans. We are developing other exciting areas of the business beyond human health that we look forward to sharing with you soon!"



ADAPTING IN THE PANDEMIC

The pandemic placed a range of challenges on suppliers in the industry, and specifically with Hifas da Terra, the company saw greater understanding of the products.

Sophie explained: "The Covid-19 pandemic was a true awakener in the eyes of the public, with the immunomodulatory characteristics of these attracting a new crowd interested in building their defences and modulating the effects of Covid-19, allowing people to function. A new current of biohackers is actively embracing the medicinal mushrooms for their adaptogenic, cognitive support, sport performance and antioxidant properties.

"There is a lot of new research into medicinal mushrooms for their anti-viral qualities, particularly since the Covid-19 pandemic. Both reishi (*Ganoderma lucidum*) and cordyceps (*Cordyceps sinensis*) 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 (Jan JT et al., 2021, Rahman et al. 2021). Hifas da Terra has recently bought out a concentrated extract, Mico-Vir, combining the potent anti-viral synergy of both these mushrooms."

Henry Bernard, Manager at Hifas da Terra UK and Ireland, added: "We are having a more diverse than ever client base

who appreciate our rigorous production and quality protocols. Referring to an article in *Nature* magazine, a US study found 75 per cent of reishi products on the market contain only traces or no fungi at all.

"We adapted the business prioritising Covid-19 studies with our concentrated extracts range, a nursing home study and a study with individuals suffering from persistent Covid, which both provided promising results that we have shared and are in the process of sharing."

Demand has also risen hugely, and in areas in which Hifas da Terra products excel in.

"In the wider context, there has been huge demand for adaptogenic foods and nutraceuticals as stress and anxiety have increased exponentially in the wake of the pandemic, with many more people suffering from sleep issues and disturbances, as well as health challenges, such as long Covid," Sophie advised.

"Medicinal mushrooms are very useful allies in these areas, regulating the stress response, sleep cycles and reducing stress and anxiety, reishi being the number one mushroom people turn too, however, there are many culinary mushrooms that are also classed as medicinal mushrooms that we can incorporate into our diets for different beneficial effects (shiitake and royal sun mushroom)."

Goodness guaranteed

Take inspiration from these healthy dishes to add some goodness to your winter cooking.



Beetroot smoothie bowl



Celery and Parmesan minestrone



Mexican loaded sweet potatoes with asparagus



Zespri SunGold and ginger energy bars



Recipe courtesy of www.lovebeetroot.co.uk

Beetroot smoothie bowl

Serves 2

Preparation time: 5 minutes

Ingredients:

For the smoothie:

- 125g vac-pac beetroot
- 2 frozen bananas, peeled and chopped
- 200g frozen strawberries, hucked
- 150g coconut yoghurt
- 1 tsp vanilla extract

To serve:

- 1 tsp flaked almonds
- 1 tsp chia seeds
- 2tbsp granola

Method:

- Blend together the smoothie ingredients until smooth.
- Pour into a bowl and top with the almonds, chia seeds and granola.



Recipe courtesy of www.lovecelery.co.uk

Celery and Parmesan minestrone

Serves 4

Preparation time: 10 minutes

Cooking time: 25 minutes

Ingredients:

- 2tbsp extra virgin olive oil
- 300g chopped celery, leaves reserved
- 1 onion, diced
- 1 carrot, diced
- 1 clove of garlic, chopped
- 1 tsp celery salt
- Salt and pepper, to taste
- 1L vegetable stock
- 75g of orzo, or other small pasta shape
- 2 tomatoes, diced

- 1 tin of chickpeas, drained and rinsed
- 50g grated Parmesan, plus more for serving

Method:

- Heat the oil in a large saucepan over a medium heat. Add the chopped celery, onion, carrot, garlic, celery salt and some salt and pepper. Cook, stirring occasionally, until the vegetables are tender, about 10 minutes.
- Add the vegetable stock and bring to a boil. Add the pasta and cook until tender, eight-10 minutes. Add the tomatoes, chickpeas, half the reserved celery leaves and Parmesan.
- Cook over medium heat until steaming hot, three to five minutes. Ladle into bowls and garnish with the remaining celery leaves and a light sprinkling of Parmesan, if desired.

Mexican loaded sweet potatoes with asparagus

Serves 2

Preparation time: 20 minutes

Cooking time: Up to an hour, depending on the size of your sweet potatoes

Ingredients:

- 2 large sweet potatoes
- 1 x 250g bundle asparagus
- 2tbsp olive oil
- 1 small red onion, chopped
- 1tsp hot, smoked paprika
- 1tsp ground cumin
- 1 red pepper, deseeded and chopped
- 1 small tin sweetcorn, drained
- Sriracha
- Tahini
- 3tbsp chopped coriander

Method

■ Preheat the oven to 190°C. Prick the sweet potatoes all over and put on a baking tray lined with tin foil. Bake in the

oven for 40 minutes or so, until you can easily pierce with a knife. Cooking time will depend upon the size of the sweet potatoes.

■ Meanwhile, heat the olive oil in a large frying pan. Add the red onion and sauté for five minutes or so. Add the spices and cook for a further minute. Cut the asparagus into 5cm lengths. Add the red pepper and asparagus to the pan, reserving the tips, and cook for a further five minutes. Add the sweetcorn for the last two minutes to heat it through.

■ When the sweet potatoes are almost ready, put the asparagus tips on the baking sheet with the sweet potatoes, drizzle with 1tsp olive oil and roast for five-10 minutes.

■ To assemble, split the sweet potatoes lengthways, fill with the mixture from the pan. Top with the roasted asparagus tips and drizzle with a little sriracha and tahini. Add coriander on top.





Zespri SunGold and ginger energy bars

A healthier alternative to flapjacks, these don't require any cooking and make a great mid-morning snack.

Makes 10-12 bars

Preparation time: 20 minutes + setting time

Ingredients:

- 1 Zespri SunGold kiwi, peeled
- 3tbsp maple syrup
- 50g melted coconut oil
- 300g oats
- 1tbsp ground ginger
- 30g pistachios
- 30g chopped roasted hazelnuts
- 30g pumpkin seeds
- 2 Zespri SunGold kiwis, sliced
- 100g dark chocolate

Method:

- In a food processor, place the peeled Zespri SunGold kiwi and blend until smooth.
- Add the maple syrup, melted coconut oil, oats, ground ginger to the food processor and blitz until well

combined. Transfer the contents to a mixing bowl.

■ Roughly chop the pistachios and add to the bowl along with the chopped hazelnuts and pumpkin seeds. Stir everything together until well distributed.

■ Line a square baking tin with parchment paper and transfer the mix into the tin. Spread out evenly with the back of a metal spoon. Using the same spoon, make small indentations in the mix to place a slice of kiwi in each one.

■ Add the slices of Zespri SunGold kiwi to the top, then place the tin in the fridge. Allow to set for two hours.

■ Remove the tin from the fridge and slice into 10-12 bars (depending on how big/small you would like them).

■ Melt the dark chocolate in the microwave or in a small bowl over a pan of simmering water. Dunk the end of each bar in the melted chocolate and place on a piece of baking paper to cool.

■ Keep in an airtight container in the refrigerator for up to one week.



I-Mag giveaways



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

Lamberts Choline Liver Complex



Choline is a vital nutrient, closely related to the B vitamin complex and known to contribute to the maintenance of normal liver function, plus homocysteine and lipid metabolism. Lamberts Choline

Liver Complex provides 100mg of this nutrient per tablet, partnered with a comprehensive complex of the important B vitamin group, which supports the release of energy from food, in addition to the extensively studied herb, milk thistle. The tablets are made, tested and packed in the UK to ensure consistent high quality.

I:Win: We have three pots of the 60-fill size to give away.

NutraTea bundle



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I:Win: We have three to give away.



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FERTILITY PROGRAMME

The point should be made to clients that there is no quick fix when it comes to fertility, and any protocol takes time and focus.

In terms of the expectation, Bradshaw explained: "Improving fertility needs patience and time. It is commonly suggested to follow dietary and lifestyle changes for a minimum of three months. If there are long-standing hormonal imbalances, it may take even longer."

Rayner added: "I always say to my clients that expectations need to be at around six months, sometimes more depending on the complexity of their health complaints. It takes over 100 days for the follicles in the ovaries to mature and 74 days for sperm. It also takes time to support micronutrient levels, detoxification pathways and most importantly, the client's habit changes such as

dietary or self-care."

Grieshaber went on: "The UK Government recommend that when you are trying to get pregnant, consume a 400ug folic acid supplement daily for 12 weeks to help improve your chances of fertility. However, every individual is different. Therefore, it is vital to ensure all nutritional levels remain high to help support and enhance the chances of fertility. Most couples will get pregnant within a year if they have regular sex and do not use contraception. There is an estimated 25-30 per cent chance of conceiving during each monthly cycle. However, it is known that women become less fertile as they get older, but the effect of age on men's fertility is less clear."

And there are some critical factors to educate clients on that could be affecting their fertility.

"Alcohol consumption is associated with low sperm count in men and a lower rate of conception in women. Xenoestrogens are environmental oestrogens that can make their way into food and water supplies. They can be found in tap water, food and drink stored in plastic, and pesticides and herbicides. These chemicals have been shown to disrupt endocrine and hormonal balance and possibly lead to fertility issues, such as sperm abnormalities and oestrogen imbalances," Bradshaw advised.

"A high caffeine intake is associated with reduced fertility, so couples should be mindful of their intake of coffee, green tea, soft drinks and chocolate. Avoiding dietary sources of free radicals, saturated fats and trans fats will also help to maximise fertility."

Looking in closer detail at the reasons behind conception issues, Grieshaber added: "Infertility can be due to a range of reasons, but for one in four couples, a cause cannot be identified. However, an influx of studies has emphasised the contribution that the 21st century lifestyle can play to infertility.

"The influencing lifestyle factors that have been ascribed are diet, physical activity, psychological stress, socioeconomic environment, cultural factors, BMI, smoking, alcohol, caffeine, and psychoactive substances. Infertility can also be influenced by each partner's genetics, age, medication, surgical history, exposure to environmental toxins and systemic diseases.

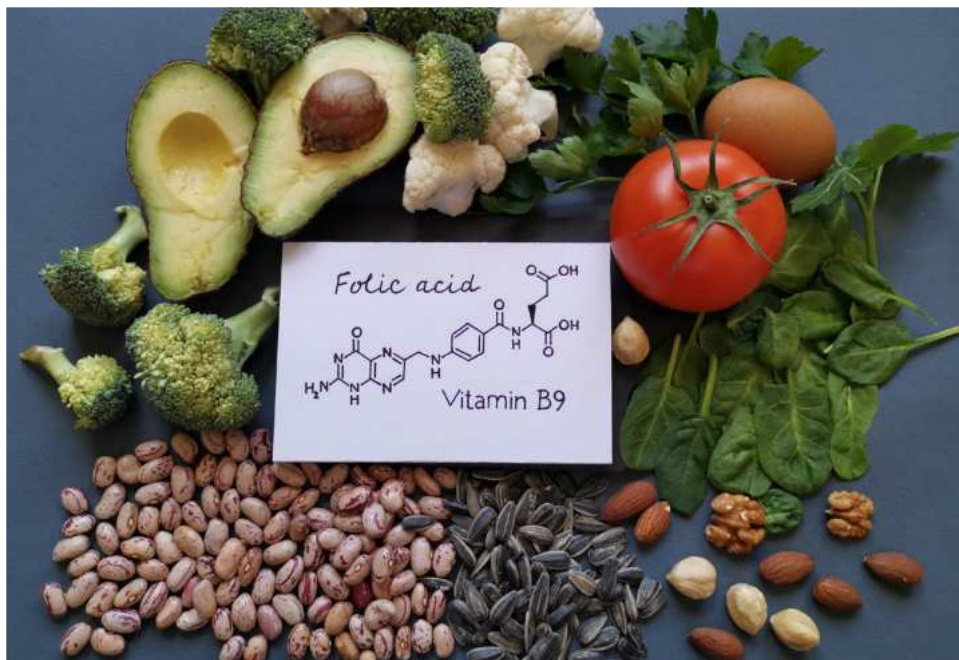
"Specifically, to women, infertility can be influenced by ovulation problems and the monthly release of an egg from the ovaries. Ovulation problems can originate from an egg struggling to be released or in frequencies of an egg being released in some cycles but not others. Ovulation problems could be a consequence of polycystic ovary syndrome (PCOS), thyroid

problems, premature ovarian failure, cervical mucus problems, endometriosis, or pelvic inflammatory disease.

"Regarding male infertility, the predominant common cause of infertility is abnormal semen. Abnormal semen could be due to a lack of sperm production, sperm not moving effectively or abnormal sperm movement. However, many cases of abnormal semen are unexplained. Another contributing factor is testicle health – if the testicles are damaged, this can contribute to the quality of semen. Some men experience ejaculation problems, which can prohibit conception."

Let's also factor in the impact stress can have.

"Modern day stress plays a huge role, it is the biggest driver that I see in my clinic. With longer working hours and burning the candle at both ends, increasing financial pressures, and modern day eating habits where there is limited time to make home-cooked nutritious meals, food is grabbed and often eaten on-the-go and in front of a laptop. People are living with often high cortisol levels, which can directly disrupt sex hormone balance. All of these factors contribute to poorer fertility," Rayner advised.



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